

# Dunellen Public Schools

# **FINAL Energy Audit Report**

Prepared For: Dunellen Public Schools

Mr. Brian P. Delucia Business Administrator Dunellen Public Schools High & Lehigh Streets Dunellen, NJ, 08812

Prepared By: Dome-Tech, Inc.

Prepared Under the Guidelines of the State of NJ Local Government Energy Audit Program

April 2014



510 Thornall Street, Suite 170 Edison, NJ 08837 Phone: 732-590-0122 Fax: 732-590-0129







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#### DUNELLEN PUBLIC SCHOOLS LGEA REPORT

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April 16<sup>th</sup>, 2014

Brian P. DeLucia School Business Administrator Dunellen Public Schools High Street & Lehigh Street Dunellen, NJ 08812

#### Re: EXECUTIVE SUMMARY FOR DUNELLEN BOARD OF EDUCATION (3 BUILDINGS) STATE OF NEW JERSEY LOCAL GOVERNMENT ENERGY AUDIT – FINAL REPORT OUR PROJECT NUMBER D13435

Dear Mr. Delucia:

Dome-Tech was retained by the Dunellen Board of Education, as a pre-qualified participant in the Local Government Energy Audit Program, to perform an energy audit. The objectives of the energy audit were to evaluate the schools' energy consumption, establish baselines for energy efficiency, and identify opportunities to reduce the amount of energy used and/or its cost.

The scope of the audit is standardized under the Program, and consisted of the following:

- Benchmarking historic energy consumption utilizing EPA Energy Star's Portfolio Manager
- Characterizing building use, occupancy, size, and construction
- Providing a detailed equipment list including estimated service life and efficiency
- Identifying and quantifying Energy Conservation Measures (ECMs)
- · Evaluating the economic viability of various renewable/distributed energy technologies
- Performing a utility tariff analysis and assessing savings potential from energy procurement strategies
- Providing the method of analyses

Based upon data received for the twelve (12) month period Jan 2013 – December 2013, the facilities included in this study had an annual expenditure of:

- Electricity: approximately 1,385,747 kWh at a total cost of approximately \$215,905
- Natural Gas: approximately 101,121therms at a total cost of approximately \$93,321

The following buildings were evaluated under this study:

Facility Name	Total Floor Area SF
Faber Elementary School	89,203
Lincoln Middle School	26,248
Dunellen High School	77,794

Please refer to Section 2 of this report for a detailed list of identified Energy Conservation Measures (ECMs), along with a summary of their preliminary economics (estimated project cost, estimated annual energy savings, applicable rebate(s), etc.). In this report, all identified ECMs are ranked and presented according to their simple payback; however, please note that the Master ECM Table can also be sorted by building, by measure type, etc.

If all identified ECMs were to be implemented, they would provide the following estimated benefits to the Dunellen Board of Education:

•	Total annual electrical savings:	Approximately 376,967 kilowatt-hours of electric Consumption; 27% of baseline
•	Total annual natural gas savings:	Approximately 18,258 Therms of natural gas consumption 18% of baseline
•	Total annual cost savings:	approximately \$76,418 of utility cost; 24.7% of baseline
•	Total annual CO <sub>2</sub> emissions reduction:	232 tons
•	Total net estimated implementation cost:	approximately \$938,791
•	Total average simple payback:	12.6 years

A summary of the projects that are recommended for implementation includes the following: Upgrading lighting and controls, CRT monitors and personal computer "plug load" controls, de-stratification fans installation and several other HVAC systems and control upgrades.

Distributed/Renewable Energy Systems were also reviewed with the following conclusions:

- Roof-mounted photovoltaic systems ranging in size from 11 kW dc to 32 kW dc (63 kW dc total) could provide approximately 4% to 9% of each building's annual energy usage (6% of total energy usage for the 3 buildings). In spite of the relatively low utility costs and low current REC (Renewable Energy Credit) prices, solar energy appears to be a viable investment option for this school district. The Board of Education may consider engaging in a PPA (Power Purchase Agreement) with a solar energy developer in order to reduce investment risks and operational burdens. Should the school district decide to pursue a solar PPA, Dome-Tech recommends commissioning a more detailed study and market analysis.
- CHP (Combined Heat and Power), Fuel Cells, and Microturbines were also considered but not recommended due to low hours of operation at public school buildings.

The schools' data was entered into the US EPA *ENERGY STAR's Portfolio Manager* Database program. Buildings with scores of 75 or higher may qualify for the *ENERGY STAR* Building Label. Dunellen Public Schools scored between 13 and 62. See the report for further information.

Regarding the procurement of utilities, Dome-Tech understands that the schools' facilities in this study are served by six (6) electric accounts behind PSE&G and three (3) natural gas accounts behind PSE&G. All major electricity and natural gas accounts were served by Direct Energy and Hess respectively, third-party retail energy suppliers, during the period analyzed in the study. It is recommended to continue evaluating third party suppliers for the lowest commodity rates.

During the development of this audit, Dome-Tech was assisted by facility personnel, who were both knowledgeable and very helpful to our efforts. We would like to acknowledge and thank those individuals especially Mr. Frank Patullo.

Sincerely,

Ersin Gercek, PE, CEM, LEED AP, CPMP Senior Energy Engineer



#### DUNELLEN PUBLIC SCHOOLS

#### ECMs - SORTED BY PAYBACK

ECM #	Energy Conservation Measures (ECM)	Buildings	Energy Savings kWh	Demand Savings kW	Energy Savings Therms	Gross Installation Cost*	Rebates/ Incentives	Avoided Cost	Net Implimentation Costs	Annual Energy Cost Savings	Annaul Oper. Cost Savings	Total Annual Cost Savings	Simple Payback	Internal Rate of Return (IRR) (Net)	Measure Life Yrs	Lifecycle Savings (NPV)	CO2 Savings Tons
1	Computer Power Management	Faber Elementary School	20,664	0	0	\$3,330	\$0	\$0	\$3,330	\$3,260	\$0	\$3,260	1.0	94%	5	\$11,184	6.9
1	Computer Power Management	Dunellen High School	13,396	0	0	\$4,620	\$0	\$0	\$4,620	\$2,081	\$0	\$2,081	2.2	35%	5	\$4,646	4.5
14	Exhaust Fan Controls	Lincoln Middle School	468	0	603	\$2,000	\$0	\$0	\$2,000	\$651	\$0	\$651	3.1	30%	10	\$3,280	3.7
14	Exhaust Fan Controls	Dunellen High School	702	0	904	\$3,000	\$0	\$0	\$3,000	\$941	\$0	\$941	3.2	29%	10	\$4,634	5.5
14	Exhaust Fan Controls	Faber Elementary School	1,170	0	1,506	\$5,000	\$0	\$0	\$5,000	\$1,558	\$0	\$1,558	3.2	29%	10	\$7,637	9.2
1	Computer Power Management	Lincoln Middle School	1,354	0	0	\$780	\$0	\$0	\$780	\$226	\$0	\$226	3.5	14%	5	\$226	0.5
13	Demand Controlled Ventilation	Lincoln Middle School	7,409	0	675	\$8,000	\$0	\$0	\$8,000	\$1,878	\$0	\$1,878	4.3	22%	15	\$12,879	6.4
3	Lighting Equipment Upgrade	Faber Elementary School	78,151	33	0	\$70,570	\$13,880	0	\$56,690	\$12,330	\$0	\$12,330	4.6	20%	15	\$80,398	26.0
3	Lighting Equipment Upgrade	Lincoln Middle School	20,801	7	0	\$22,320	\$4,340	0	\$17,980	\$3,471	\$0	\$3,471	5.2	18%	15	\$20,613	6.9
2	CRT Monitor Replacement	Faber Elementary School	4,662	1.1	0	\$4,440	\$0	\$0	\$4,440	\$736	\$0	\$736	6.0	10%	10	\$1,526	1.6
5	Lighting Controls Upgrade	Dunellen High School	13,855	0	0	\$23,090	\$10,055	0	\$13,035	\$2,153	\$0	\$2,153	6.1	14%	15	\$10,901	4.6
3	Lighting Equipment Upgrade	Dunellen High School	46,951	20	0	\$58,400	\$12,690	0	\$45,710	\$7,295	\$0	\$7,295	6.3	14%	15	\$35,401	15.6
11	Dishwasher Booster Heater	Faber Elementary School	2,724	27	-74	\$2,750	\$0	\$0	\$2,750	\$362	\$0	\$362	7.6	5%	10	\$185	0.5
11	Dishwasher Booster Heater	Dunellen High School	2,724	27	-74	\$2,750	\$0	\$0	\$2,750	\$355	\$0	\$355	7.8	5%	10	\$127	0.5
5	Lighting Controls Upgrade	Faber Elementary School	19,218	0	0	\$28,570	\$4,315	0	\$24,255	\$3,032	\$0	\$3,032	8.0	9%	15	\$9,456	6.4
13	Demand Controlled Ventilation	Dunellen High School	11,114	0	1,555	\$26,000	\$0	\$0	\$26,000	\$3,158	\$0	\$3,158	8.2	9%	15	\$9,116	12.8
5	Lighting Controls Upgrade	Lincoln Middle School	6,325	0	0	\$11,000	\$1,960	0	\$9,040	\$1,055	\$0	\$1,055	8.6	8%	15	\$2,695	2.1
4	Lighting Equipment Incremental Upgrade - LED	Dunellen High School	21,526	9	0	43,650	13,640	0	\$30,010	\$3,345	\$0	\$3,345	9.0	7%	15	\$7,177	7.2
13	Demand Controlled Ventilation	Faber Elementary School	11,577	0	1331	\$30,000	\$0	\$0	\$30,000	\$3,040	\$0	\$3,040	9.9	6%	15	\$3,796	11.6
4	Lighting Equipment Incremental Upgrade - LED	Faber Elementary School	25,116	11	0	56,245	16,380	0	\$39,865	\$3,963	\$0	\$3,963	10.1	5%	15	\$4,192	8.4
10	Kitchen Hood Controls	Dunellen High School	1,079	0	352	\$5,000	\$0	\$0	\$5,000	\$491	\$0	\$491	10.2	5%	15	\$464	2.4
10	Kitchen Hood Controls	Faber Elementary School	1,079	0	352	\$5,000	\$0	\$0	\$5,000	\$491	\$0	\$491	10.2	5%	15	\$458	2.4
4	Lighting Equipment Incremental Upgrade - LED	Lincoln Middle School	12,679	11	0	23,405	1,410	0	\$21,995	\$2,116	\$0	\$2,116	10.4	5%	15	\$1,529	4.2
9	Destratification Fans	Dunellen High School	-1,051	0	588	\$6,000	\$0	\$0	\$6,000	\$378	\$0	\$378	15.9	-8%	10	(\$2,935)	3.1
6	AC Unit Upgrades	Dunellen High School	9,183	5	54	\$25,180	\$1,288	\$0	\$23,892	\$1,477	\$0	\$1,477	16.2	-1%	15	(\$7,472)	3.4
9	Destratification Fans	Faber Elementary School	-1,489	0	921	\$10,000	\$0	\$0	\$10,000	\$604	\$0	\$604	16.5	-8%	10	(\$5,099)	4.9
6	AC Unit Upgrades	Faber Elementary School	36,173	19	594	\$111,150	\$5,306	\$0	\$105,845	\$6,248	\$0	\$6,248	16.9	-1%	15	(\$36,373)	15.5
12	Unit Ventilator Replacement	Faber Elementary School	4,032	0	1,066	\$75,000	\$0	\$0	\$75,000	\$1,608	\$0	\$1,608	46.6	-12%	15	(\$57,123)	7.6
12	Unit Ventilator Replacement	Dunellen High School	5,376	0	1,421	\$100,000	\$0	\$0	\$100,000	\$2,144	\$0	\$2,144	46.7	-12%	15	(\$76,167)	10.1
8	Domestic Water Heater Replacement	Lincoln Middle School	0	0	191	\$9,312	\$240	\$0	\$9,072	\$181	\$0	\$181	50.0	-12%	15	(\$7,055)	1.1
8	Domestic Water Heater Replacement	Dunellen High School	0	0	565	\$28,200	\$700	\$0	\$27,500	\$521	\$0	\$521	52.8	-13%	15	(\$21,712)	3.3
7	Boiler Replacement	Dunellen High School	0	0	5,082	\$180,000	\$4,000	\$0	\$176,000	\$4,679	\$2,000	\$2,679	65.7	2%	35	(\$41,189)	29.8
8	Domestic Water Heater Replacement	Faber Elementary School	0	0	648	\$45,152	\$920	\$0	\$44,232	\$591	\$0	\$591	74.8	-16%	15	(\$37,659)	3.8
Total			376,967	135	18,258	\$1,029,914	\$91,124	\$0	\$938,791	\$76,418	\$2,000	\$74,418	12.6	-	-	-	232

#### Notes:

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#### DUNELLEN PUBLIC SCHOOLS

ECMs

ECM#	Energy Conservation Measures (ECM)	Buildings	Energy Savings kWh	Demand Savings kW	Energy Savings Therms	Gross Installation Cost*	Rebates/ Incentives	Avoided Cost	Net Implimentation Costs	Annual Energy Cost Savings	Annaul Oper. Cost Savings	Total Annual Cost Savings	Simple Payback	Internal Rate of Return (IRR) (Net)	Measure Life Yrs	Lifecycle Savings (NPV)	CO2 Savings Tons
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Historic Energy Consumption	
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### Purpose:

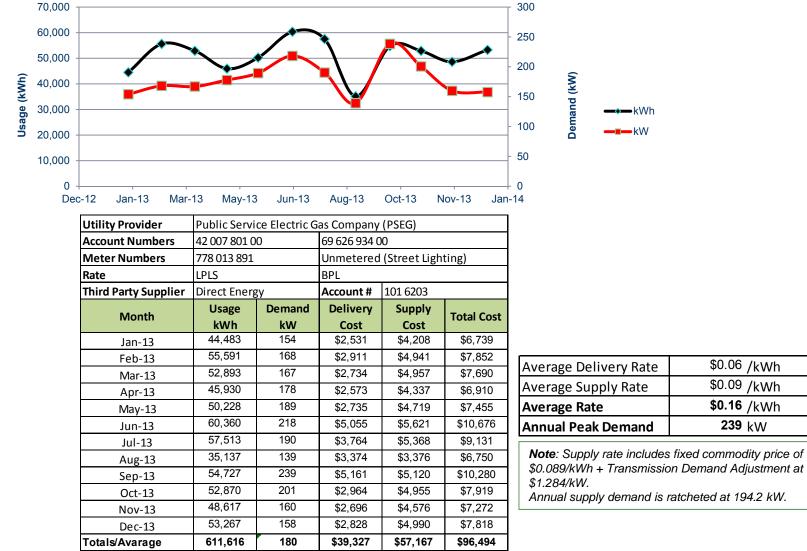
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## Scope:

- I. <u>Historic Energy Consumption</u>: Benchmark energy use using the Energy Star Portfolio Manager
- II. <u>Facility Description</u>: Characterize building usage, occupancy, size and construction.
- III. <u>Equipment Inventory</u>: Detailed equipment list including useful life and efficiency.
- IV. <u>Energy Conservation Measures</u>: Identify and evaluate opportunities for cost savings and economic returns.
- V. <u>Renewable/Distributed Energy Measures</u>: Evaluate economic viability of various renewable/distributed energy technologies.
- VI. <u>Energy Purchasing and Procurement Strategies</u>: Perform utility tariff analysis and assess potential for savings from energy procurement strategies.
- VII. Method of Analysis: Appendices



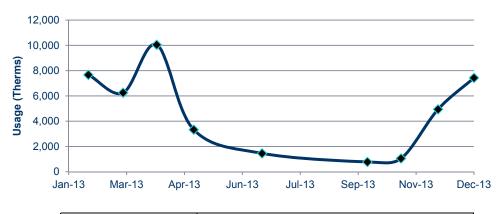
### Utility Usage and Costs Summary - Faber Elementary School - Electric (2013)



Dunellen Public School District, NJ



#### Utility Usage and Costs Summary - Faber Elementary School – Gas (2013)



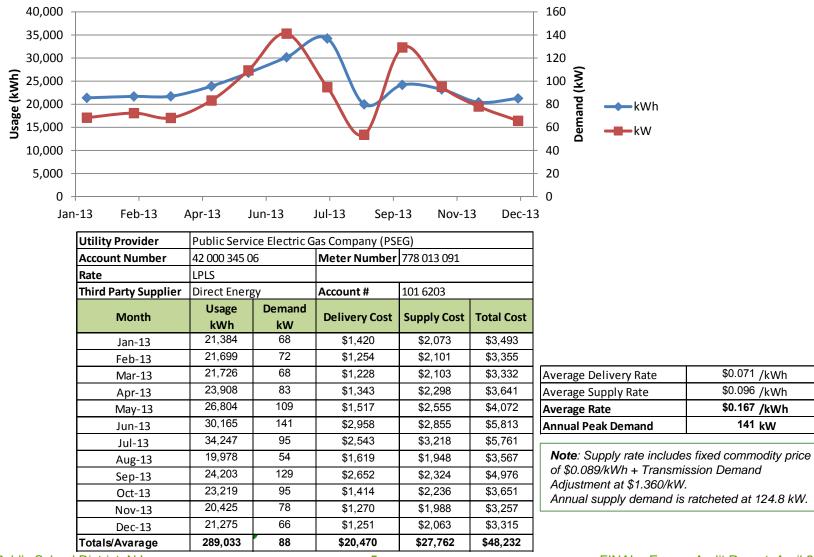
Utility Provider	Public Serv	Public Service Electric Gas Company (PSEG)						
Account Number	67 407 928 (	01	Meter #	252 30 55				
Rate	LVG							
Third Party Supplier	Hess	Account #	359 294/36	1 121				
N. a	Usage	Delivery	Supply	Tabel Cast				
Month	Therms	Cost	Cost	Total Cost				
Jan-13	7,670	\$2,604	\$4,418	\$7,022	]			
Feb-13	6,256	\$2,120	\$3,603	\$5,723				
Mar-13	10,049	\$3,385	\$5,788	\$9,173				
Apr-13	3,331	\$493	\$1,919	\$2,412	Average Delive			
Jun-13	1,455	\$415	\$838	\$1,253	Average Supply			
Sep-13	777	\$424	\$448	\$872	Average Rate			
Oct-13	1,051	\$248	\$606	\$854				
Nov-13	4,940	\$2,100	\$2,845	\$4,945	Note:			
Dec-13	7,429	\$2,633	\$4,279	\$6,912	June bill inclu			
Totals/Avarage	42,959	\$14,421	\$24,744	\$39,166	September b			

Average Rate	\$0.91 /Therm
Average Supply Rate	\$0.58 /Therm
Average Delivery Rate	\$0.34 /Therm

lune bill includes May – June September bill includes July - September



Utility Usage and Costs Summary - Lincoln Middle School- Electric (2013)

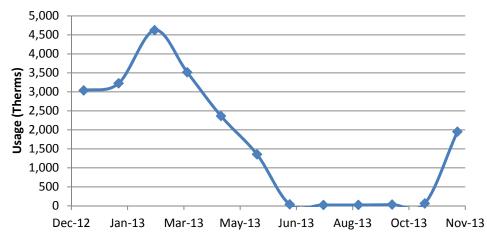


Dunellen Public School District, NJ

FINAL - Energy Audit Report, April 2014



### Utility Usage and Costs Summary - Lincoln Middle School - Gas (2012-2013)



Utility Provider	Public Service Electric Gas Company (PSEG)						
Account Number	42 000 345 0	)6	Meter Number	241 3079			
Rate	LVG						
Third Party Supplier	Hess Gas	Account #	359 294/361 121				
Month	Usage Therms	Delivery Cost	Supply Cost	Total Cost			
Dec-12	3,038	\$1,210	\$1,722	\$2,932			
Jan-13	3,226	\$1,202	\$1,829	\$3,031			
Feb-13	4,624	\$1,671	\$2,622	\$4,293			
Mar-13	3,516	\$1,434	\$1,993	\$3,427			
Apr-13	2,364	\$390	\$1,340	\$1,730			
May-13	1,355	\$282	\$768	\$1,050			
Jun-13	39	\$110	\$22	\$132			
Jul-13	23	\$108	\$13	\$121			
Aug-13	23	\$108	\$13	\$121			
Sep-13	33	\$109	\$19	\$128			
Oct-13	61	\$113	\$35	\$148			
Nov-13	1,950	\$1,038	\$1,106	\$2,144			
Totals/Avarage	20,252	\$7,773	\$11,483	\$19,256			

Average Rate	\$0.95 /Therm
Average Supply Rate	\$0.57 /Therm
Average Delivery Rate	\$0.38 /Therm

Dunellen Public School District, NJ

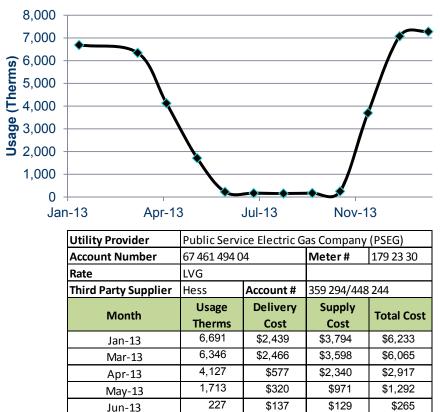


Utility Usage and Costs Summary - Dunellen High School – Electric (2013) 50.000 200 40,000 150 Demand (kW) Usage (kWh) 30,000 100 •kWh 20.000 kW 50 10,000 0 0 Jan-13 Feb-13 Jun-13 Jul-13 Apr-13 Sep-13 Nov-13 Dec-13 Utility Provider Public Service Electric Gas Company (PSEG) 42 005 427 06 69 630 576 05 Account Number Meter Number 778 020 390 Unmetered LPLS BPL Rate Third Party Supplier **Direct Energy TPS Account #** 359 294/448 244 Delivery Cost Supply Cost Demand, kW **Total Cost** Usage, kWh Month 41,723 126 \$2,119 \$3,882 \$6,001 \$0.062 /kWh Jan-13 Average Delivery Rate 41,925 130 \$5,989 \$2,089 \$3,900 \$0.093 /kWh Feb-13 Average Supply Rate 43,074 136 \$2,120 \$4,003 \$6,122 Mar-13 Average Rate \$0.155 /kWh 38.234 136 \$1,983 \$3,572 \$5,555 158 kW **Annual Peak Demand** Apr-13 142 38,631 \$2,015 \$3,607 \$5,622 May-13 41.797 158 \$3,553 \$3,889 \$7,442 *Note*: Supply rate includes fixed commodity Jun-13 112 price of \$0.089/kWh + Transmission 36.811 \$2.876 \$3,445 \$6.321 Jul-13 Demand Adjustment at \$1.362/kW. 24,225 82 \$2,137 \$2,325 \$4,462 Aug-13 Annual supply demand is ratcheted at 35,083 146 \$3.232 \$3.291 \$6,523 Sep-13 123.9 kW. 36,087 146 \$2.034 \$3,381 \$5,414 Oct-13 37.557 136 \$2.045 \$3.512 \$5,556 Nov-13 42.951 128 \$2,179 \$3,992 \$6,171 Dec-13 458,098 132 \$28,380 \$42,798 \$71,179 Totals/Avarage

Dunellen Public School District, NJ



Utility Usage and Costs Summary - Dunellen High School – Gas (2012-2013)



170

157

175

253

3,697

7,075

7,279

37,910

Jul-13

Aug-13

Sep-13

Oct-13

Nov-13

Dec-13

Jan-14 Totals/Avarage \$129

\$127

\$129

\$140

\$1,800

\$2.516

\$2,625

\$13,405

Average Rate	\$0.921 /Therm
Average Supply Rate	\$0.567 /Therm
Average Delivery Rate	\$0.354 /Therm

Dunellen Public School District, NJ

\$225

\$216

\$229

\$283

\$3,896

\$6.528

\$6.752

\$34,900

\$96

\$89

\$99

\$143

\$2,096

\$4,012

\$4,127

\$21,495



## **ENERGY STAR SCORES**

- > Energy Star Scores are calculated to establish a facility-specific energy intensity baseline.
- Energy Star can be used to compare energy consumption to other similar facilities and to gauge the success of energy conservation and cost containment efforts.
- Buildings with an Energy Star rating/score of 75 or above are eligible to apply for an official Energy Star Building label.

	Total Floor	Energy	Eligible to	Current Site	Current Source	Average Site EUI	Utility	Cost (\$/	sq.ft.)
Facility Name	Area (sq./ft.)	Star Score	Apply for ENERGY STAR	•••••••	Energy Intensity (kBtu/sq.ft.)	by Building Type		Electric	Total
Faber Elementary School	89,203	24	NO	69.7	121.4	55.2 - Elm. School	\$0.44	\$1.08	\$1.52
Lincoln Middle School	26,248	13	NO	107.7	182.4	73.8 - Md. School	\$0.73	\$1.84	\$2.57
High School	77,794	62	NO	66.3	111.1	74.5 - High School	\$0.45	\$0.91	\$1.36

- Note that Lincoln Middle School appears to have a lower score than the high school. This may be because some of the spaces in the High School building are fed from the Middle School.
- Dome-Tech recommends a total power analysis of the Middle School and High School to establish which areas are connected to which electric meter. This effort requires tracing of the existing power wiring and it is beyond the scope of a Local Government Energy Audit.



### Portfolio Manager Sign-In

- An account has been created for Dunellen Public Schools in Portfolio Manager. You should have received an email to notify you of the generation of this account and shared access with Dome-Tech.
- Now that the report has been finalized, you have full access to use/edit the information and change/update it as necessary.
- > Website link to sign-in:
- <u>http://www.energystar.gov/portfoliomanager</u>





# **Building Name:**

#### Address:

Gross Floor Area: Year Built: # Occupants: Building Usage:

### **Faber Elementary School**

High and Lehigh Streets Dunellen, NJ 08812 89,203 sq ft

1960. Additions completed in 1996 and 2006.

Approximately 570 students and 79 staff members

Elementary school, serving Pre-Kindergarten to Fifth grade.



Classes scheduled from approximately 8AM to 3PM, Monday thru Friday, with various before and after school programs. Some weekend usage every other weekend for sports. This facility also houses the District Board of Education on the second floor of the south wing, which operates between 8 AM and 4 PM. Facility is open between 6 AM and 11 PM for custodial and other support services.

# **Construction Features:**

Façade:	Concrete block and face brick façade in good condition.
Roof Type:	Mostly flat built up roof with black EPDM membrane in good condition.
	Pitched (attic) roof over 1996 structure and the all purpose room.
Windows:	Replaced in 2006. Operable aluminum frame windows with double pane clear glass. Covering approximately 25% of the façade. Excellent condition.
Exterior Doors:	Approximately ten (10) sets of doors, aluminum frame with double pane glass in good condition. 1960 building doors are old and have single pane windows.



#### **HVAC Systems**

- Media Center (12.5 Ton) and Computer Laboratory (4 Ton) are conditioned via two (2) Carrier Rooftop Units installed in 1996.
  - > These units are 19 years old and they appear to be in fair condition. The units are at the end of their useful life as per ASHRAE.
  - > Units are equipped with packaged DX cooling and natural gas heating coils.
- Gymnasium area is conditioned via four (4) 12.5 Ton Carrier Rooftop Units installed in 1996.
  - > These units appear to be in acceptable condition. However, they are near the end of their useful life as per ASHRAE.
  - > Units are equipped with packaged DX cooling and natural gas heating coils.
- Gymnasium locker rooms are connected to a heat-only make-up air unit made by Reznor.
  - > Although it appears to be in good condition, the unit does not operate on a regular basis.
- Board of Education Office on the second floor of the original (1960) structure was recently renovated. The space is conditioned with a split air conditioning system with two (2) remote DX condensers and indoor air handler with hot water heating coils.
  - > Total cooling capacity of the split system is 15 tons.
  - > The system was installed in 2011.











#### HVAC Systems (cont'd)

- 2006 addition houses the main entrance, main office, a conference room, several classrooms and nurses office.
  - > The main office and the classrooms are conditioned with a larger (25 Ton) Carrier VAV packaged rooftop air conditioning unit with DX cooling and natural gas heating.
  - Similarly, the nurses office and several additional spaces are conditioned with a 10 Ton Carrier packaged rooftop air conditioning unit with natural gas heat.
  - *>* Both units are in excellent condition.
- Some of the classrooms in the older spaces are conditioned via approximately 20 window air conditioning units.
  - The units vary in size between 12,000 to 18,000 BTU/hr. The majority of the units are recent models with Energy Star certification
- 1960 wing classrooms are heated and ventilated with the original unit ventilators made by Nesbitt.
  - > The units are significantly past their useful life and appear to be in poor condition.
  - > The units are connected to the building's hot water heating loop. The units are not equipped with any cooling.
  - > The units are connected to the original pneumatic control system
- > 1995 wing classrooms also have Nesbitt Unit Ventilators.
  - The units are connected to the building's hot water heating loop. The units are not equipped with any cooling.
  - > The units are connected to the digital Building Automation System.











#### HVAC Systems (cont'd)

- Original All-Purpose room heating and ventilation is provided with an H&V unit suspended in the stage area ceiling.
  - > The unit is connected to the building hot water heating loop via two (2) 3/4 HP circulators.
  - The space also has hot water baseboard heaters which were installed approximately 15 feet off the floor.
  - > There are temperature stratification issues in this space due to placement of the hot water radiators. There is a significant temperature difference between the floor and ceiling.
  - > It is recommended to install de-stratification fans to eliminate temperature stratification.

#### **Hot Water Heating Systems**

- The building is served by two separate boiler rooms located in the North and South wings.
- ➢ North boiler room (2005)
  - There are a total of twelve (12) HydroTherm modular, 300 MBH standard efficiency, gas fired hot water boilers with a total output capacity of 2,820 MBH.
  - > These boilers appear to be in excellent condition.
  - > The heating hot water is circulated via a set of two (2) 3 HP lead/lag base-mount pumps.
- South boiler room (1995)
  - There are a total of seven (7) SlantFin (CARAVAN) modular, 375 MBH standard efficiency, gas fired hot water boilers with a total output capacity of 2,625 MBH.
  - > These boilers appear to be in excellent condition.
  - > The heating hot water loop is energized via a set of two (2) 3 HP lead/lag inline circulators.











#### **Domestic Hot Water**

- > There are four (4) separate domestic water heaters scattered around the facility.
- > All of the water heaters are standard efficiency gas fired units
- > Each unit was added as the building was renovated or expanded in 1995 and 2005.
  - 1. PVI water heater (Est 200 gallon) serves the lockers rooms near Gymnasium. The unit appears to be over 10 years old.
  - 2. AO Smith water heater (80 gallon) serves faucets and bathrooms in the 1995 addition
  - 3. AO Smith water heater (100 gallon) serves faucets and bathrooms in the 2005 addition
  - 4. AO Smith water heater (300 gallon) serves the kitchen, which was added in 2005.
- All the water heaters have small circulators which are controlled via an aquathermostat. Circulators vary in size between 1/6 HP and 1/4 HP.
- > Kitchen dishwasher is coupled with a 27 kW electric booster heater.





### **Exhaust Fans**

- Ventilation air is drawn into the classrooms via unit ventilators and offices via rooftop units. Then nearly equal amount of air is exhausted from the corridors and other common spaces via ~15 roof exhausters.
- Some of the exhaust fans appear to be on time clocks. Others remain off or run 24/7. The control switches of many of the roof exhausters could not be located during the survey.

#### **Controls**

- The Faber Elementary School has a Carrier Comfort DDC Building Automation System which controls all of the major HVAC equipment in the facility except those in the 1960 wing.
- The Carrier BMS system is connected to the rooftop units, unit ventilators, boilers and pumps. The control system is capable of monitoring all the units and implementing time of day schedules.
- > The BMS is connected to local thermostats in each space.
- 1960 wing HVAC equipment (unit ventilators, cabinet heaters, and All Purpose Room H&V unit) are still connected to the original pneumatic control system. The pneumatic system is robust but it has limited control features. However, it appears to have some night setback capability.
- The pneumatic system is energized via a 2 x 1 HP duplex air compressor in excellent condition.











## Lighting Systems – Faber Elementary School

#### Interior Lighting

- Majority of the spaces in the Faber Elementary Schools is provided with fluorescent lighting fixtures with 700 series 32W T8 lamps and electronic ballasts.
- > 1960 wing classrooms are lit with fluorescent fixtures with 34W T12 lamps.
- Some newly renovated spaces are lit via compact fluorescent lamps in recessed can fixtures.
- Symnasium lighting is provided with 400W metal halide fixtures.
- All purpose room lighting is provided with 400W metal halide fixtures. Stage area has 300W incandescent fixtures.
- Library is lit with a combination of 100W metal halide and fluorescent fixtures.
- Some of the exit signs have incandescent lamps.
- > The lights are controlled via local light switches.
- There are no automated lighting controls in this facility. Lights are switched off by the custodians at night.

### **Exterior Lights**

- Exterior lighting is provided with wall-pack fixtures with 175W metal halide lamps.
- The parking lots are lit via pole lights which are owned and operated by the utility company.











<b>Building Name:</b>	Lincoln Middle School
Address:	400 Dunellen Avenue
	Dunellen, NJ 08812
Gross Floor Area:	26,248 sq ft
Year Built:	1929 with several major renovations, last in 1996 and 2005.
# Occupants:	Approximately 256 students and 20 staff members
Building Usage:	Middle School, serving sixth to eight graders. Classes scheduled from approximately 8AM to 3PM, Monday to Friday, with various before and after school programs. Little weekend usage. Average occupancy: 10 hours per day.
	No summer school.

# **Construction Features:**

Façade:	Concrete blocks with painted brick façade in good condition.
Roof Type:	Built up roof, flat with black rubber cover, in good condition.
Windows:	Covering 20% of façade, operable aluminum frames, double pane glass, in good condition.
Exterior Doors:	Approximately eight (8) sets of doors, aluminum frame with double pane glass.



### Major Mechanical Systems – Lincoln Middle School

### HVAC Systems

- Space conditioning is provided via three (3) packaged VAV rooftop air conditioning units with DX cooling coils and natural gas heating coils.
- The units serve approximately 12 VAV boxes. The units are equipped with Variable Frequency Drives and inverter duty premium efficiency motors.
  - > RTU #1 (60 Ton) serves Majority of the 2005 expansion (Main offices and faculty room).
  - > RTU #2 (40 Ton) serves Cafetorium.
  - > RTU #3 (35 Ton) serves 8 classrooms and the guidance office.
- > The rooftop units were installed in 2005 and they appear to be in excellent condition.

### Heating Systems

- There are five (5) HydroTherm modular, 300 MBH standard efficiency, gas fired hot water boilers with a total output capacity of 1,200 MBH.
  - 1. The boilers were installed in 1996 and they appear to be in good condition.
- Heating hot water from the boilers is circulated throughout the building via two (2) sets of 2 HP (est) lead/lag inline hot water circulators.
  - > Two (2) of the pumps are set up as lead/lag circulators for the new section of the building.
  - > The other two (2) pumps serve the original section of the building.
- > Hot water is circulated through the VAV reheat coils, hot water radiators etc.
- > Entrance lobbies and corridors on the perimeter are heated with hot water convectors or radiators.
- > Some of the bathrooms in this building was significantly overheated due to temperature control issues.







### Major Mechanical Systems – Lincoln Middle School

#### **Domestic Hot Water**

- > There are two (2) standard efficiency gas fired domestic water heaters in this facility.
- The water heaters have small circulators, which are controlled via an aquathermostat.
- In addition, there is a small electric domestic hot water heater in a mechanical closet in the second floor, which appears to be disconnected.

### **HVAC Controls**

- The Lincoln Middle School and Dunellen High School has an Envision DDC Building Automation System, which controls all of the major HVAC equipment in both buildings.
- The automation system is based in the High School building, which is adjacent to the Middle School.
- The system is capable of monitoring and scheduling rooftop units and VAV boxes in the building, as well as boilers, pumps and exhaust fans.





### Major Mechanical Systems – Lincoln Middle School

#### Kitchen & Cafetorium

- The kitchen is equipped with commercial reach-in refrigerators, gas stove, gas warmers and small cooking hood.
- The Cafetorium is a large multi-function space with large double pane aluminum windows and doors.
- > The Cafetorium is conditioned with a dedicated rooftop unit (RTU #2).

#### Interior Lighting

- Original spaces have fluorescent lighting fixtures with 700 series 32W T8 lamps and electronic ballasts.
- Some of the spaces in the new section have fluorescent lighting fixtures with 800 series 31W U8 lamps and electronic ballasts.
- Main lobby and the corridor are lit via compact fluorescent lamps in recessed can fixtures.
- > The lights are controlled via local light switches.
- There are no automated lighting controls in this facility. Lights are switched off by the custodians at night.

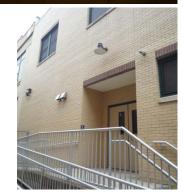
### **Exterior Lights**

Exterior lighting is provided with wall-pack fixtures with 175W metal halide lamps and several other fixtures with HID lamps and incandescent lamps.











<b>Building Name:</b>	Dunellen High School
Address:	411 First Street Dunellen, NJ 08812
Gross Floor Area:	77,794 sq ft
Year Built:	1930 with several major renovations, last in 2006.
# Occupants:	Approximately 333 students and 61 staff members
Building Usage:	High School, serving ninth to twelfth grades. Classes scheduled from approximately 8AM to 3PM, Monday to Friday, with various before and after school programs. Limited weekend usage. Average occupancy: 10 hours per

weekday. The building is used for summer school.

## **Construction Features:**

Façade:	Concrete blocks with painted brick façade in good condition.
Roof Type:	Built up roof, flat with black rubber cover in good condition.
Windows:	Covering 20% of façade, operable aluminum frames, double pane glass, in good condition.
Exterior Doors:	Approximately ten (10) sets of metal doors with and without glass, in good condition.

DUNELLEN



#### **HVAC Systems - Classrooms**

- > Heating and ventilation for the classrooms are provided by approximately forty (40) unit ventilators.
- There are several different vintages of unit ventilators including several units from the 1960s and other units from the 1980s/1990s.
- The unit ventilators are heating only with hot water heating coils.
- Condition of the outside air dampers and actuators were reported to be okay. However, this could not be verified during the survey.
- > Cooling for some of the classrooms is provided window unit air conditioners.
  - There are approximately 10 window air conditioners on this site. Some of the units were removed for the winter.
- > Two (2) classrooms have ductless split air conditioning units with wall mounted indoor units.
  - > One of the units is an older 3-ton model made by EMI.
  - > The other unit is a high efficiency 3-ton Fujitsu unit in great condition.
- Two (2) classrooms have ductless split air conditioning units with ceiling cassette evaporators.
  - > Both of these units are out of commission.













#### HVAC Systems – Packaged Rooftop Air Conditioners with Natural Gas Heat

- > One (1) 5-Ton Trane RTU (2005) serves the main office. It is in excellent condition.
- One (1) 4-Ton Lennox RTU (1993) serves Special education services. Fair condition. It has past the end of its useful service life.
- > One (1) 40-Ton Trane RTU (2005) serves the Auditorium Seating Area. Excellent condition.
- Two (2) 5-Ton Carrier RTUs (1999) serves the Library seating area. (Cooling only). Good condition.
- > One (1) 20-Ton Trane RTU (2005) serves the Auditorium Stage. Excellent condition.

#### HVAC Systems – Heating and Ventilation Units

- Gymnasium heating and ventilation is provided with two (2) heating and ventilation units with hot water coils suspended in the ceiling.
- > Bathrooms and entryways are heated with hot water convectors.
- > Locker rooms are heated with H&V units and supplemented with unit heaters.









#### **Heating Systems**

- The building is served by two (2) H.B. Smith Co. boilers, located in the boiler room. Units are built in 1959 and appear to be in fair condition.
- > The boilers are coupled with modulating burners by Industrial Combustion.
- > The boiler and pipes have asbestos insulation.
- Heating hot water from the boilers is circulated throughout the building via two (2) sets lead/lag inline hot water circulators (4 pumps total)
  - > Two (2) of the pumps are set up as lead/lag circulators for the 1960 wing. (3 HP + 5 HP)
  - > The other two (2) 3 HP pumps serve the west wing. Pumps appear to be in good condition.

#### **Domestic Hot Water**

- One (1) standard efficiency, 71 Gallon AO Smith Domestic Water Heater serves the bathrooms and faucets in the laboratories.
- Another domestic water heater serves the kitchen. This water heater was not accessible during the survey.

#### **Controls**

- The Lincoln Middle School and Dunellen High School have an Envision DDC Building Automation System, which controls all of the major HVAC equipment in both buildings.
- The system is capable of monitoring and scheduling rooftop units and VAV boxes in the building, as well as boilers, pumps and exhaust fans.
- 1960 wing HVAC equipment (unit ventilators, cabinet heaters) are still connected to the original pneumatic control system. The pneumatic system is robust but has limited control features. The pneumatic system is energized via a 2 x 1 HP duplex air compressor in excellent condition.









#### Kitchen & Cafeteria

- The kitchen is equipped with commercial reach-in refrigerators, gas stove, gas warmers and a large (5x15) cooking hood.
- > The facility has one walk-in refrigerator and one walk-in freezer (outdoor).
- > There is a commercial dishwasher with electric booster heater.
- > The gas stove has large pilot light which is ON 24/7.
- > Cafeteria is reported to have asbestos ceiling tiles.

#### Interior Lighting

- > Ceiling tiles in the West Wing are made of asbestos.
- Majority of the spaces have fluorescent lighting fixtures with 700 series 32W T8 lamps and electronic ballasts.
- > 1960 wing classrooms are lit with fluorescent fixtures with 34W T12 lamps.
- Gymnasium lighting is provided with 400W metal halide fixtures.
- Auditorium lighting is provided with a combination of 400W metal halides, incandescent lamps and compact fluorescent lamps in the seating area. Stage area is lit with fluorescent T8 fixtures.
- > There are a small number of incandescent exit signs in the older spaces.
- The lights are controlled via local light switches. There are no automated lighting controls in this facility. Lights are switched off by the custodians at night.

#### **Exterior Lights**

- Exterior lighting is provided with wall-pack fixtures with 175W metal halide lamps and several other fixtures with HID lamps and incandescent lamps.
- > The parking lots are lit via pole lights, which are owned and operated by the utility company.











# **Greenhouse Gas Emission Reduction**

Implementation of all identified ECMs will yield:

- > 377,000 kilowatt-hours of annual avoided electric usage.
- > 18,250 therms of annual avoided natural gas usage.
- This equates to the following <u>annual</u> reductions:

> 232 tons of CO2;

-OR-

> 40 Cars removed from road;

-OR-

> 63 Acres of trees planted annually



The Energy Information Administration (EIA) estimates that power plants in the state of New Jersey emits 0.666 lbs CO2 per kWh generated.



The Environmental Protection Agency (EPA) estimates that one car emits 11,560 lbs CO2 per year.



The EPA estimates that reducing CO2 emissions by 7,333 pounds is equivalent to planting an acre of trees.



### Energy Conservation Measures (ECMs) Notes and Assumptions

- > The average  $CO_2$  emission rate from power plants serving the facilities within this report was obtained from the Environmental Protection Agency's (EPA) eGRID2007 report. It is stated that power plants within the state of NJ emit 0.66 lbs of  $CO_2$  per kWh generated.
  - > The EPA estimates that burning one therm of natural gas emits 11.708 lbs CO<sub>2</sub>.
  - > The EPA estimates that one car emits 11,560 lbs  $CO_2$  per year.
  - The EPA estimates that reducing CO<sub>2</sub> emissions by 7,333 pounds is equivalent to planting an acre of trees.
- > The following utility prices provided were used within this study:

School	Electric (\$/kWh)	Natural gas (\$/therm)
Elementary School	\$0.158	\$0.912
Middle School	\$0.167	\$0.951
High School	\$0.155	\$0.921



### **ECM #1: Computer Power Management System**

	Faber Elementary School	Lincoln Middle School	High School	TOTAL
Number of Computers	111	26	154	291
Estimated Annual Savings:	\$3,260	\$226	\$2,081	\$5,568
Gross Estimated Implementation Cost <sup>1</sup> :	\$3,330	\$780	\$4,620	\$8,730
Approx. NJ Smart Start Rebate <sup>2</sup> :	\$0	\$0	\$0	\$0
Net Estimated Implementation Cost:	\$3,330	\$780	\$4,620	\$8,730
Simple Payback (years):	1.0	3.5	2.2	1.6
Annual Avoided CO <sub>2</sub> Emissions (tons):	6.9	0.5	4.5	4

<sup>1</sup> Cost estimates based on previous vendor quote

<sup>2</sup> No prescriptive New Jersey Smart Start rebates are available for this measure

- Computer screen savers were originally developed to prevent the permanent etching of patterns on older monochrome monitors. In this mode, both the computer and monitor consume the same amount of energy as the computer in regular operation, which is approximately 225W for the computer and 75W for the monitor.
- Dome-Tech recommends installing a school district wide computer power management system (such as Verdiem's Surveyor software). This software would place the computers into a standby/sleep mode during periods of inactivity. In this mode, the computer and monitor will draw between 1 and 3 Watts each. This would significantly reduce the computers electrical energy consumption.
  - The computers will "wake up" instantaneously when the mouse or button on the keyboard is touched, causing no interruption during daytime use.
  - When the computers "wake up," all active files and programs will be available as before entering the standby/sleep mode, ensuring no data will be lost.
- > This ECM is not expected to reduce the building(s)' electrical demand.



# **ECM #2: CRT Monitor Replacement**

	Faber Elementary School
Number of Computers	37
Estimated Annual Savings:	\$736
Gross Estimated Implementation Cost <sup>1</sup> :	\$4,440
Approx. NJ Smart Start Rebate <sup>2</sup> :	\$0
Net Estimated Implementation Cost:	\$4,440
Simple Payback (years):	6.0
Annual Avoided CO <sub>2</sub> Emissions (tons):	1.6



<sup>1</sup> Cost estimates based on previous vendor quote

<sup>2</sup> No prescriptive New Jersey Smart Start rebates are available for this measure

- There are a number of CRT monitors in one or more of these facilities. CRT monitors use significantly more energy than modern LCD or LED monitors.
- > Typical CRT monitor uses approximately 75W on an average while an LED monitor uses less than 20W.
- > In addition, LED monitors have a longer life span and take up less space.
- > Dome-Tech recommends replacing all existing CRT monitors with LED flat panel monitors throughout the facility.
- > Installation costs were neglected since this can easily be implemented by the users (teachers) or the IT staff.



# ECM #3: Lighting Upgrade

Standard Upgrade	Faber Elementary School	Lincoln Middle School	Dunellen High School	TOTAL
Estimated Annual Savings:	\$12,330	\$3,471	\$7,295	\$23,096
Gross Estimated Implementation Cost <sup>1</sup> :	\$70,570	\$22,320	\$58,400	\$151,290
Approx. NJ Smart Start Rebate <sup>2</sup> :	\$13,880	\$4,340	\$12,690	\$30,910
Net Estimated Implementation Cost:	\$56,690	\$17,980	\$45,710	\$120,380
Simple Payback (years):	4.6	5.2	6.3	5.2
Annual Avoided CO <sub>2</sub> Emissions (tons):	26.0	6.9	15.6	48.6

<sup>1</sup> Cost estimates based on actual costs of similar comprehensive lighting projects; see room-by-room surveys in Appendix for details

<sup>2</sup> See appendix for details on NJ Smartstart rebates

Dome-Tech performed a room-by-room lighting audit of all three school buildings. Audit findings are summarized below:

- > Faber Elementary School
  - > Majority of the spaces have fluorescent fixtures with 700 series 32W T8 lamps, CFLs. 1960 wing has older fixtures with 34W T12 lamps.
  - > Gymnasium and All purpose room lighting is provided with 400W metal halide fixtures. All Purpose Room Stage area has 300W incandescent lamps. Library is lit with a combination of fluorescent fixtures and 150W recessed metal halide fixtures.
  - > Some of the exit signs have incandescent lamps. Exterior lighting is provided mostly with 175W metal halide wall-pack fixtures.
- Lincoln Middle School
  - > Original spaces have fluorescent lighting fixtures with 700 series 32W T8 lamps and electronic ballasts. New sections have fluorescent lighting fixtures with 800 series 31W U8 lamps and electronic ballasts. The main lobby and the corridor are lit via CFLs in recessed fixtures.
  - > The lights are controlled via local light switches.
- High School
  - > Spaces have fluorescent lighting fixtures with a combination of T8 and T12 lamps.
  - > Gymnasium lighting is provided with 400W metal halides.
  - > Auditorium lighting is provided with a combination of 400W metal halides, incandescent lamps and compact fluorescent lamps.
  - > There are a small number of incandescent exit signs in the older spaces.



ECM #3: Lighting Upgrade (Cont'd)

#### Dome-Tech recommends the following strategies for lighting upgrade opportunities at the Dunellen Public Schools

- > Re-lamp and re-ballast existing fluorescent fixtures with F28T8 fixtures and energy efficient program start ballasts.
- > Replace the fixtures only if they are significantly old and deteriorated.
- > Please note that other consultants needs to be hired before doing any renovation in spaces with asbestos ceilings. The cost of this measure does not include asbestos abatement efforts.
- > Replace 8-ft T12 fixtures with 8ft 4 lamp fixtures fitted with F28T8 lamps.
- > Replace all the incandescent lamps with either CFLs (Compact Fluorescent Lamps) or LED lamps.
- > Replace metal halide high-bay fixtures with high output fluorescent fixtures with T5HO lamps, mirrored reflectors, and wire guard.
- > Replace metal halide exterior fixtures with LED exterior fixtures.



# ECM #4: Lighting Upgrade – LED

Incremental Analysis	Faber Elementary School	Lincoln Middle School	Dunellen High School	TOTAL
Estimated Annual Savings:	\$3,963	\$2,116	\$3,345	\$9,423
Gross Estimated Implementation Cost <sup>1</sup> :	\$56,245	\$23,405	\$43,650	\$123,300
Approx. NJ Smart Start Rebate <sup>2</sup> :	\$16,380	\$1,410	\$13,640	\$31,430
Net Estimated Implementation Cost:	\$39,865	\$21,995	\$30,010	\$91,870
Simple Payback (years):	10.1	10.4	9.0	9.7
Annual Avoided CO <sub>2</sub> Emissions (tons):	8.4	4.2	7.2	19.8

<sup>1</sup> Cost estimates based on actual costs of similar comprehensive lighting projects; see room-by-room surveys in Appendix for details <sup>2</sup> See appendix for details on NJ Smartstart rebates

Dome-Tech performed an incremental analysis in order to show an analysis of upgrading the existing light fixtures with LED lamps.

> Analysis is based on replacing the existing T8 or T12 tubes with LED tubes.



- LED tube lighting installation is fairly straight forward. First, the existing ballast is bypassed. Then, the fluorescent tubes are simply replaced with LED tubes.
- The analysis suggests that the incremental cost of LED tubes as compared to F28T8 tubes pays back in approximately 9 to 12 years. The variation is due to whether the existing lamps are T12s or T8s.
- Note that this ECM is based on incremental cost and savings over ECM #3. Total cost and savings associated with full LED upgrade are as follows.

LED Upgrade	Faber Elementary School (Alt)	Lincoln Middle School (Alt)	Dunellen High School (Alt)	TOTAL
Estimated Annual Savings:	\$16,292	\$5,587	\$10,640	\$32,519
Gross Estimated Implementation Cost <sup>1</sup> :	\$126,815	\$45,725	\$102,050	\$274,590
Approx. NJ Smart Start Rebate <sup>2</sup> :	\$30,260	\$5,750	\$26,330	\$62,340
Net Estimated Implementation Cost:	\$96,555	\$39,975	\$75,720	\$212,250
Simple Payback (years):	5.9	7.2	7.1	6.5
Annual Avoided CO <sub>2</sub> Emissions (tons):	34.4	11.1	22.8	68.3

Dunellen Public School District, NJ



# ECM #5: Lighting Controls Upgrade

Standard Upgrade	Faber Elementary School	Lincoln Middle School	High School	TOTAL
Estimated Annual Savings:	\$3,032	\$1,055	\$2,153	\$6,240
Gross Estimated Implementation Cost <sup>1</sup> :	\$28,570	\$11,000	\$23,090	\$62,660
Approx. NJ Smart Start Rebate <sup>2</sup> :	\$4,315	\$1,960	\$10,055	\$16,330
Net Estimated Implementation Cost:	\$24,255	\$9,040	\$13,035	\$46,330
Simple Payback (years):	8.0	8.6	6.1	7.4
Annual Avoided $CO_2$ Emissions (tons):	6.4	2.1	4.6	13.1

<sup>1</sup> Cost estimates based on actual costs of similar comprehensive lighting projects; see room-by-room surveys in Appendix for details

<sup>2</sup> See appendix for details on NJ Smartstart rebates

Dome-Tech performed a room-by-room lighting audit of all three school buildings. Audit findings are summarized below:

- > Currently, Dunellen Schools have no means of automatic controls for lighting.
- > Energy savings can be achieved by installing occupancy sensors in classrooms, offices and restrooms.
- > An occupancy sensor can switch off the lights when the room is not occupied.
- > Dome-Tech recommends installing ceiling mount and/or wall mount occupancy sensors where applicable.
- > See Investment Grade Lighting Audit Appendix for detailed calculations.







# ECM #6: AC Unit Upgrades

	Faber Elementary School	Dunellen High School	TOTAL
Estimated Annual Savings:	\$6,248	\$1,477	\$7,725
Gross Estimated Implementation Cost:	\$111,150	\$25,180	\$136,330
Approx. NJ Smart Start Rebate:	\$5,306	\$1,288	\$6,594
Net Estimated Implementation Cost:	\$105,845	\$23,892	\$129,737
Simple Payback (years):	16.9	16.2	16.8
Annual Avoided CO <sub>2</sub> Emissions (tons):	15.5	3.4	18.9

- Some of the packaged rooftop air conditioning units at the Dunellen Schools are past their useful life. These units are in fair or poor condition and need replacement.
- Rooftop replacement is typically a costly undertaking and it cannot always be justified solely by energy savings. This analysis quantifies the energy savings that may be achieved by replacing the older packaged rooftop units.
- > The following is the list of equipment that needs to be replaced in the near future.
- Since it has a negative Net Present Value, Dome-Tech does not recommend implementing this ECM for energy savings.

Tag#	Location	Qty	Area Serving	Cooling Capacity (tons)	Cooling EER	Heating Source	Heating Capacity input - MBH	Furnace Efficiency	Flow Type	Outside Air Economizer	
RTU	Faber Elementary School	1	Media Center	12.5	9.5	Natural Gas	250	80%	CAV	No	1995
RTU	Faber Elementary School	1	Computer Room	4	11.2	Natural Gas	115	80%	CAV	No	1995
RTU	Faber Elementary School	4	Gymnasium	12.5	9.5	Natural Gas	250	80%	CAV	Yes	1995
RTU	Roosevelt High School	2	Library	5	9	None	0	0%	CAV	No	1999
RTU	Roosevelt High School	1	Special Education	4	10	Natural Gas	125	80%	CAV	Yes	1995

CAV: Constant Air Volume



# ECM #7: Boiler Upgrade

	High School
Estimated Annual Energy Savings:	\$4,643
Estimated Annual O&M Savings:	\$2,000
Gross Estimated Implementation Cost:	\$180,000
Approx. NJ Smart Start Rebate:	\$4,000
Net Estimated Implementation Cost:	\$176,000
Simple Payback (years):	26.5
Annual Avoided CO <sub>2</sub> Emissions (tons):	30



- The High School Boiler Plant includes two (2) 4,320 MBH, original HB Smith Cast Iron hot water boilers. The boilers are approximately 55 years old.
- > Due to age, the boilers require frequent repairs and cause other maintenance issues.
- Cast iron boilers have limited hot water supply temperature reset capabilities due to possible thermal shock and cracking.
- Dome-Tech reviewed energy cost and savings potential for replacing the old cast iron boilers with condensing hot water boilers.
- > It is recommended to resize the boiler plant for the building's current heating load.
- An aggressive hot water supply temperature reset strategy is required to achieve proposed savings.
- This ECM is not recommended for implementation as a standalone energy savings measure. However, it should be considered if a holistic energy improvement program is considered in the future (Such as NJ ESIP). See Appendix for detailed calculations.



# ECM #8: Domestic Water Heater Replacement

	Faber Elementary School	Lincoln Middle School	Dunellen High School
Estimated Annual Energy Savings:	\$599	\$242	\$553
Estimated Annual O&M Savings:	\$0	\$0	\$0
Gross Estimated Implementation Cost:	\$45,152	\$9,312	\$28,200
Approx. NJ Smart Start Rebate:	\$920	\$240	\$700
Net Estimated Implementation Cost:	\$44,232	\$9,072	\$27,500
Simple Payback (years):	74	37	50
Annual Avoided CO <sub>2</sub> Emissions (tons):	4	1	3



- > Each school has multiple domestic water heaters serving various spaces.
- > All of the domestic water heaters are standard efficiency units.
- > Condensing water heaters are significantly more efficient than standard water heaters.
- Nevertheless, since there are multiple water heaters in each facility, implementation cost of this ECM is very high.
- > Therefore, this ECM is reviewed but not recommended for any of these facilities.
- > This ECM should be considered when existing water heaters reach their useful service life.
- > See Appendix for a list of water heaters and corresponding replacement strategies.





# **ECM #9: De-stratification Fans**

Standard Upgrade	Faber Elementary School	Dunellen High School	TOTAL
Estimated Annual Savings:	\$604	\$378	\$982
Gross Estimated Implementation Cost:	\$10,000	\$6,000	\$16,000
Approx. NJ Smart Start Rebate:	\$0	\$0	\$0
Net Estimated Implementation Cost:	\$10,000	\$6,000	\$16,000
Simple Payback (years):	16.5	15.9	16.3
Annual Avoided CO <sub>2</sub> Emissions (tons):	4.9	3.1	8.0

- Stratification is a term used to describe the difference in air temperatures as you go from floor to ceiling in enclosed structures.
- De-Stratification is achieved by efficiently balancing these temperatures from floor to ceiling.
- The de-stratification fans will balance the space temperature, from floor to ceiling and wall to wall. De-stratification fans are typically compact, low-wattage, quiet fans requiring minimal power for operation.
- It is estimated that air stratification results in approximately 10 to 15°F temperature difference between the floor and ceiling of the space. This means the average temperature of the space is approximately 5 to 7.5°°F above the temperature on the floor.
- This ECM results with a negative net present value. Therefore, it is not recommended as a stand-alone measure. However, it can be considered as a part of large holistic energy savings plan.
- > The following spaces are suitable for this measure:

Index	Building	Space
1	Faber Elementary School	All Purpose Room
2	Faber Elementary School	Gymnasium
3	Dunellen High School	Gymnasium





# ECM #10: Kitchen Hood Controls

Standard Upgrade	Faber Elementary School	Dunellen High School	TOTAL
Estimated Annual Savings:	\$491	\$491	\$982
Gross Estimated Implementation Cost:	\$5,000	\$5,000	\$10,000
Approx. NJ Smart Start Rebate:	\$0	\$0	\$0
Net Estimated Implementation Cost:	\$5,000	\$5,000	\$10,000
Simple Payback (years):	10.2	10.2	10.2
Annual Avoided CO <sub>2</sub> Emissions (tons):	2.4	2.4	0.7



- > The kitchen make-up air units provide conditioned air to replace all the air exhausted through the exhaust hood.
- > The exhaust hoods at the facility are currently controlled via manual switches. The hoods usually run at nominal capacity during the kitchen hours of operation.
- > Installing an efficient the kitchen exhaust control system will reduce the total kitchen exhaust and make-up air quantity.
- Savings will be generated during winter by reducing the amount of make-up air that needs to be conditioned to zone temperature.
- > The system includes temperature and smoke sensors, which detect cooking activity and control exhaust and make-up fan accordingly.
- Implementation includes installation of a kitchen exhaust hood control panel which will be connected to the exhaust fan and the makeup air unit.
- Recommended controller is not a variable speed system, which is typically more efficient but has significantly higher implementation cost.
- > Basis of design for this ECM is Greenheck Kitchen Ventilation Control/Energy Management System or equivalent.
- > Dome-tech recommends implementing this measure due to its high return on investment.



Standard Upgrade	Faber Elementary School	Dunellen High School	TOTAL
Estimated Annual Savings:	\$362	\$355	\$717
Gross Estimated Implementation Cost:	\$2,750	\$2,750	\$5,500
Approx. NJ Smart Start Rebate:	\$0	\$0	\$0
Net Estimated Implementation Cost:	\$2,750	\$2,750	\$5,500
Simple Payback (years):	7.6	7.8	7.7
Annual Avoided CO <sub>2</sub> Emissions (tons):	0.5	0.5	1.8



- The kitchens at Faber Elementary School and Dunellen High School are equipped with electric hot water booster heaters for dishwashers.
- A booster heater provides up to 180°F hot water to be supplied to commercial dishwashers.
- Electric booster heater operation costs are significantly higher than gas fired booster heaters.
- Dome-Tech recommends replacing the existing electric booster heaters with gas fired heaters at Faber Elementary School and Dunellen High School kitchens.
- > See Appendix for energy savings calculations and other details.





	Faber Elementary School	Dunellen High School	TOTAL
Estimated Annual Savings:	\$1,608	\$2,144	\$3,751
Gross Estimated Implementation Cost:	\$75,000	\$100,000	\$175,000
Approx. NJ Smart Start Rebate:	\$0	\$0	\$0
Net Estimated Implementation Cost:	\$75,000	\$100,000	\$175,000
Simple Payback (years):	46.6	46.7	46.6
Annual Avoided CO <sub>2</sub> Emissions (tons):	7.6	10.1	17.7



- Some of the unit ventilators at the Faber Elementary School and Dunellen High School are past their useful life. These units are in fair or poor condition and need replacing.
- > There are an estimated 15 unit ventilators at the 1960 wing in Faber Elementary School
- > There are an estimated 20 unit ventilators at the 1960 wing in Dunellen High School
- Unit ventilator replacement is typically a costly undertaking and it cannot always be justified solely by energy savings.
   This analysis quantifies the energy savings that may be achieved by replacing the older units ventilators.
- This ECM includes replacement of the existing older (1960 vintage) unit ventilators with new more efficient unit ventilator.
- > The proposed unit ventilators shall be connected to the BMS and shall have demand-controlled ventilation.
- Since it has a negative Net Present Value, Dome-Tech does not recommend implementing this ECM for energy savings.



# **ECM #13: Demand Controlled Ventilation**

Standard Upgrade	Faber Elementary School	Lincoln Middle School	Dunellen High School	TOTAL
Estimated Annual Savings:	\$3,040	\$1,878	\$3,158	\$8,076
Gross Estimated Implementation Cost:	\$30,000	\$8,000	\$26,000	\$64,000
Approx. NJ Smart Start Rebate:	\$0	\$0	\$0	\$0
Net Estimated Implementation Cost:	\$30,000	\$8,000	\$26,000	\$64,000
Simple Payback (years):	9.9	4.3	8.2	7.9
Annual Avoided CO <sub>2</sub> Emissions (tons):	11.6	6.4	12.8	30.9

- Building codes require that a minimum amount of fresh air be provided to ensure adequate air quality. To comply, ventilation systems often operate at a fixed rate based on an assumed occupancy (e.g., 20 CFM/person multiplied by the maximum design occupancy). Since maximum design occupancy is rarely achieved throughout the entire day, this results in excessive fresh air volumes, which require costly and unnecessary conditioning.
- Demand-controlled ventilation (DCV) controls the amount of outside air being supplied based upon the CO2 levels generated by building occupants. DCV should be added to any space that is ventilated by a large quantity of outdoor air, and where occupancy varies dramatically (gymnasiums, auditorium, cafeteria and libraries).
- Because CO2 levels correlate directly with the number of people in an occupied zone, CO2 sensors will be used to control the ventilation rate of outside air supplied to each zone. Reducing the amount of outdoor air supplied to a zone reduces the energy required to heat and cool that air, while space conditions are kept in compliance with building codes and standards, such as the ASHRAE Indoor Air Quality Standard.
- > This ECM has a positive net present value and should be considered for implementation. .



Standard Upgrade	Faber Elementary School	Lincoln Middle School	Dunellen High School	TOTAL
Estimated Annual Savings:	\$1,558	\$651	\$941	\$3,150
Gross Estimated Implementation Cost <sup>1</sup> :	\$5,000	\$2,000	\$3,000	\$10,000
Approx. NJ Smart Start Rebate <sup>2</sup> :	\$0	\$0	\$0	\$0
Net Estimated Implementation Cost:	\$5,000	\$2,000	\$3,000	\$10,000
Simple Payback (years):	3.2	3.1	3.2	3.2
Annual Avoided CO <sub>2</sub> Emissions (tons):	9.2	3.7	5.5	18.4



- Some of the exhaust fans at each facility are not connected to a timer, running 24/7.
- Exhaust fans can be connected to existing Building Management System and scheduled to shut off during unoccupied hours for saving energy.
- > Dome-Tech recommends connecting all the exhaust fans to the Building Management System.



#### **Faber Elementary School**

- > Lights in the classrooms stay on the until the custodians shut them off later in the day.
- > Computers were left "ON" but the monitors were left "OFF" even when they were not in use
- > The Reznor make-up air unit (serving the locker rooms) does not operate.
- > A large domestic water heater (DHW-4) near the Gymnasium does not operate.
- Some of the exhaust fans do not operate.
- > The Gym RTUs have control issues due to age.
- The West Entrance and Old Main Entry have single pane windows. It is recommended to replace these windows during next renovation.
- > The BMS system is reported to have minor problems, which has been corrected on an ongoing effort.



#### Lincoln Middle School

- > Lights in the classrooms stay on the until the custodians shut them off later in the day
- The latches on the High School bridge windows were observed to be broken causing cold air draft. It is recommended to fix or replace locks on these windows.
- > A number of the Middle School's windows were observed to be open during very cold winter days.
  - > Any overheating issues can be remedied by occupants by actively adjusting the thermostat.
  - Dome-Tech recommends training the teachers and staff for the energy and environmental impact of windows left open, and that a check of windows be performed in every class at the end of the day.
- 2nd floor boys and girls rooms near the High School Bridge are significantly overheated due to a failed valve. It is recommended to repair or replace the fault hot water valve



#### **Dunellen High School**

- > The two cassettes in the Computer Lab and Typing Room appear to be broken.
- > Lights in the classrooms stay on until the custodians shut them off later in the day
- Some of the windows and their locks of the bridge connection were observed to be broken. It is recommended to fix window latches throughout the facility.
- > The small split AC unit serving the typing room does not work.
- > Trane RTU serving the auditorium seating area has a squeaking belt.
- One of the Carrier units serving the Library was set to cool. The unit short cycled several times during the observation.
- Several entrance corridors on the ground floor are overheated. The hot water convector serving these spaces should be checked for proper operation.
- The High school has outdated stoves with large pilot lights. This is not going to warrant enough energy savings for a replacement. However, if an equipment upgrade is considered, it is recommended to install stoves and other cooking equipment with spark igniters.



#### Distributed Generation & Renewable Energy

- Distributed Generation (on-site generation) generates electricity from many small energy sources. These sources can be renewable (solar/wind/ geothermal) or can be small scale power generation technologies (CHP, fuel cells, microturbines).
- Renewable energy is energy generated from natural resources (sunlight, wind, and underground geothermal heat) which are naturally replenished.
- A cogeneration or Combined Heat and Power (CHP) system is not suitable for this site due to low annual hours of operation.
- > Dome-Tech performed a solar energy analysis for the Schools covered in this audit.



#### Solar Photovoltaic

- Sunlight can be converted into electricity using photovoltaics (PV).
- > A solar cell or photovoltaic cell is a device that converts sunlight directly into electricity.
- Photons in sunlight hit the solar panel and are absorbed by semiconducting materials, such as silicon. Electrons are knocked loose from their atoms, allowing them to flow through the material to produce electricity.
- Solar cells are often electrically connected and encapsulated as a module, in series, creating an additive voltage. The modules are connected in an array. The power output of an array is measured in watts or kilowatts, and typical energy needs are measured in kilowatt-hours.
- This system application can be considered for potential placement on additional buildings or areas such in parking lots, in overhead mounting and on the roofs.



## Renewable Energy Technologies: Solar Photovoltaic (cont'd)

Building	Faber Elementary School	Lincoln Middle School	Dunellen High School	Total
Locations to Install Panels	Roof	Roof	Roof	
Assumpt	ions		-	
System Capacity, kW-dc( maximum utilization of roof space)	20	11	32	63
Annual Electric Generation, kWhrs of AC electricity porduced	27,318	14,310	42,495	84,123
Total Annual Facility Electric Use, kWhrs	611,616	289,033	485,098	1,385,747
% of Total Annual Usage	4%	5%	9%	6%
All-In Cost of Electricity Year 1	\$0.155	\$0.158	\$0.167	\$0.160
Annaul Electric Cost Savings	\$4,245	\$2,258	\$7,091	\$13,594
Estimated SREC Value (Year 1)	\$100 / SREC	\$100 / SREC	\$100 / SREC	\$100 / SREC
Estimated year 1 SREC Revenue	\$2,732	\$1,431	\$4,250	\$8,412
Estimated Total Annual Revenue	\$6,977	\$3,689	\$11,341	\$22,006
Enviromenta	l Impact			
Equvilant Annual CO2 Emmison Reduction (tons per year)	9.0	4.7	14.0	27.8
Equvilant Cars Removed From Road Anually	2	1	2	5
Equvilant Acres of Tress Planted Annualy	2	1	4	8
Financial F	Results			
System Installed Cost	\$81,900	\$42,900	\$127,400	\$252,200
Simple Payback ( Years )	12	12	11	11
IRR (25 Years)	6%	7%	7%	7%
Net Present Value (25 yrs, 4% discount rate)	\$56,925	\$30,483	\$98,051	\$182,865
1.Estimated CO2 Emissions Rate: 0.66 lbs/kWh				
2.EPA Estimate: 11,560 CO2 per car				
3.EPA Estimate:7,333 lbs CO2 per acre of trees planted				



#### **Non-Financial Benefits of Solar PV**

The implementation of solar PV projects at Dunellen Public School would place your facilities at the forefront of renewable energy utilization. This allows the Dunellen School District the opportunity to not only gain experience with this energy technology, but also to win recognition as an environmentally sensitive, socially conscience institution. Additionally, these projects could be incorporated into science education and additional curriculums to raise awareness of current energy alternatives to the younger generations.





# Renewable Energy Technologies: CHP/Cogeneration

- CHP (combined heat and power) or cogeneration is the use of a heat engine to simultaneously generate both electricity and useful heat.
- Fuel Cells are electrochemical conversion devices that operate by catalysis, separation the protons and the electrons of the reactant fuel, and forcing the electrons to travel through a circuit to produce electricity. The catalyst is typically a platinum group metal or alloy. Another catalytic process takes the electrons back in, combining them with the protons and oxidant, producing waste products (usually water and carbon dioxide).
- Microturbines are rotary engines that extract energy from a flow of combustion gas. They can be used with absorption chillers to provide cooling through waste heat rather than electricity. Microturbines are best suited for facilities with year-round thermal and/or cooling loads.
- Not recommended for Dunellen Public Schools due to the lack of thermal requirements in the summertime.



- Accounts and Rate Class: Dunellen BOE has four facilities included in this study. Each facility is served by one or two electric accounts behind Public Service Electric Gas Company (PSEG) under rate classes Large Power and Lighting service (LPLS).
- Electric Consumption and Cost: Based on the one-year period studied, the total annual electric expenditure for the District is about \$215,905 and the total annual consumption is about 1,358,747 kilowatt-hours (kWh).
- Average/Effective Rate per kWh: For the one year period studied, the District's average monthly cost per kilowatt-hour ranged from \$0.155/kWh to \$0.167/kWh, inclusive of utility delivery charges. The District's overall average cost per kilowatt-hour during this period was 15.60¢/kWh.
- Third Party Supplier: Currently, Direct Energy is the third party supplier for the Dunellen Public Schools. A copy of the TPS contract was not available during the survey. Based on utility analysis, the TPS rate for electric commodity supply \$0.0961/kWh. Although not urgent, Dome-Tech recommends reviewing the current rate and market rate.
  - Note that these average electric rates are "all-inclusive"; that is, they include all supply service (generation and commodity-related) charges, as well as all delivery service charges. The supply service charges typically represent the majority (60-80%) of the total monthly bill. It is the supply portion of your bill that is deregulated, which is discussed on subsequent slides in this section.



- Accounts and Rate Class: BOE has three facilities. Each facility has one natural gas account with service behind Public Service Electric Gas Company (PSEG) under Large Volume Gas (LVG) rate class with Firm Transportation.
- Natural Gas Consumption and Cost: Based on the one-year period studied, the total annual natural gas expenditure for the District is about \$93,321 and the total annual consumption is about 101,120 therms. Natural Gas is used largely in winter for space heating purposes.
- Average/Effective Rate per Therm: For the one year period studied, the District's overall, average cost is \$0.923 per therm.
- Third Party Supplier: Currently, HESS Energy is the third party natural gas supplier for Dunellen Public Schools. A copy of the TPS contract was not available during the survey. Based on the utility analysis, the TPS rate for natural gas commodity is \$0.567/Therm. This rate is inline with the current market rate. Dome-Tech recommends periodically reviewing the market in order to compare the current rates.
  - Note that these average gas rates are "all-inclusive"; that is, they include all supply service (generation and commodity-related) charges, as well as all delivery service charges. The supply service charges typically represent the majority (60-80%) of the total monthly bill. It is the supply portion of your bill that is deregulated, which is discussed on subsequent slides in this section.



- To learn more about energy deregulation, visit the New Jersey Board of Public Utilities website: <u>www.bpu.state.nj.us</u>
- For more information about the retail energy supply companies that are licensed and registered to serve customers in New Jersey, visit the following website for more information: <u>http://www.bpu.state.nj.us/bpu/commercial/shopping.html</u>
- > Provided below is a list of NJ BPU-licensed retail energy suppliers:

Company	Electricity	Natural Gas	Website
Hess	X	X	hess.com
Sprague	Х	Х	spragueenergy.com
UGI	Х	Х	ugienergyservices.com
South Jersey Energy	Х	Х	southjerseyenergy.com
Direct	Х	Х	directenergy.com
Global	Х	Х	globalp.com
Liberty	Х		libertypowercorp.com
Reliant / NRG	Х		reliant.com
First Energy	X		fes.com
ConEd Solutions	Х		conedsolutions.com
Constellation / Exelon	Х	Х	newenergy.com
Glacial	X		glacialenergy.com
Integrys	Х		integrysenergy.com
Suez	Х		suezenergyresources.com
Sempra	Х		semprasolutions.com
Woodruff		Х	woodruffenergy.com
NextEra	X		mxenergy.com
Hudson		Х	hudsonenergyservices.com
Great Eastern		X	greateasterngas.com

\*Note: Not every Supplier serves customers in all utility territories within New Jersey. Please refer to the BPU website for current supplier list.



### Utility Deregulation in New Jersey: Background and Retail Energy Purchasing

### Electric Accounts:

- In August 2003, per the Electric Discount and Energy Competition Act [N.J.S.A. 48:3-49], the State of New Jersey deregulated its electric marketplace thus making it possible for customers to shop for a third-party (someone other than the utility) supplier of retail electricity.
- Per this process, every single electric account for every customer in New Jersey was placed into one of two categories: "BGS-FP" or "BGS-CIEP". BGS-FP stands for Basic Generation Service-Fixed Price; BGS-CIEP stands for Basic Generation Service-Commercial and Industrial Energy Pricing.
- At its first pass, this categorization of accounts was based on rate class. The largest electric accounts in the State (those served under a Primary or a Transmission-level rate class) were moved into BGS-CIEP pricing. All other accounts (the vast majority of accounts in the State of New Jersey, including residential) were placed in the BGS-FP category, receiving default electric supply service from the utility.
- The New Jersey Board of Public Utilities (NJBPU) has continued to move new large energy users from the BGS-FP category into the BGS-CIEP category by lowering the demand (kW) threshold for electric accounts receiving Secondary service. Originally, this threshold started at 1,500kW; now, it has come down to 750 kW. So, if an account's "peak load contribution" (as assigned by the utility) is less than 750 kW, then that facility/account is in the BGS-FP category. If you are unsure, you may contact Dome-Tech for assistance.



### Utility Deregulation in New Jersey: Background and Retail Energy Purchasing (cont'd)

- > There are at least 3 important differentiating factors to note about each rate category:
  - 1. The <u>rate structure</u> for BGS-FP accounts is different than the rate structure for BGS-CIEP accounts.
  - 2. The "do-nothing" option (i.e., what happens when you don't shop for retail energy) varies.
  - 3. The decision about whether, and why, to shop for a retail provider varies.
- **BGS-FP:** Secondary (small to medium) Electric Accounts:
  - BGS-FP rate schedules for all utilities are set, and re-set, each year. Per the results of our State's BGS Auction process, held each February, new utility default rates go into effect every year on June 1st. The BGS-FP rates become each customer's default rates, and they dictate a customer's "Price to Compare" (benchmark) for shopping purposes. To learn more about the BGS Auction process, please go to <u>www.bgs-auction.com</u>.
  - A customer's decision about whether to buy energy from a retail energy supplier is, therefore, predominantly dependent upon whether a supplier can offer rates that are lower than the utility's (default) Price to Compare.

#### **BGS-CIEP:** Primary (large) Electric Accounts:

- > The BGS-CIEP category is quite different. These accounts pay an hourly market rate for energy when they do not switch to a retail provider.
- > For BGS-CIEP accounts, the process of setting forth a buying strategy can be complex, which is why many public entities seek professional assistance when shopping for energy.
- For more information concerning hourly electric market prices for our region, please refer to <u>www.pjm.com</u>.



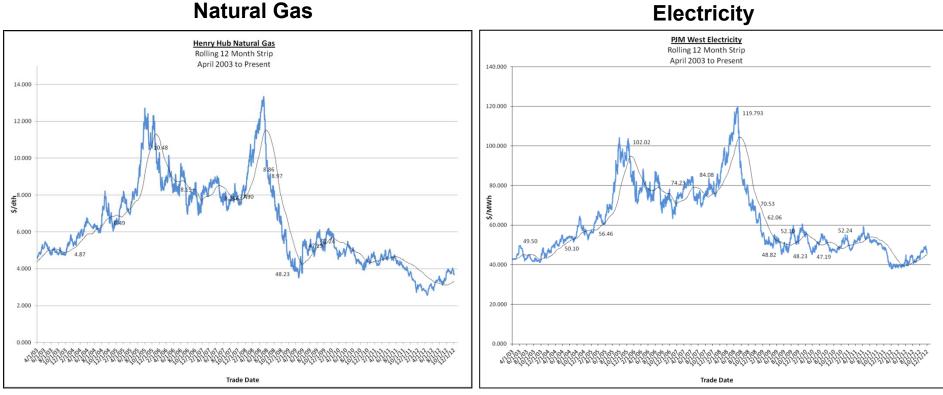
### Utility Deregulation in New Jersey: Background and Retail Energy Purchasing (cont'd)

### Natural Gas Accounts:

- The natural gas market in New Jersey is also deregulated. Most customers that remain with the utility for natural gas service pay rates that are market-based and that fluctuate on a monthly basis. While natural gas is a commodity that is exceptionally volatile and that is traded minute-by-minute during open trading sessions, market rates are "settled" monthly, 3 business days prior to the subsequent month (this is called the "prompt month"). Customers that do not shop for a natural gas supplier will typically pay this monthly settlement rate to the utility, plus other costs that are necessary to bring gas from Louisiana (The "Henry Hub") up to New Jersey (at the "City Gate") and ultimately to your facility.
- For additional information about natural gas trading and current market futures rates for various commodities, you can refer to <u>www.nymex.com</u>.
- A customer's decision about whether to buy natural gas from a retail supplier is typically dependent upon whether a customer seeks budget certainty and/or longer-term rate stability. Customers can secure longer-term fixed prices by enlisting a retail natural gas supplier. Many larger natural gas customers also seek the assistance of a professional consultant to assist in their procurement process.



Below please find graphs that show the last ten years' worth of market settlement prices for both natural gas and electricity. Each of these graphs shows the average closing prices of a rolling 12-month period of energy futures prices. The graphs are representative of the commodity alone; they do not include any of the additional components (capacity, transmission, ancillary services, etc.) that comprise a retail energy price. They are meant to provide an indication of the level of pricing that a particular customer might expect to see, but the graphs do not account for the specific load profile of any individual energy user.



Dunellen Public School District, NJ



Through the NJ Clean Energy Program, the New Jersey Board of Public Utilities currently offers a variety of subsidies or rebates for many of the project types outlined in this report. More detailed information can be found at: <u>www.njcleanenergy.com</u>

- NJ Smart Start Buildings Equipment Rebates noted in ECMs where available. Equipment Rebates: Water Heaters, Lighting, Lighting Controls/Sensors, Chillers, Boilers, Heat Pumps, Air Conditioners, Energy Management, Systems/Building Controls, Motor-ASDs/VSDs, Custom/Others. <u>http://www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/nj-smartstartbuildings</u>
- Pay for Performance Program Performance-Based Incentives for installations. Provides incentives of up to \$0.11/ kWh and \$1.25/ therm saved; up to 25% of total project cost. A minimum reduction target of 15% compared to baseline must be achieved. Energy modeling of building and systems and energy reduction plan is required (incentives provided to pay for part of study costs). http://www.njcleanenergy.com/commercial-industrial/programs/pay-performance/existing-buildings
- Energy Savings Improvement Program (ESIP) Public entities can contract with energy saving companies (ESCO) in up to 20-year lease purchases enabling public entities to implement energy conservation measures at their facilities, and pay for the costs using the value of energy savings that result from the improvements. A "Do It Yourself" approach allows the public entity to contract with an engineering firm(s) to develop an Energy Savings Plan, develop plans and specs, oversee construction, commissioning, etc. (No ESCO is needed for the Do It Yourself approach). http://www.njcleanenergy.com/commercial-industrial/programs/energy-savings-improvement-program



Direct Install Program – NJ Clean Energy makes the investment in energy efficiency upgrades by initially covering 70% of the cost to install the recommended energy efficiency measures (up to \$75,000 per project). If eligible, the entity will pay ONLY 30% of the total cost to install the energy efficiency measures.

http://www.njcleanenergy.com/commercial-industrial/programs/direct-install

#### We encourage you to contact the program directly for further information

#### Steps to Participate for Buildings:

#### 1. CONTACT THE PARTICIPATING CONTRACTOR IN YOUR AREA

<u>Identify the contractor</u> assigned and trained to provide Direct Install services in the county where your project is located. Using the contact information provided, call or email the Participating Contractor to discuss your project. The contractor will schedule an Energy Assessment and work with you to complete the Program Application and Participation Agreement. If you're unable to contact the Participating Contractor or have questions, you may contact us at 866-NJSMART or send an e-mail to <u>DirectInstall@trcsolutions.com</u>.

#### 2. REVIEW RESULTS

After the Energy Assessment, the contractor will review results with you, including what measures qualify and your share of the project cost.

#### 3. DECIDE TO MOVE FORWARD

You will sign a Scope of Work document to proceed with implementation of qualifying measures.

#### 4. ARRANGE INSTALLATION

You and the Participating Contractor will set a convenient start date for the installation.

#### 5. CONFIRM INSTALLATION

Once the Participating Contractor completes the installation, you accept the work by signing a Project Completion Form. A program representative will approve the project as complete.

#### 6. COMPLETE TRANSACTION

You pay the Participating Contractor your share of the project cost and the program pays its share.



### > The following projects should be considered for implementation:

- > Address Operation and Maintenance Issues
- > Computer Power Management
- > CRT Monitor Replacement
- > Upgrade Lighting Equipment and Controls
- Kitchen Exhaust Hood Controls
- Install De-stratification Fans
- Hot Water Booster Heater
- Demand Controlled Ventilation
- > Exhaust Fan timer and controls

Note that additional "Phase 2" engineering may be required to further develop these project - to bring them to bidding and implementation.

### Consider applying for a Pay-For-Performance Program or Energy Savings Improvement Program

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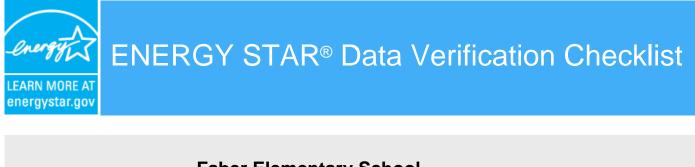
www.dome-tech.com



510 Thornall Street, Suite 170 Edison, NJ 08837 Tel: 732.590.0122 Fax: 732.590.0129

### PORTFOLIO MANAGER / ENERGY STAR

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**Faber Elementary School** 

Primary Function: K-12 School Gross Floor Area (ft<sup>2</sup>): 89,203 Built: 1910

ENERGY STAR ® Score<sup>1</sup> For Year Ending: 11/30/2013 Date Generated: 03/10/2014

1. The ENERGY STAR score is a 1-to-100 assessment of a building's energy efficiency as compared with similar building nationwide, adjusting for climate and business activity.

#### **Property & Contact Information**

Property Address Faber Elementary School High & amp; Lehigh Streets Dunellen, New Jersey 08812 Property Owner Dunellen Public Schools High & Amp; Lehigh Streets Dunellen, NJ 08812 (\_\_\_) - Primary Contact Brian Delucia High & amp; Lehigh Streets Dunellen, NJ 08812 732 968 3226 deluciab@dunellenschools.org

#### Property ID: 3927288

#### **1. Review of Whole Property Characteristics**

Basic Property Information	
<ol> <li>Property Name: Faber Elementary School Is this the official name of the property?</li> </ol>	☐ Yes ☐ No
If "No", please specify:	
2) Primary Function: K-12 School Is this an accurate description of the primary use of this property?	☐ Yes ☐ No
<ul> <li>3) Location:</li> <li>High &amp; Lehigh Streets</li> <li>Dunellen, New Jersey 08812</li> </ul>	🗌 Yes 🗌 No
Is this correct and complete?	
4) Gross Floor Area: 89,203 ft <sup>2</sup>	🗌 Yes 🔄 No

Does this represent the entire property? (i.e., no part of the building/property was excluded/subtracted from the total) If "no" please specify what space has been excluded.		
5) Annual Occupancy: 100 Is this occupancy accurate for the entire 12 month period being assessed?	🗌 Yes	□ No
6) Number of Buildings: 1 Does this number accurately represent all structures?	🗌 Yes	🗌 No
Notes:		

Indoor Environmental Standards		
1) Ventilation for Acceptable Indoor Air Quality Does this property meet the ASHRAE Standard 62 for ventilation for acceptable indoor air quality?	☐ Yes	🗌 No
2) Acceptable Thermal Environmental Conditions Does this property meet the ASHRAE Standard 55 for thermal comfort?	🗌 Yes	🗌 No
3) Adequate Illumination Does this property adhere to the IESNA Lighting Handbook for lighting quality?	🗌 Yes	🗌 No
Notes:		

#### 2. Review of Property Use Details

K-12 School: Building Use			
1) Gross Floor Area: 89,203 ft <sup>2</sup> Is this the total size, as measured between the principal exterior surfaces of the enclosing fixed walls of the building(s)? This includes all areas inside the building(s) such as: occupied tenant areas, common areas, meeting areas, break rooms, restrooms, elevator shafts, mechanical equipment areas, and storage rooms. Gross	☐ Yes	🗌 No	

	Floor Area should not include interstitial plenum space between floors, which may house pipes and ventilation. Gross Floor Area is not the same as rentable, but rather includes all area inside the building(s). Leasable space would be a sub-set of Gross Floor Area. In the case where there is an atrium, you should count the Gross Floor Area at the base level only. Do not increase the size to accommodate open atrium space at higher levels. The Gross Floor Area should not include any exterior spaces such as balconies or exterior loading docks and driveways.		
2)	Gymnasium Floor Area: 0 ft <sup>2</sup>		
	Does the gymnasium floor area include all areas devoted to a gymnasium, including gymnasium/athletic areas, spectator areas, locker rooms, and other associated spaces?	🗌 Yes	No
3)	High School: No		
	Is the property a high school (teaching grades 10, 11, and/or 12)? If the property teaches to high school students at all, the user should check 'yes' to 'high school'. For example, if the school teaches to grades K-12 (elementary/middle and high school), the user should check 'yes' to 'high school'.	☐ Yes	🗌 No
4)	Number of Workers on Main Shift: 79		
	Is this the number of workers present during the main shift? Note that this is not a total count of workers, but rather a count of workers who are present at the same time. For example, if there are two daily eight hour shifts of 100 workers each, the Number of Workers on Main Shift value is 100. Number of Workers on Main Shift may include employees of the property, sub-contractors who are onsite regularly, and volunteers who perform regular onsite tasks. Number of Workers should not include visitors to the buildings such as clients, customers, or patients.	☐ Yes	<u> </u>
5)	Student Seating Capacity: 650		
	Is this the maximum number of students for which the school was designed? This should include the seating capacity of the entire school. If portable classrooms have been added to the school, include the capacity of these classrooms, as they expand the overall capacity of the school.	☐ Yes	🗌 No
6)	Months in Use: 9		
7)	Is this the total number of months that the property is open for standard activities?	Yes	No
()	Weekend Operation: No		
	Does the property include regular activities on the weekend beyond the scope of maintenance, cleaning, and security personnel? Weekend activity could include any time when the property is used for classes, performances, or other school or community activities. The Yes selection is appropriate for any property that is open on one or both days of the weekend during one or more seasons of the year.	Yes	<u> </u>
8)	Number of Computers: 116		
	Is this the total number of desktop computers, laptops, and data servers at the property? This number should not include tablet computers, such as iPads, or any other types of office equipment. The count should only reflect computers that are owned by the school. It should not include any computers that are brought onsite by students or staff.	Yes	🗌 No
9)	Cooking Facilities: 100% Yes		
	Does the property have a commercial cooking area designed to provide and serve food to occupants and/or visitors? This may include restaurants and cafeterias. If the property contains only employee break room kitchens, this field should be marked No.	🗌 Yes	No

10) Number of Walk-in Refrigeration/Freezer Units: 1			
Is this the total count of walk-in units at the property? Walk-in Refrigeration/Freezers are typically very large units located in storage areas or commercial kitchens that would not be accessible to all building occupants. This count should only include large storage units that a person actually walks into in order to store or retrieve perishable goods.	☐ Yes	☐ No	
11) Percent That Can Be Heated: 90			
Is this the total percentage of the property that can be heated by mechanical equipment?	Yes	No	
12) Percent That Can Be Cooled: 20			
Is this the total percentage of the property that can be cooled by mechanical equipment? This includes all types of cooling from central air to individual window units.	🗌 Yes	🗌 No	
13) School District: Dunellen School District			
Is this the administrative school district in which the property is located?	🗌 Yes	No	
Notes:			

#### 3. Review of Energy Consumption

Data Overview			
Site Energy Use Summary		National Median Comparison	
Electric - Grid (kBtu)	2,058,311.5 (33%)	National Median Site EUI (kBtu/ft <sup>2</sup> )	55.2
Natural Gas (kBtu)	4,157,319.7 (67%)	National Median Source EUI (kBtu/ft <sup>2</sup> )	96.1
Total Energy (kBtu)	6,215,631.1	% Diff from National Median Source	26.33%
Energy Intensity			
Site (kBtu/ft <sup>2</sup> )	69.7	Emissions (based on site energy use)	
Source (kBtu/ft <sup>2</sup> )	121.4	Greenhouse Gas Emissions (MtCO2e)	481.3
		<b>Power Generation Plant or Distribution</b> Public Service Electric & Gas Co	Utility:

Note: All values are annualized to a 12-month period. Source Energy includes energy used in generation and transmission to enable an equitable assessment.

#### **Summary of All Associated Meters**

The following meters are associated with the property, meaning that they are added together to get the total energy use for the property. Please see additional tables in this checklist for the exact meter consumption values.

Meter Name	Fuel Type	Start Date	End Date	Associated With
Natural Gas - 2523055	Natural Gas	01/01/2012	In Use	Faber Elementary School

Meter Name	Fuel Type	Start Date	End Date	Asso	ciated With
Electric Grid Meter #778012113	Electric	01/01/2012	In Use	Faber Schoo	r Elementary ol
Electric Meter (Area lighting)	Electric	01/01/2012	In Use	Faber Schoo	r Elementary ol
Total Energy Use Do the meters shown reporting period of th		al energy use of this prope	erty during the	☐ Yes	🗌 No
Additional Fuels Do the meters above include all fuel <i>types</i> at the property? That is, no additional fuels such as district steam, generator fuel oil have been excluded.			🗌 Yes	🗌 No	
On-Site Solar and Wir Are all on-site solar a must be reported.		rted in this list (if present)?	All on-site systems	Yes	🗌 No
Notes:					

#### Natural Gas Meter: Natural Gas - 2523055 (therms)

Associated With: Faber Elementar	•	
Start Date	End Date	Usage
11/27/2012	12/27/2012	5,592
12/27/2012	01/28/2013	7,670
01/28/2013	02/27/2013	6,256
02/27/2013	03/28/2013	10,049
03/28/2013	04/29/2013	3,331
04/29/2013	05/28/2013	700
05/28/2013	06/27/2013	755
06/27/2013	07/27/2013	200
07/27/2013	08/28/2013	210
08/28/2013	09/26/2013	367

Start Date	End Date	Usage			
09/26/2013	10/25/2013	1,051			
10/25/2013	11/26/2013	4,939.57			
11/26/2013	12/27/2013	7,429			
	Total Consumption (therms):	48,549.57			
	Total Consumption (kBtu (thousand Btu)):	4,854,957			
Total Energy Consumption for t Do the fuel consumption totals show	otal Energy Consumption for this Meter				
through this meter that affect energy (i.e., do the entries match the utility					
Notes:					

#### Electric Meter: Electric Grid Meter #778012113 (kWh (thousand Watt-hours))

Associated With: Faber E	elementary School		
Start Date	End Date	Usage	Green Power?
11/20/2012	12/21/2012	44,200	No
12/21/2012	01/22/2013	42,400	No
01/23/2013	02/22/2013	50,615	No
02/22/2013	03/25/2013	51,121	No
03/25/2013	04/24/2013	44,415	No
04/24/2013	05/23/2013	48,736	No
05/23/2013	06/24/2013	59,091	No
06/24/2013	07/24/2013	56,152	No
07/24/2013	08/22/2013	33,682	No
08/22/2013	09/23/2013	52,904	No
09/23/2013	10/22/2013	51,020	No
10/22/2013	11/20/2013	46,309	No
11/20/2013	12/23/2013	50,971	No
	Total Consumption Watt-hours)):	n (kWh (thousand	631,616
	Total Consumption Btu)):	n (kBtu (thousand	2,155,073.8

Total Energy Consumption for this Meter Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?	☐ Yes	□ No
Notes:		

#### Electric Meter: Electric Meter (Area lighting) (kWh (thousand Watt-hours))

ociated With: Faber E	•		
Start Date	End Date	Usage	Green Power?
12/01/2012	01/02/2013	2,415	No
01/03/2013	01/31/2013	2,083	No
02/01/2013	03/04/2013	2,102	No
03/05/2013	04/03/2013	1,772	No
04/04/2013	05/02/2013	1,515	No
05/03/2013	06/03/2013	1,492	No
06/04/2013	07/02/2013	1,269	No
07/03/2013	08/01/2013	1,361	No
08/02/2013	08/30/2013	1,455	No
08/31/2013	10/01/2013	1,823	No
10/02/2013	10/30/2013	1,850	No
10/31/2013	12/02/2013	2,308	No
	Total Consumptio Watt-hours)):	n (kWh (thousand	21,445
	Total Consumptio Btu)):	n (kBtu (thousand	73,170.3
al Energy Consumptio	n for this Meter		🗌 Yes 🗌 No
through this meter that affect	als shown above include consump at energy calculations for the report e utility bills received by the prope	ting period of this application	

Notes:			

#### 4. Signature & Stamp of Verifying Licensed Professional

\_\_\_\_\_ (Name) visited this site on \_\_\_\_\_ (Date). Based on the conditions observed at the time of the visit to this property, I verify that the information contained within this application is accurate and in accordance with the Licensed Professional Guide.

ſ

Signature:	_ Date:	
Licensed Professional		
, , ()		
<b>NOTE:</b> When applying for the ENERG	V STAR the signature of the	

Professional Engineer Stamp (if applicable)

**NOTE:** When applying for the ENERGY STAR, the signature of the Verifying Professional must match the stamp.



# **ENERGY STAR<sup>®</sup> Progress & Goals Report**



#### **Faber Elementary School**

Primary Property Function: K-12 School Gross Floor Area (ft<sup>2</sup>): 89,203 Built: 1910

ENERGY STAR® Score<sup>1</sup>

#### For Year Ending: November 30, 2013 Date Generated: March 10, 2014

Property Address: Faber Elementary School High & amp; Lehigh Streets Dunellen, New Jersey 08812

Property ID: 3927288

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

#### Performance Comparison

		Progress			Performance Goals	
	<b>Year Ending</b> <b>10/31/2013</b> (Baseline)	Year Ending 11/30/2013 (Selected)	% Change	Property's Target	National Median	ENERGY STAR Score of 75
ENERGY STAR Score	26	24	-8	Not Set	50	75
Energy						
Site EUI (kBtu/ft <sup>2</sup> )	68.1	69.7	-2.3	Not Set	55.2	43.1
Source EUI (kBtu/ft <sup>2</sup> )	119.3	121.4	-1.73	Not Set	96.1	75.1
\$	0	0	N/A	Not Set	0	0
\$/ft <sup>2</sup>	0	0	N/A	Not Set	0	0
Greenhouse Gas Emissions						
MtCO2e/year	472.3	481.3	1.91	Not Set	381.3	297.6
kgCO2e/ ft2/year	5.3	5.4	1.91	Not Set	4.3	3.3
Water						
All Water Consumption (kgal)	N/A	N/A	N/A	*	*	*
Indoor Water Consumption (kgal)	N/A	N/A	N/A	*	*	*
Indoor Water Consumption (kgal/ft <sup>2</sup> )	N/A	N/A	N/A	*	*	*
\$	N/A	N/A	N/A	*	*	*

\*Setting and managing water targets is not yet available in Portfolio Manager.



## ENERGY STAR<sup>®</sup> Scorecard



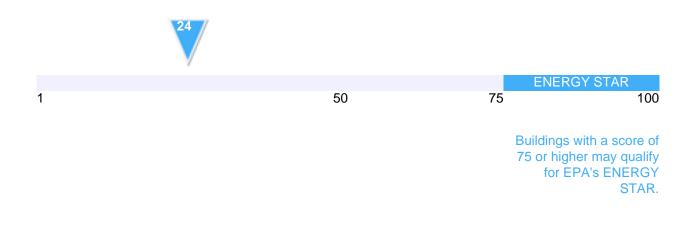
ENERGY STAR® Score

#### **Faber Elementary School**

Primary Function: K-12 School Gross Floor Area (ft<sup>2</sup>): 89,203 Built: 1910

For Year Ending: November 30, 2013 Date Generated: March 10, 2014 Property Address: Faber Elementary School High & amp; Lehigh Streets Dunellen, New Jersey 08812

For the year ending in November 2013, this building used 121.4 (kBtu/ft<sup>2</sup>) on a source energy basis. The Environmental Protection Agency's (EPA's) ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.



#### **Signature of Verifying Professional**

I \_\_\_\_\_\_ (Name) verify that the information regarding energy use and property use details is true and correct to the best of my knowledge.

Signature: \_\_\_\_\_Date: \_\_\_\_\_



#### **ENERGY STAR<sup>®</sup> Statement of Energy Performance**





#### **Faber Elementary School**

Primary Property Function: K-12 School Gross Floor Area (ft<sup>2</sup>): 89,203 Built: 1910



For Year Ending: November 30, 2013 Date Generated: March 10, 2014

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property &	Contact	Information	
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**Property Address** Faber Elementary School High & amp; Lehigh Streets Dunellen, New Jersey 08812 Property Owner Dunellen Public Schools High & amp; Lehigh Streets Dunellen, NJ 08812 \_)\_\_\_-

**Primary Contact** Brian Delucia High & amp; Lehigh Streets Dunellen, NJ 08812 732 968 3226 deluciab@dunellenschools.org

#### Property ID: 3927288

Energy Consumption and Energy Use Intensity (EUI)						
Site EUI	Annual Energy by Fu	lel	National Median Comparison			
69.7 kBtu/ft <sup>2</sup>	Electric - Grid (kBtu)	2,058,312 (33%)	National Median Site EUI (kBtu/ft <sup>2</sup> )	55.2		
09.7 KDIU/IL-	Natural Gas (kBtu)	4,157,320 (67%)	National Median Source EUI (kBtu/ft <sup>2</sup> )	96.1		
	· · ·		% Diff from National Median Source EUI	26%		
Source EUI			Annual Emissions			
121.4 kBtu/ft	2		Greenhouse Gas Emissions (MtCO2e/year)	481		

#### Signature & Stamp of Verifying Professional

I (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: \_\_\_\_\_Date: \_\_\_\_\_

Licensed Professional

\_\_)\_\_\_--

**Professional Engineer Stamp** (if applicable)

ENERGY STAR® Data Verification Checklist energystar.gov

# 13

#### Lincoln Middle School

Primary Function: K-12 School Gross Floor Area (ft<sup>2</sup>): 26,248 Built: 1960

ENERGY STAR ® Score<sup>1</sup> For Year Ending: 10/31/2013 Date Generated: 03/10/2014

1. The ENERGY STAR score is a 1-to-100 assessment of a building's energy efficiency as compared with similar building nationwide, adjusting for climate and business activity.

#### **Property & Contact Information**

Property Address Lincoln Middle School 400 Dunellen Avenue Dunellen, New Jersey 08812

Property ID: 3927290

Property Owner Dunellen Public Schools High & amp; Lehigh Streets Dunellen, NJ 08812 (\_\_\_) - Primary Contact Brian Delucia High & Lehigh Streets Dunellen, NJ 08812 732 968 3226 deluciab@dunellenschools.org

# 1. Review of Whole Property Characteristics

· ·		
Basic Property Information		
<ol> <li>Property Name: Lincoln Middle School Is this the official name of the property?</li> <li>If "No", please specify:</li> </ol>	🗌 Yes	🗌 No
2) Primary Function: K-12 School Is this an accurate description of the primary use of this property?	☐ Yes	🗌 No
<ul> <li>3) Location:</li> <li>400 Dunellen Avenue</li> <li>Dunellen, New Jersey 08812</li> </ul>	☐ Yes	🗌 No
Is this correct and complete?		
4) Gross Floor Area: 26,248 ft <sup>2</sup>	🗌 Yes	No No

Does this represent the entire property? (i.e., no part of the building/property was excluded/subtracted from the total) If "no" please specify what space has been excluded.		
5) Annual Occupancy: 100 Is this occupancy accurate for the entire 12 month period being assessed?	🗌 Yes	□ No
6) Number of Buildings: 1 Does this number accurately represent all structures?	🗌 Yes	🗌 No
Notes:		

Indoor Environmental Standards		
<ol> <li>Ventilation for Acceptable Indoor Air Quality</li> <li>Does this property meet the ASHRAE Standard 62 for ventilation for acceptable indoor air quality?</li> </ol>	🗌 Yes	No
2) Acceptable Thermal Environmental Conditions Does this property meet the ASHRAE Standard 55 for thermal comfort?	🗌 Yes	🗌 No
3) Adequate Illumination Does this property adhere to the IESNA Lighting Handbook for lighting quality?	🗌 Yes	No
Notes:		

#### 2. Review of Property Use Details

K-12 School: Building Use			
1) Gross Floor Area: 26,248 ft <sup>2</sup> Is this the total size, as measured between the principal exterior surfaces of the enclosing fixed walls of the building(s)? This includes all areas inside the building(s) such as: occupied tenant areas, common areas, meeting areas, break rooms, restrooms, elevator shafts, mechanical equipment areas, and storage rooms. Gross	☐ Yes	No	

	Floor Area should not include interstitial plenum space between floors, which may house pipes and ventilation. Gross Floor Area is not the same as rentable, but rather includes all area inside the building(s). Leasable space would be a sub-set of Gross Floor Area. In the case where there is an atrium, you should count the Gross Floor Area at the base level only. Do not increase the size to accommodate open atrium space at higher levels. The Gross Floor Area should not include any exterior spaces such as balconies or exterior loading docks and driveways.		
2)	Gymnasium Floor Area: 0 ft <sup>2</sup>		
	Does the gymnasium floor area include all areas devoted to a gymnasium, including gymnasium/athletic areas, spectator areas, locker rooms, and other associated spaces?	☐ Yes	No
3)	High School: No		
	Is the property a high school (teaching grades 10, 11, and/or 12)? If the property teaches to high school students at all, the user should check 'yes' to 'high school'. For example, if the school teaches to grades K-12 (elementary/middle and high school), the user should check 'yes' to 'high school'.	☐ Yes	🗌 No
4)	Number of Workers on Main Shift: 20		
	Is this the number of workers present during the main shift? Note that this is not a total count of workers, but rather a count of workers who are present at the same time. For example, if there are two daily eight hour shifts of 100 workers each, the Number of Workers on Main Shift value is 100. Number of Workers on Main Shift may include employees of the property, sub-contractors who are onsite regularly, and volunteers who perform regular onsite tasks. Number of Workers should not include visitors to the buildings such as clients, customers, or patients.	☐ Yes	☐ No
5)	Student Seating Capacity: 262.48		
	Is this the maximum number of students for which the school was designed? This should include the seating capacity of the entire school. If portable classrooms have been added to the school, include the capacity of these classrooms, as they expand the overall capacity of the school.	☐ Yes	🗌 No
6)	Months in Use: 9		
7\	Is this the total number of months that the property is open for standard activities?	Yes	No
()	Weekend Operation: No		
	Does the property include regular activities on the weekend beyond the scope of maintenance, cleaning, and security personnel? Weekend activity could include any time when the property is used for classes, performances, or other school or community activities. The Yes selection is appropriate for any property that is open on one or both days of the weekend during one or more seasons of the year.	Yes	<u> </u>
8)	Number of Computers: 26		
	Is this the total number of desktop computers, laptops, and data servers at the property? This number should not include tablet computers, such as iPads, or any other types of office equipment. The count should only reflect computers that are owned by the school. It should not include any computers that are brought onsite by students or staff.	☐ Yes	🗌 No
9)	Cooking Facilities: 100% Yes		
	Does the property have a commercial cooking area designed to provide and serve food to occupants and/or visitors? This may include restaurants and cafeterias. If the property contains only employee break room kitchens, this field should be marked No.	🗌 Yes	□ No

10) Number of Walk-in Refrigeration/Freezer Units: 1		
Is this the total count of walk-in units at the property? Walk-in Refrigeration/Freezers are typically very large units located in storage areas or commercial kitchens that would not be accessible to all building occupants. This count should only include large storage units that a person actually walks into in order to store or retrieve perishable goods.	☐ Yes	🗌 No
11) Percent That Can Be Heated: 90		
Is this the total percentage of the property that can be heated by mechanical equipment?	☐ Yes	🗌 No
12) Percent That Can Be Cooled: 10		
Is this the total percentage of the property that can be cooled by mechanical equipment? This includes all types of cooling from central air to individual window units.	🗌 Yes	No
13) School District: Not entered		
<b>13) School District:</b> Not entered Is this the administrative school district in which the property is located?	☐ Yes	No
-	☐ Yes	<u> </u>
Is this the administrative school district in which the property is located?	☐ Yes	□ No
Is this the administrative school district in which the property is located?	☐ Yes	☐ No
Is this the administrative school district in which the property is located?	☐ Yes	<u> </u>

#### 3. Review of Energy Consumption

Data Overview			
Site Energy Use Summary		National Median Comparison	
Electric - Grid (kBtu)	870,334.4 (31%)	National Median Site EUI (kBtu/ft <sup>2</sup> )	73.8
Natural Gas (kBtu)	1,956,917.3 (69%)	National Median Source EUI (kBtu/ft <sup>2</sup> )	125
Total Energy (kBtu)	2,827,251.7	% Diff from National Median Source	45.92%
Energy Intensity			
Site (kBtu/ft <sup>2</sup> )	107.7	Emissions (based on site energy use)	
Source (kBtu/ft <sup>2</sup> )	182.4	Greenhouse Gas Emissions (MtCO2e)	214.1
		<b>Power Generation Plant or Distribution</b> Public Service Electric & Gas Co	Utility:

Note: All values are annualized to a 12-month period. Source Energy includes energy used in generation and transmission to enable an equitable assessment.

#### **Summary of All Associated Meters**

The following meters are associated with the property, meaning that they are added together to get the total energy use for the property. Please see additional tables in this checklist for the exact meter consumption values.

Meter Name	Fuel Type	Start Date	End Date	Associated With
Natural Gas - 2413079	Natural Gas	09/25/2012	In Use	Lincoln Middle School

Meter Name	Fuel Type	Start Date	End Date	Asso	ciated With
Electric Grid Meter - 778013091	Electric	12/20/2012	In Use	Linco	In Middle School
Total Energy Use				🗌 Yes	🗌 No
Do the meters show reporting period of the second s		tal energy use of this prope	erty during the		
Additional Fuels				🗌 Yes	No
	e include all fuel <i>types</i> at th rator fuel oil have been exc	ne property? That is, no ad cluded.	ditional fuels such as	_	
On-Site Solar and Wir	nd Energy			🗌 Yes	🗌 No
Are all on-site solar must be reported.	and wind installations repo	orted in this list (if present)?	All on-site systems		
Notes:					

#### Natural Gas Meter: Natural Gas - 2413079 (therms)

#### Associated With: Lincoln Middle School

Start Date	End Date	Usage
10/25/2012	11/15/2012	2,280.6
11/16/2012	12/18/2012	1,665.2
12/19/2012	01/18/2013	3,241.9
01/19/2013	02/19/2013	4,647.4
02/20/2013	03/20/2013	3,533.2
03/21/2013	04/19/2013	2,375.5
04/20/2013	05/21/2013	1,361.4
05/22/2013	06/19/2013	39.2
06/20/2013	07/19/2013	23.4
07/20/2013	08/19/2013	23.5
08/20/2013	09/18/2013	33.2
09/19/2013	10/17/2013	61.7

Start Date	End Date	Usage
10/17/2013	11/15/2013	1,950
	Total Consumption (therms):	21,236.2
	Total Consumption (kBtu (thousand Btu)):	2,123,620
Total Energy Consumption	for this Meter	🗌 Yes 🗌 No
through this meter that affect e	shown above include consumption of all energy tracked nergy calculations for the reporting period of this application utility bills received by the property)?	
Notes:		

#### Electric Meter: Electric Grid Meter - 778013091 (kWh (thousand Watt-hours))

#### Associated With: Lincoln Middle School

Start Date	End Date	Usage	Green Power?			
12/20/2012	01/15/2013	21,384	No			
01/15/2013	02/21/2013	21,699	No			
02/21/2013	03/22/2013	21,726	No			
03/22/2013	04/23/2013	23,908	No			
04/23/2013	05/22/2013	26,804	No			
05/22/2013	06/21/2013	30,165	No			
06/21/2013	07/23/2013	34,247	No			
07/23/2013	08/21/2013	19,978	No			
08/21/2013	09/20/2013	24,203	No			
09/20/2013	10/21/2013	23,219	No			
10/21/2013	11/19/2013	20,425	No			
Total Consumption (kWh (thousand 267,758 Watt-hours)):						
	Total Consumptio Btu)):	n (kBtu (thousand	913,590.3			
al Energy Consumptio	on for this Meter		□ Yes □ No			

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:			

#### 4. Signature & Stamp of Verifying Licensed Professional

\_\_\_\_\_ (Name) visited this site on \_\_\_\_\_ (Date). Based on the conditions observed at the time of the visit to this property, I verify that the information contained within this application is accurate and in accordance with the Licensed Professional Guide.

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Signature:	_ Date:
Licensed Professional	
, ()	
NOTE: When applying for the ENERG	V STAR the signature of the

Professional Engineer Stamp (if applicable)

**NOTE:** When applying for the ENERGY STAR, the signature of the Verifying Professional must match the stamp.



# **ENERGY STAR<sup>®</sup> Progress & Goals Report**



#### Lincoln Middle School

Primary Property Function: K-12 School Gross Floor Area (ft<sup>2</sup>): 26,248 Built: 1960

For Year Ending: October 31, 2013 Date Generated: March 10, 2014 Property Address: Lincoln Middle School 400 Dunellen Avenue Dunellen, New Jersey 08812

Property ID: 3927290

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Performance Comparison

Score<sup>1</sup>

		Progress			Performance Goals	
	<b>Year Ending</b> 9/30/2013 (Baseline)	Year Ending 10/31/2013 (Selected)	% Change	Property's Target	National Median	ENERGY STAR Score of 75
ENERGY STAR Score	17	13	-31	50	50	75
Energy						
Site EUI (kBtu/ft <sup>2</sup> )	103.7	107.7	-3.71	73.8	73.8	57.7
Source EUI (kBtu/ft2)	172	182.4	-5.7	125	125	97.7
\$	0	0	N/A	0	0	0
\$/ft <sup>2</sup>	0	0	N/A	0	0	0
Greenhouse Gas Emissions						
MtCO2e/year	202.8	214.1	5.57	146.7	146.7	114.7
kgCO2e/ ft2/year	7.7	8.2	5.57	5.6	5.6	4.4
Water						
All Water Consumption (kgal)	N/A	N/A	N/A	*	*	*
Indoor Water Consumption (kgal)	N/A	N/A	N/A	*	*	*
Indoor Water Consumption (kgal/ft <sup>2</sup> )	N/A	N/A	N/A	*	*	*
\$	N/A	N/A	N/A	*	*	*

\*Setting and managing water targets is not yet available in Portfolio Manager.



### **ENERGY STAR<sup>®</sup> Scorecard**

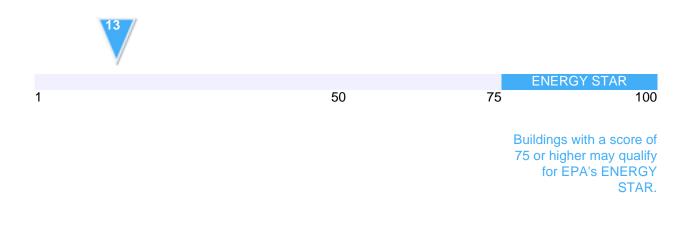


ENERGY STAR® Score Lincoln Middle School

Primary Function: K-12 School Gross Floor Area (ft<sup>22</sup>): 26,248 Built: 1960

For Year Ending: October 31, 2013 Date Generated: March 10, 2014 Property Address: Lincoln Middle School 400 Dunellen Avenue Dunellen, New Jersey 08812

For the year ending in October 2013, this building used 182.4 (kBtu/ft<sup>2</sup>) on a source energy basis. The Environmental Protection Agency's (EPA's) ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.



#### **Signature of Verifying Professional**

I \_\_\_\_\_\_ (Name) verify that the information regarding energy use and property use details is true and correct to the best of my knowledge.

Signature: \_\_\_\_\_Date: \_\_\_\_\_



# **ENERGY STAR<sup>®</sup> Statement of Energy**

**Performance** 



#### Lincoln Middle School

Primary Property Function: K-12 School Gross Floor Area (ft<sup>2</sup>): 26,248 Built: 1960

**ENERGY STAR®** Score<sup>1</sup>

For Year Ending: October 31, 2013 Date Generated: March 10, 2014

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property &	3	Contact	Information
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Property Address Lincoln Middle School 400 Dunellen Avenue Dunellen, New Jersey 08812 Property Owner Dunellen Public Schools High & amp; Lehigh Streets Dunellen, NJ 08812 \_)\_\_\_-

**Primary Contact Brian Delucia** High & amp; Lehigh Streets Dunellen, NJ 08812 732 968 3226 deluciab@dunellenschools.org

Property ID: 3927290

Energy Consumption and Energy Use Intensity (EUI)						
Site EUI	Annual Energy by Fu	iel	National Median Comparison			
107.7 kBtu/ft <sup>2</sup>	Electric - Grid (kBtu)	870,334 (31%)	National Median Site EUI (kBtu/ft <sup>2</sup> )	73.8		
107.7 KDIU/IL2	Natural Gas (kBtu)	1,956,917 (69%)	National Median Source EUI (kBtu/ft2)	125		
	· · · ·		% Diff from National Median Source EUI	46%		
Source EUI			Annual Emissions			
182.4 kBtu/ft <sup>2</sup>			Greenhouse Gas Emissions (MtCO2e/year)	214		

#### Signature & Stamp of Verifying Professional

\_\_\_\_\_ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: \_\_\_\_\_Date: \_\_\_\_\_

Licensed Professional

I \_\_\_\_

\_\_)\_\_\_--

**Professional Engineer Stamp** (if applicable)

ENERGY STAR® Data Verification Checklist



energystar.gov

ENERGY STAR ® Score<sup>1</sup>

#### **Dunellen High School**

Primary Function: K-12 School Gross Floor Area (ft<sup>2</sup>): 77,794 Built: 1930

For Year Ending: 10/31/2013 Date Generated: 03/10/2014

1. The ENERGY STAR score is a 1-to-100 assessment of a building's energy efficiency as compared with similar building nationwide, adjusting for climate and business activity.

#### **Property & Contact Information**

Property Address Dunellen High School 411 First Street Dunellen, New Jersey 08812

Property ID: 3927291

Property Owner Dunellen Public Schools High & amp; Lehigh Streets Dunellen, NJ 08812 (\_\_\_) - Primary Contact Brian Delucia High & amp; Lehigh Streets Dunellen, NJ 08812 732 968 3226 deluciab@dunellenschools.org

# 1. Review of Whole Property Characteristics

Basic Property Information		
<ul> <li><b>1) Property Name:</b> Dunellen High School</li> <li>Is this the official name of the property?</li> <li>If "No", please specify:</li> </ul>	☐ Yes ☐ No	
2) Primary Function: K-12 School Is this an accurate description of the primary use of this property?	🗌 Yes 🗌 No	
<ul> <li><b>3) Location:</b></li> <li>411 First Street</li> <li>Dunellen, New Jersey 08812</li> </ul>	🗌 Yes 🔄 No	
Is this correct and complete?		
4) Gross Floor Area: 77,794 ft <sup>2</sup>	🗌 Yes 🔄 No	

Does this represent the entire property? (i.e., no part of the building/property was excluded/subtracted from the total) If "no" please specify what space has been excluded.		
5) Annual Occupancy: 100 Is this occupancy accurate for the entire 12 month period being assessed?	🗌 Yes	□ No
6) Number of Buildings: 1 Does this number accurately represent all structures?	🗌 Yes	🗌 No
Notes:		

Indoor Environmental Standards		
<ol> <li>Ventilation for Acceptable Indoor Air Quality</li> <li>Does this property meet the ASHRAE Standard 62 for ventilation for acceptable indoor air quality?</li> </ol>	🗌 Yes	No
2) Acceptable Thermal Environmental Conditions Does this property meet the ASHRAE Standard 55 for thermal comfort?	🗌 Yes	🗌 No
3) Adequate Illumination Does this property adhere to the IESNA Lighting Handbook for lighting quality?	🗌 Yes	No
Notes:		

#### 2. Review of Property Use Details

K-12 School: Building Use			
1) Gross Floor Area: 77,794 ft <sup>2</sup> Is this the total size, as measured between the principal exterior surfaces of the enclosing fixed walls of the building(s)? This includes all areas inside the building(s) such as: occupied tenant areas, common areas, meeting areas, break rooms, restrooms, elevator shafts, mechanical equipment areas, and storage rooms. Gross	🗌 Yes	🗌 No	

	Floor Area should not include interstitial plenum space between floors, which may house pipes and ventilation. Gross Floor Area is not the same as rentable, but rather includes all area inside the building(s). Leasable space would be a sub-set of Gross Floor Area. In the case where there is an atrium, you should count the Gross Floor Area at the base level only. Do not increase the size to accommodate open atrium space at higher levels. The Gross Floor Area should not include any exterior spaces such as balconies or exterior loading docks and driveways.		
2)	Gymnasium Floor Area: 0 ft <sup>2</sup>		
	Does the gymnasium floor area include all areas devoted to a gymnasium, including gymnasium/athletic areas, spectator areas, locker rooms, and other associated spaces?	🗌 Yes	No
3)	High School: 100% Yes		
	Is the property a high school (teaching grades 10, 11, and/or 12)? If the property teaches to high school students at all, the user should check 'yes' to 'high school'. For example, if the school teaches to grades K-12 (elementary/middle and high school), the user should check 'yes' to 'high school'.	☐ Yes	🗌 No
4)	Number of Workers on Main Shift: 61		
	Is this the number of workers present during the main shift? Note that this is not a total count of workers, but rather a count of workers who are present at the same time. For example, if there are two daily eight hour shifts of 100 workers each, the Number of Workers on Main Shift value is 100. Number of Workers on Main Shift may include employees of the property, sub-contractors who are onsite regularly, and volunteers who perform regular onsite tasks. Number of Workers should not include visitors to the buildings such as clients, customers, or patients.	☐ Yes	<u> </u>
5)	Student Seating Capacity: 350		
	Is this the maximum number of students for which the school was designed? This should include the seating capacity of the entire school. If portable classrooms have been added to the school, include the capacity of these classrooms, as they expand the overall capacity of the school.	☐ Yes	☐ No
6)	Months in Use: 9		
7)	Is this the total number of months that the property is open for standard activities?	Yes	No
()	Weekend Operation: No		
	Does the property include regular activities on the weekend beyond the scope of maintenance, cleaning, and security personnel? Weekend activity could include any time when the property is used for classes, performances, or other school or community activities. The Yes selection is appropriate for any property that is open on one or both days of the weekend during one or more seasons of the year.	☐ Yes	☐ No
8)	Number of Computers: 154		
	Is this the total number of desktop computers, laptops, and data servers at the property? This number should not include tablet computers, such as iPads, or any other types of office equipment. The count should only reflect computers that are owned by the school. It should not include any computers that are brought onsite by students or staff.	Yes	□ No
9)	Cooking Facilities: 100% Yes		
	Does the property have a commercial cooking area designed to provide and serve food to occupants and/or visitors? This may include restaurants and cafeterias. If the property contains only employee break room kitchens, this field should be marked No.	🗌 Yes	🗌 No

10)	Number of Walk-in Refrigeration/Freezer Units: 0.78		
	Is this the total count of walk-in units at the property? Walk-in Refrigeration/Freezers are typically very large units located in storage areas or commercial kitchens that would not be accessible to all building occupants. This count should only include large storage units that a person actually walks into in order to store or retrieve perishable goods.	Yes [	☐ No
11)	Percent That Can Be Heated: 90		
	Is this the total percentage of the property that can be heated by mechanical equipment?	🗌 Yes	□ No
12)	Percent That Can Be Cooled: 10		
	Is this the total percentage of the property that can be cooled by mechanical equipment? This includes all types of cooling from central air to individual window units.	🗌 Yes	No
13)	School District: Dunellen School District		
13)	School District: Dunellen School District Is this the administrative school district in which the property is located?	🗌 Yes	□ No
		☐ Yes	□ No
	Is this the administrative school district in which the property is located?	Yes	□ No
	Is this the administrative school district in which the property is located?	☐ Yes	□ No
	Is this the administrative school district in which the property is located?	Yes	□ No

#### 3. Review of Energy Consumption

Data Overview			
Site Energy Use Summary		National Median Comparison	
Electric - Grid (kBtu)	1,543,479.7 (30%)	National Median Site EUI (kBtu/ft <sup>2</sup> )	74.5
Natural Gas (kBtu)	3,614,660 (70%)	National Median Source EUI (kBtu/ft²)	124.9
Total Energy (kBtu)	5,158,139.7	% Diff from National Median Source	-11.05%
Energy Intensity			
Site (kBtu/ft <sup>2</sup> )	66.3	Emissions (based on site energy use)	
Source (kBtu/ft <sup>2</sup> )	111.1	Greenhouse Gas Emissions (MtCO2e)	387.3
		<b>Power Generation Plant or Distribution</b> Public Service Electric & Gas Co	Utility:

Note: All values are annualized to a 12-month period. Source Energy includes energy used in generation and transmission to enable an equitable assessment.

#### **Summary of All Associated Meters**

The following meters are associated with the property, meaning that they are added together to get the total energy use for the property. Please see additional tables in this checklist for the exact meter consumption values.

Meter Name	Fuel Type	Start Date	End Date	Associated With
Electric Meter (Site lighting)	Electric	01/01/2012	In Use	Dunellen High School

Meter Name	Fuel Type	Start Date	End Date	Asso	ciated With	
Natural Gas Meter - 179 23 30	Natural Gas	01/01/2012	In Use	Dune	llen High School	
Electric Meter - 778 020 390	Electric	01/01/2012	In Use	Dune	llen High School	
Total Energy Use Do the meters shown reporting period of th		al energy use of this prope	erty during the	Yes	🗌 No	
Additional Fuels Do the meters above district steam, gener	ditional fuels such as	☐ Yes	🗌 No			
	<b>On-Site Solar and Wind Energy</b> Are all on-site solar and wind installations reported in this list (if present)? All on-site systems must be reported.					
Notes:						

#### Electric Meter: Electric Meter (Site lighting) (kWh (thousand Watt-hours))

Associated With: Dunellen High School						
Start Date	End Date	Usage	Green Power?			
10/31/2012	11/30/2012	334	No			
11/30/2012	01/02/2013	374	No			
01/03/2013	01/31/2013	323	No			
02/01/2013	03/04/2013	325	No			
03/05/2013	04/03/2013	274	No			
04/04/2013	05/02/2013	234	No			
05/03/2013	06/03/2013	231	No			
06/04/2013	07/02/2013	197	No			
07/03/2013	08/01/2013	211	No			
08/02/2013	08/30/2013	225	No			

Start Date	End Date	Usage	Green Power?			
08/31/2013	10/01/2013	283	No			
10/02/2013	10/30/2013	287	No			
10/31/2013	12/02/2013	357	No			
	Total Consumptio Watt-hours)):	on (kWh (thousand	3,655			
	Total Consumptio Btu)):	on (kBtu (thousand	12,470.9			
Do the fuel consumption tota	Total Energy Consumption for this Meter       Yes       No         Do the fuel consumption totals shown above include consumption of all energy tracked					
	energy calculations for the repo a utility bills received by the prop					
Notes:						

Natural Gas Meter: Natural Gas Meter - 179 23 30 (t	therms)
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Associated With: Dunellen High	School	
Start Date	End Date	Usage
10/25/2012	11/30/2012	2,026
11/30/2012	12/18/2012	6,326
12/18/2012	01/18/2013	6,691
01/18/2013	02/19/2013	6,423
02/19/2013	03/20/2013	6,346
03/20/2013	04/19/2013	4,127
04/19/2013	05/21/2013	1,713
05/21/2013	06/19/2013	227.7
06/19/2013	07/19/2013	170.6
07/19/2013	08/19/2013	150
08/19/2013	09/18/2013	175
09/18/2013	10/17/2013	253
10/17/2013	11/15/2013	3,697
	Total Consumption (therms):	38,325.3
	Total Consumption (kBtu (thousand Btu)):	3,832,530

Total Energy Consumption for this Meter Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?	☐ Yes	□ No
Notes:		

#### Electric Meter: Electric Meter - 778 020 390 (kWh (thousand Watt-hours))

sociated With: Duneller	n High School			
Start Date	End Date	Usage	Green Power?	
10/20/2012	11/19/2012	27,600	No	
11/19/2012	12/20/2012	43,400	No	
12/20/2012	01/23/2013	41,400	No	
01/23/2013	02/21/2013	41,600	No	
02/21/2013	03/22/2013	42,800	No	
03/22/2013	04/23/2013	38,000	No	
04/23/2013	05/22/2013	38,400	No	
05/22/2013	06/21/2013	41,600	No	
06/21/2013	07/23/2013	36,600	No	
07/23/2013	08/21/2013	24,000	No	
08/21/2013	09/20/2013	34,800	No	
09/20/2013	10/21/2013	35,800	No	
10/21/2013	11/19/2013	37,200	No	
	Total Consumptic Watt-hours)):	on (kWh (thousand	483,200	
	Total Consumptic Btu)):	on (kBtu (thousand	1,648,678.4	
al Energy Consumptio	on for this Meter		🗌 Yes 🗌 No	
Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?				

Notes:			

#### 4. Signature & Stamp of Verifying Licensed Professional

\_\_\_\_\_ (Name) visited this site on \_\_\_\_\_ (Date). Based on the conditions observed at the time of the visit to this property, I verify that the information contained within this application is accurate and in accordance with the Licensed Professional Guide.

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Signature:	_ Date:	
Licensed Professional		
, , ()		
<b>NOTE:</b> When applying for the ENERG	V STAR the signature of the	

Professional Engineer Stamp (if applicable)

**NOTE:** When applying for the ENERGY STAR, the signature of the Verifying Professional must match the stamp.



# **ENERGY STAR<sup>®</sup> Progress & Goals Report**



ENERGY STAR® Score<sup>1</sup>

#### **Dunellen High School**

Primary Property Function: K-12 School Gross Floor Area (ft<sup>2</sup>): 77,794 Built: 1930

For Year Ending: October 31, 2013 Date Generated: March 10, 2014 Property Address: Dunellen High School 411 First Street Dunellen, New Jersey 08812

Property ID: 3927291

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Performance Comparison

		Progress			Performance Goals	
	<b>Year Ending 10/31/2013</b> (Baseline)	Year Ending 10/31/2013 (Selected)	% Change	Property's Target	National Median	ENERGY STAR Score of 75
ENERGY STAR Score	62	62	0	50	50	75
Energy						
Site EUI (kBtu/ft <sup>2</sup> )	66.3	66.3	0	74.5	74.5	58.3
Source EUI (kBtu/ft <sup>2</sup> )	111.1	111.1	0	124.9	124.9	97.7
\$	0	0	N/A	0	0	0
\$/ft <sup>2</sup>	0	0	N/A	0	0	0
Greenhouse Gas Emissions						
MtCO2e/year	387.3	387.3	0	435.2	435.2	340.6
kgCO2e/ ft2/year	5	5	0	5.6	5.6	4.4
Water						
All Water Consumption (kgal)	N/A	N/A	N/A	*	*	*
Indoor Water Consumption (kgal)	N/A	N/A	N/A	*	*	*
Indoor Water Consumption (kgal/ft <sup>2</sup> )	N/A	N/A	N/A	*	*	*
\$	N/A	N/A	N/A	*	*	*

\*Setting and managing water targets is not yet available in Portfolio Manager.



## ENERGY STAR<sup>®</sup> Scorecard



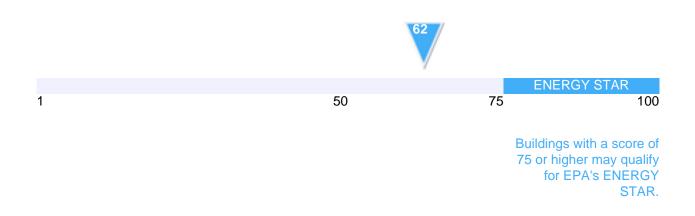
ENERGY STAR® Score

#### **Dunellen High School**

Primary Function: K-12 School Gross Floor Area (ft<sup>22</sup>): 77,794 Built: 1930

For Year Ending: October 31, 2013 Date Generated: March 10, 2014 Property Address: Dunellen High School 411 First Street Dunellen, New Jersey 08812

For the year ending in October 2013, this building used 111.1 (kBtu/ft<sup>2</sup>) on a source energy basis. The Environmental Protection Agency's (EPA's) ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.



#### **Signature of Verifying Professional**

I \_\_\_\_\_\_ (Name) verify that the information regarding energy use and property use details is true and correct to the best of my knowledge.

Signature: \_\_\_\_\_Date: \_\_\_\_\_



# **ENERGY STAR<sup>®</sup> Statement of Energy**

Performance



#### **Dunellen High School**

Primary Property Function: K-12 School Gross Floor Area (ft<sup>2</sup>): 77,794 Built: 1930



For Year Ending: October 31, 2013 Date Generated: March 10, 2014

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

#### Property & Contact Information

**Property Address Dunellen High School** 411 First Street Dunellen, New Jersey 08812 Property Owner Dunellen Public Schools High & amp; Lehigh Streets Dunellen, NJ 08812 ) -

**Primary Contact Brian Delucia** High & amp; Lehigh Streets Dunellen, NJ 08812 732 968 3226 deluciab@dunellenschools.org

#### Property ID: 3927291

Energy Consumption and Energy Use Intensity (EUI)							
Site EUI	Annual Energy by Fu	lel	National Median Comparison				
	Electric - Grid (kBtu)	1,543,480 (30%)	National Median Site EUI (kBtu/ft <sup>2</sup> )	74.5			
66.3 kBtu/ft <sup>2</sup>	Natural Gas (kBtu)	3,614,660 (70%)	National Median Source EUI (kBtu/ft²)	124.9			
	· · · · ·	, , , , ,	% Diff from National Median Source EUI	-11%			
Source EUI			Annual Emissions				
111.1 kBtu/ft <sup>2</sup>	2		Greenhouse Gas Emissions (MtCO2e/year)	387			

#### Signature & Stamp of Verifying Professional

\_\_\_\_\_ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: \_\_\_\_\_Date: \_\_\_\_\_

Licensed Professional

\_)\_\_\_--

**Professional Engineer Stamp** (if applicable)



www.dome-tech.com

510 Thornall Street, Suite 170 Edison, NJ 08837 Tel: 732.590.0122 Fax: 732.590.0129

# EQUIPMENT INVENTORY LISTS

FABER ELEMENTARY SCHOOL								
PACKAGED ROOFTOP UNITS								
Tag#	RTU	RTU	RTU	MUA				
Location	Roof	Roof	Roof	Roof				
Quantity	1	1	4	1				
Area Serving	Media Center	Computer Room	Gymnasium	Locker Rooms				
Mfg.	Carrier	Carrier	Carrier	Reznor				
Model	48HJE014531	48HJE005531	48HJE014531	HRGB350-8-SMVJ				
Serial Number	4295G30601	2995G20845	4495G30588	EAUJ66KIN78916/MV3				
Cooling Source	Packaged DX	Packaged DX	Packaged DX	None				
Cooling Capacity (tons)	12.5	4	12.5	-				
Cooling EER	9.5	11.2 EER 13 SEER	9.5	-				
Heating Source	Natural Gas	Natural Gas	Natural Gas	Natural Gas				
Heating Capacity input - MBH	250	115	250	200 (Est)				
Furnace Efficiency	80%	80%	80%	80% (Est)				
Supply Fan Motor HP	7.5 (est)	3 (Est)	7.5 (est)	2				
Motor Efcy	-	-	-	-				
Other Fan Motor HP	N/A	N/A	N/A	N/A				
Motor Efcy	-	-	-					
Flow Type	Constant Volume	Constant Volume	Constant Volume	Constant Volume				
Outside Air Economizer	No	No	100%	N/A				
Year Manufactured	1995	1995	1995	1995				
Age	19	19	19	19				
Estimated Service Life	15	15	15	15				
Remaining Life	-4	-4	-4	-4				
Notes	Fair Condition	Fair Condition	Serial Numbers	3820 CFM Total Flow				
			4495G30588, 4295G30602,	The unit does not operate				
			Fair Condition					

FABER ELEMENTARY SCHOOL							
PACKAGED ROOFTOP UNITS							
RTU	RTU						
Roof	Roof						
1	1						
Main Office	Classrooms						
Carrier	Carrier						
48AKM025-DT511HV	48HJS012-ME571HY						
4705U08553	4305G40838						
Packaged DX	Packaged DX						
25	10						
9.5	11						
Natural Gas	Natural Gas						
350	120						
81%	82%						
15	7.5						
87.50%	-						
3	5						
-	-						
VAV	Constant Volume						
100%	100%						
2005	2005						
9	9						
15	15						
6	6						
Good Condition	Good Condition						
	PACK         RTU         Roof         Roof         1         Main Office         48AKM025-DT511HV         48AKM025-DT511HV         4705U08553         Packaged DX         25         9.5         Natural Gas         350         81%         350         81%         350         81%         15         87.50%         3         2005         9         15         9         15         9         15         9         15         6	PACKAGED ROOFTOP UNITS           RTU         RTU           Roof         Roof           1         1           Main Office         Classrooms           Carrier         Carrier           48AKM025-DT511HV         48HJS012-ME571HY           4705U08553         4305G40838           Packaged DX         Packaged DX           Packaged DX         Packaged DX           9.5         10           9.5         11           Natural Gas         Natural Gas           350         120           350         120           81%         82%           350         -           350         -           350         -           15         7.5           87.50%         -           3         5           -         -           VAV         Constant Volume           100%         100%           2005         2005           9         9           15         15           6         6	PACKAGED ROOFTOP UNITSRTURTURoofRoof1111Main OfficeClassroomsCarrierCarrier48AKM025-DT511HV48HJS012-ME571HY4705U085534305G40838Packaged DXPackaged DXPackaged DXPackaged DX9.5119.511Natural GasNatural Gas35012081%82%157.587.50%VAVConstant Volume100%100%1515991515151566				

FABER ELEMENTARY SCHOOL						
	AIR HANDLING UNITS					
Tag#	Split AC	All Purpose Room HV				
Location	Board office storage	Suspended Above Stage				
Quantity	1	1				
Area Serving	Board office	All Purpose Room				
Mfg.	Carrier	Nesbitt				
Air Handler Model	40RM008-B500HC	-				
Serial Number	2095F48210	-				
Cooling Source	Split DX Condensers	None				
Condenser Make	Thermal Zone	None				
Model Number	TZAL-090C	None				
Serial Number	7753F501003485	None				
Cooling Capacity (tons)	2 x 7.5 = 15	None				
Cooling EER	10	None				
Heating Source	Hot Water	Hot Water				
Heating Capacity input - MBH	150 (Est)	-				
Fan HP	3	-				
Year Manufactured	1995	1960				
Age	19	54				
Estimated Service Life	15	15				
Remaining Life	-4	-39				
Notes						

FABER ELEMENTARY SCH	100L			
	UNIT VEN	TILATORS	WINDOW	AC UNITS
Tag#	UV	UV	AC	
Location	1960 Wing	1995 Wing	Classrooms	
Quantity	15 (Est)	12 (Est)	20 (Est)	
Area Serving	Classrooms	Classrooms	Classrooms	
Mfg.	Nesbitt	Nesbitt	Electrolux	
Model	-	-	-	
Serial Number	-	-	-	
Cooling Source	None	None	Packaged DX	
Cooling Capacity (tons)	-	-	12,000 to 18,000 BTU/hr	
Cooling EER	-	-	10 (Ave)	
Heating Source	Hot Water	Hot Water	None	
Heating Capacity input - MBH	15 (Est)	15 (Est)	-	
Fan HP	Fractional	Fractional	Fractional	
Year Manufactured	1960	1993	2000-2010	
Age	54	21	5-10 Yes	
Estimated Service Life	15	15	10	
Remaining Life	-39	-6	0 - 5	
Notes	Old in poor condition	Old in fair condition		
	Pneumatic Controls	Digital Controls		

FABER ELEMENTARY SCHOOL				
	НС	DT WATER BOILERS		
Tag#	Boilers	Boilers		
Location	North Boiler Room	South Boiler Room		
Quantity	12	7		
Area Serving	Classrooms	Classrooms		
Mfg.	HydroTherm	SlantFin Galaxy, Modular		
Model	Modular	GG-375 EC		
Serial Number	MR-1800BPV	608796		
Type of Boiler	Modular, Atmospheric	Modular, Atmospheric		
Fuel	Natural Gas	Natural Gas		
Capacity per Module, MBH	300	375		
Total Heating Capacity, Input, MBH	3600	2625		
Efficiency	80%	80%		
Year Manufactured	2005	1995		
Age	9	19		
Estimated Service Life	25	25		
Remaining Life	16	6		
Notes	Boiler is good condition	Boiler is good condition		

FABER ELEMENTARY SCHOOL				
		PUMPS		
Tag#	P1, P2	P1, P2	P1, P2	
Location	North Boiler Room	South Boiler Room	All Purpose Room	
Quantity	2	2	2	
Area Serving	North Wing Hot Water Loop	South Wing Hot Water Loop	All Purpose Room HV Unit HW Circulator	
Mfg.	Тасо	Тасо	B&G	
Model	-	-	-	
Serial Number	-	-	-	
Туре	Base mounted circulator	in-line circulator	in-line circulator	
Flow, GPM	150 (Est)	150 (Est)	20 (Est)	
Head, Ft	-	-	-	
Power, HP	3	3	3/4	
Motor Efcy	86.5%	84%	80% (Est)	
RPM	1725	1725	1725	
Year Manufactured	2005	2005	2005 (est)	
Age	9	9	9	
Estimated Service Life	10	10	20	
Remaining Life	1	1	11	
Notes	Pumps are in good condition	Pumps are in good condition	Good condition	

LocationMER Near Gym1995 Addition2005 Addition2005 AdditionQuantity11111Area ServingLocker rooms etc.BathroomsBathroomsKitchenMfg.PVIAO SmithAO SmithAO SmithModelSH05109330Serial Number200 (Est)80100300	FABER ELEMENTARY SCHOOL						
LocationMER Near Gym1995 Addition2005 Addition2005 AdditionQuantity111111Area ServingLocker rooms etc.BathroomsBathroomsKitchenMfg.PVIAO SmithAO SmithAO SmithAO SmithModelBTP300-600Serial Number0SH05109330Capacity, Gal200 (Est)80100300FuelNatural GasNatural GasNatural GasNatural GasTypeTank Type Standard EfficiencyStandard EfficiencyStandard EfficiencyHeating Capacity, MBH250 (Est)60 (Est)75600Recovery Rate, GPH68.3582Efficiency80%80%80%80%80%80%Year Manufactured19952005 (Est)2005 (Est)20052005Age-91111Hot Water CirculatorInline cartridge type circulatorInline cartridge type circul		DOMESTIC WATER HEATERS					
Quantity111Area ServingLocker rooms etc.BathroomsBathroomsKitchenMfg.LOcker rooms etc.BathroomsBathroomsKitchenMfg.PVIAO SmithAO SmithAO SmithModelBTP300-600Serial Number0SH05109330Capacity, Gal200 (Est)80100300FuelNatural GasNatural GasNatural GasNatural GasTypeTank Type Standard EfficiencyTank Type Standard EfficiencyTank Type Standard EfficiencyTank Type Standard EfficiencyHeating Capacity, MBH250 (Est)60 (Est)668.3582Efficiency80%80%80%80%Age10101010Remaining Life10101010Hot Water CirculatorInline cartridge type circulatorInline cartridge type circulatorInline cartridge type small circulator	Tag#	Water Heater	Water Heater	Water Heater	Water Heater		
Area ServingLocker nooms etc.BathroomsBathroomsBathroomsMfg.PVIAO SmithAO SmithAO SmithModelSH7300-600Serial Number0SH05109330Capacity, Gal200 (Est)80100300FuelNatural GasNatural GasNatural GasNatural GasTypeTank Type Standard EfficiencyTank Type Standard EfficiencyTank Type Standard EfficiencyTank Type Standard EfficiencyHeating Capacity, MBH250 (Est)60 (Est)75600Recovery Rate, GPH68.3582Efficiency80%80%80%80%80%Year Manufactured19952005 (Est)2005 (Est)2005Age1010101010Remaining Life-9111Hot Water CirculatorInline cartridge type circulatorNoneInline cartridge type circulator(2) inline cartridge type small circulators	Location	MER Near Gym	1995 Addition	2005 Addition	2005 Addition		
Mfg.PVIAO SmithAO SmithAO SmithModelBTP300-600Serial NumberImage: Standard EfficiencyStd05109330Std05109330Capacity, Gal200 (Est)80100300FuelNatural GasNatural GasNatural GasNatural GasTypeStandard EfficiencyTank Type Standard EfficiencyTank Type Standard EfficiencyTank Type Standard EfficiencyHeating Capacity, MBH250 (Est)60 (Est)75600Recovery Rate, GPH68.3582Efficiency80%80%80%80%Year Manufactured19952005 (Est)2005 (Est)2005Age10101010Remaining Life-9111Hot Water CirculatorInline cartridge type circulatorInline cartridge type circulatorInline cartridge type circulatorInline cartridge type circulator	Quantity	1	1	1	1		
ModelInformationInformationInformationInformationModelSH05109330Serial Number200 (Est)80100300Capacity, Gal200 (Est)80100300FuelNatural GasNatural GasNatural GasNatural GasTypeTank Type Standard EfficiencyTank Type Standard EfficiencyTank Type Standard EfficiencyTank Type Standard EfficiencyHeating Capacity, MBH250 (Est)60 (Est)75600Recovery Rate, GPH68.3582Efficiency80%80%80%80%Year Manufactured19952005 (Est)2005 (Est)2005Age10101010Remaining Life-9111Hot Water CirculatorInline cartridge type circulator(2) inline cartridge type small circulators(2) inline cartridge type small circulators	Area Serving	Locker rooms etc.	Bathrooms	Bathrooms	Kitchen		
Serial NumberImage: Construct of the series of	Mfg.	PVI	AO Smith	AO Smith	AO Smith		
Capacity, GalConcentIntercentIntercentCapacity, Gal200 (Est)80100300FuelNatural GasNatural GasNatural GasNatural GasTypeTank Type Standard EfficiencyTank Type Standard EfficiencyTank Type Standard EfficiencyTank Type Standard EfficiencyHeating Capacity, MBH250 (Est)60 (Est)75600Recovery Rate, GPH68.3582Efficiency80%80%80%80%80%Year Manufactured19952005 (Est)20052005Age1010101010Remaining Life-9111Hot Water CirculatorInline cartridge type circulatorNoneInline cartridge type circulator(2) inline cartridge type small circulator	Model	-	-	-	BTP300-600		
FuelNatural GasNatural GasNatural GasTypeTank Type Standard EfficiencyTank Type Standard EfficiencyTank Type Standard EfficiencyTank Type Standard EfficiencyHeating Capacity, MBH250 (Est)60 (Est)75600Recovery Rate, GPH68.3582Efficiency80%80%80%80%Year Manufactured19952005 (Est)20052005Age19999Estimated Service Life101010Hot Water CirculatorInline cartridge type circulatorNoneInline cartridge type circulatorInline cartridge ty	Serial Number	-	-	-	SH05109330		
TypeTank Type Standard EfficiencyTank Type Standard EfficiencyTank Type Standard EfficiencyTank Type Standard EfficiencyHeating Capacity, MBH250 (Est)60 (Est)75600Recovery Rate, GPH68.3582Efficiency80%80%80%80%80%Year Manufactured19952005 (Est)20052005Age19999Estimated Service Life-911Hot Water CirculatorInline cartridge type circulatorNoneInline cartridge type circulatorInline cartridge type circulator	Capacity, Gal	200 (Est)	80	100	300		
TypeStandard EfficiencyStandard EfficiencyStandard EfficiencyStandard EfficiencyStandard EfficiencyHeating Capacity, MBH250 (Est)60 (Est)75600Recovery Rate, GPH68.3582Efficiency80%80%80%80%Year Manufactured19952005 (Est)20052005Age19999Estimated Service Life10101010Hot Water CirculatorInline cartridge type circulatorNoneInline cartridge type circulator(2) inline cartridge type circulator	Fuel	Natural Gas	Natural Gas	Natural Gas			
Recovery Rate, GPH68.3582Efficiency80%80%80%80%80%Year Manufactured19952005 (Est)20052005Age199999Estimated Service Life10101010Hot Water CirculatorInline cartridge type circulatorNoneInline cartridge type circulatorInline cartridge type small circulatorInline cartridge type small circulatorInline cartridge type small circulator	Туре						
Efficiency80%80%80%80%Year Manufactured19952005 (Est)20052005Age199999Estimated Service Life10101010Remaining Life-9111Hot Water CirculatorInline cartridge type circulatorNoneInline cartridge type circulator(2) inline cartridge type small circulators	Heating Capacity, MBH	250 (Est)	60 (Est)	75	600		
Year Manufactured19952005 (Est)2005Age1999Estimated Service Life101010Remaining Life-911Hot Water CirculatorInline cartridge type circulatorNoneInline cartridge type circulator(2) inline cartridge type small circulators	Recovery Rate, GPH	-	-	68.3	582		
Age19999Estimated Service Life10101010Remaining Life-9111Hot Water CirculatorInline cartridge type circulatorNoneInline cartridge type circulator(2) inline cartridge type small circulators	Efficiency	80%	80%	80%	80%		
Stimated Service Life     10     10     10       Remaining Life     -9     1     1     1       Hot Water Circulator     Inline cartridge type circulator     None     Inline cartridge type circulator     (2) inline cartridge type small circulators	Year Manufactured	1995	2005 (Est)	2005	2005		
Remaining Life     -9     1     1       Hot Water Circulator     Inline cartridge type circulator     None     Inline cartridge type circulator     (2) inline cartridge type small circulators	Age	19	9	9	9		
Hot Water Circulator         Inline cartridge type circulator         None         Inline cartridge type circulator         (2) inline cartridge type small circulators	Estimated Service Life	10	10	10	10		
circulator circulator small circulators	Remaining Life	-9	1	1	1		
NotesThe unit does not runUnit is in good conditionUnit is in good conditionImage: Image: Image	Hot Water Circulator		None				
Image: second	Notes	The unit does not run	Unit is in good condition	Unit is in good condition	Unit is in good condition		
Image: series of the series							
Image: second							
Image: selection of the							
Image: selection of the							
Image: second							
Image: Constraint of the second sec							

FABER ELEMENTARY SCHOOL					
AIR COMPRESSOR					
AC #1					
1960 Wing MER					
1					
Pneumatic Thermostats					
Ingersoll Rand					
-					
-					
80 (Est)					
Duplex recip, belt driven					
2 x V2					
2					
2 x 1					
2005 (est)					
9					
20					
11					
Good condition					
	AC #1 1960 Wing MER 1960 Wing MER 1 Pneumatic Thermostats Ingersoll Rand	AC #1           1960 Wing MER           1           1           Pneumatic Thermostats           Ingersoll Rand           -           -           80 (Est)           Duplex recip, belt driven           2 x V2           2 x V2           2 x 1           2005 (est)           9           20           11	AC #1Image: Compression1960 Wing MERImage: Comparison1Image: Comparison1Image: ComparisonIngersoll RandImage: Comparison-Image: Comparison0Image: Comparison0Image: Comparison2Image: Comparison2Image: Comparison2Image: Comparison2Image: Comparison2Image: Comparison2Image: Comparison1Image: Comparison1Image: Comparison		

DUNELLEN HIGH SCHOOL				
	PACKA	AGED ROOFTOP UNITS		
Tag#	RTU	RTU	RTU-2	RTU
Location	New Roof	New Roof	New Roof	New Roof
Quantity	1	1	1	2
Area Serving	Main Office	Special Education	Auditorium Seating Area	Library
Mfg.	Trane	Lennox	Trane	Carrier
Model	YSC060 A3RHA1 ZH2000 00000 B	GCS16-513-125-5Y	YCH480 AEHR2A 7LE400 000000000000	50TJ-005311GA
Serial Number	526100039L	-	C05C02645	2499G21734
Cooling Source	Packaged DX	Packaged DX	Packaged DX	Packaged DX
Cooling Capacity (tons)	5	4	40	5
Cooling EER	10.2 SEER	10 SEER	9.5 EER	9 EER
Heating Source	Natural Gas	Natural Gas	Natural Gas	None
Heating Capacity input - MBH	130	125	800	-
Furnace Efficiency	83%	80%	81%	-
Supply Fan Motor HP	1	3/4	15	2 HP (Est)
Motor Efcy	-	-	-	-
Other Fan Motor HP	0.33	0.25	4 x 1.1 (Condenser)	1 (Condenser)
Motor Efcy	-	-	-	-
Flow Type	Constant Volume	Constant Volume	VAV wih VFD	Constant Volume
Outside Air Economizer	100%	100%	100%	No
Year Manufactured	2005	1995 (Est)	2005	1999
Age	9	19	9	15
Estimated Service Life	15	15	15	15
Remaining Life	6	-4	6	0
Notes	Good Condition	Fair condition	Good condition	Fair Condition
				This unit was enabled during survey.
				Unit was short cycling

DUNELLEN HIGH SCHOOL				
	PACK	AGED ROOFTOP UNITS		
Tag#	RTU-1			
Location	New Roof			
Quantity	1			
Area Serving	Auditorium Stage			
Mfg.	Trane			
Model Number	YCH240 B3H0JB			
Serial Number	514100981D			
Cooling Source	Packaged DX			
Cooling Capacity (tons)	20			
Cooling EER	9.5 EER			
Heating Source	Natural Gas			
Heating Capacity input - MBH	400			
Furnace Efficiency	81%			
Supply Fan Motor HP	7.5			
Motor Efcy	-			
Other Fan Motor HP	2 x 1 HP (Condenser)			
Motor Efcy	-			
Flow Type	Constant Volume			
100% Outside Air Economizer	None			
Year Manufactured	2005			
Age	9			
Estimated Service Life	15			
Remaining Life	6			
Notes	Good condition			

Tag#     Ductless Split       Location     Classroom 203       Quantity     1       Area Serving     Classroom 203       Mfg.     EMI       Air Handler Model     -       Serial Number     -       Cooling Source     Remote Condenser	IR HANDLING UNITS Ductless Split Classroom X Classroom X Classroom Classroom Classroom Rujitsu Classroom Fujitsu Remote Condenser Fujitsu AOU36CLX	Ductless Split Ceiling Cassettes Typing Rooms 2 Typing Rooms York - - Remote Condenser York	H&V Gym MER 2 Gymnasium - - - None None
LocationClassroom 203Quantity1Area ServingClassroom 203Mfg.EMIAir Handler Model-Serial Number-	Classroom X 1 Classroom Classroom Fujitsu - Classroom Fujitsu Fujitsu Classroom Fujitsu Fujitsu Fujitsu Fujitsu Fujitsu	Ceiling Cassettes Typing Rooms 2 Typing Rooms York - Remote Condenser	Gym MER 2 Gymnasium - - - None
Quantity     1       Area Serving     Classroom 203       Mfg.     EMI       Air Handler Model     -       Serial Number     -	1       Classroom       Fujitsu       -       -       Remote Condenser       Fujitsu	2 Typing Rooms York - - Remote Condenser	2 Gymnasium - - None
Area Serving     Classroom 203       Mfg.     EMI       Air Handler Model     -       Serial Number     -	Classroom Fujitsu Guide Classroom Fujitsu Guide Classroom Fujitsu Guide Condenser Fujitsu Guide Condenser Fujitsu	Typing Rooms York - - Remote Condenser	Gymnasium - - - None
Mfg. EMI Air Handler Model - Serial Number -	Fujitsu Remote Condenser Fujitsu	York - - Remote Condenser	- - None
Air Handler Model - Serial Number -	- - Remote Condenser Fujitsu	Remote Condenser	- - None
Serial Number -	Fujitsu		- None
	Fujitsu		
Cooling Source Remote Condenser	Fujitsu		
		York	None
Condenser Make EMI	AOU36CLX		
Model Number SCC36DE0000AA0A		HABA-F048SD	None
Serial Number -1-97-a-7280-5	EBN 017443	WCHP212770	None
Cooling Capacity (tons) 3	3	4	None
Cooling EER ~10 SEER	~16 SEER	~10 SEER	None
Heating Source None	None	None	Hot Water
Heating Capacity input - MBH	-	-	-
Fan HP -	-	-	-
Year Manufactured 1997	2010 (Est)	1999	1960
<b>Age</b> 17	4	15	54
Estimated Service Life 15	15	15	15
Remaining Life -2	11	0	-39
Notes Unit is old and inefficien	Good condition	Decommissioned	Fair condition
		2 cassettes connected to one condenser	

UNIT VEN	TILATORS	WINDOW	AC UNITS
UV	UV	AC	
Original Classrooms	Renovated or Expanded Classrooms	Classrooms	
20 (Est)	20 (Est)	10 (Est)	
Classrooms	Classrooms	Classrooms	
Nesbitt	Nesbitt, AAF	Electrolux	
-	Nesbitt, AAF	-	
-	-	-	
None	None	Packaged DX	
-	-	12,000 to 18,000 BTU/hr	
-	-	10 (Ave)	
Hot Water	Hot Water	None	
15 (Est)	15 (Est)	-	
Fractional	Fractional	Fractional	
1960	1985-1995	2000-2010	
54	15-25	5-10 Yes	
15	15	10	
-39	-10	0 - 5	
Old in poor condition	Old in fair condition		
Pneumatic Controls	Digital Controls		
	UVOriginal Classrooms20 (Est)ClassroomsClassroomsNesbittNoneHot Water15 (Est)Fractional19605415-39Old in poor condition	Original ClassroomsRenovated or Expanded Classrooms20 (Est)20 (Est)ClassroomsClassroomsClassroomsClassroomsNesbittNesbitt, AAF-Nesbitt, AAFNoneNoneNoneNone1.15 (Est)15 (Est)19601985-199515151515-39.10Old in poor conditionOld in fair condition	UVUVACOriginal ClassroomsRenovated or Expanded ClassroomsClassrooms20 (Est)20 (Est)10 (Est)ClassroomsClassroomsClassroomsClassroomsClassroomsClassroomsNesbittNesbitt, AAFElectrolux-Nesbitt, AAFNoneNonePackaged DX10 (Ave)Hot WaterHot WaterNone15 (Est)15 (Est)-5415-255-10 Yes151510-39-100 - 5Old in poor conditionOld in fair condition

DUNELLEN HIGH SCHOOL				
	НС	OT WATER BOILERS		
Tag#	B1 - B2			
Location	Boiler Room			
Quantity	2			
Area Serving	Hot water coils			
Mfg.	HB Smith			
Model	-			
Serial Number	HSB-03467			
Type of Boiler	Cast Iron			
Fuel	Natural Gas			
Capacity per Module, MBH	4320			
Total Heating Capacity, Input, MBH	8640			
Efficiency	70%			
Year Manufactured	1959			
Age	55			
Estimated Service Life	35			
Remaining Life	-20			
Notes	Boiler is very old but appear to be in fair condition			
	Asbestos insulation			
	Fitted with Industrial combustion burners			
	Burners are single speed with high gas modulation			
			-	
			-	
			-	
			-	

DUNELLEN HIGH SCHOOL			
	PUMPS		
P1, P2	P3, P4		
Boiler room	Boiler room		
2	2		
1960 Wing	New wing		
Armstrong	B&G		
819359	-		
400576	-		
Base mounted circulator	Base mounted circulator		
100 (Est)	100 (Est)		
-	-		
3	3		
89.5%	85.0%		
1725	1725		
-	-		
10 (Est)	10 (Est)		
20	20		
10	10		
Pumps are in fair condition	Pumps are in fair condition		
	Boiler room 2 1960 Wing Armstrong 819359 400576 Base mounted circulator 100 (Est) - 3 89.5% 1725 - 10 (Est) 20 10 20 10 Pumps are in fair	P1, P2P3, P4Boiler roomBoiler room221960 WingNew wingArmstrongB&G819359-400576-Base mounted circulatorBase mounted circulator100 (Est)100 (Est)3389.5%85.0%1725172510 (Est)10 (Est)20201010Pumps are in fairPumps are in fair	P1, P2P3, P4Boiler roomBoiler room221960 WingNew wingArmstrongB&G819359-400576-Base mounted circulatorBase mounted circulator100 (Est)100 (Est)3389.5%85.0%1725172510 (Est)10 (Est)10 (Est)10 (Est)

DUNELLEN HIGH SCHOOL											
	DOME	ESTIC WATER HEATERS									
Tag#	Water Heater	Water Heater									
Location	Boiler room	Storage Outside Kitchen									
Quantity	1	1									
Area Serving	Bathrooms	Kitchen									
Mfg.	AO Smith	-									
Model	FCG 75 300	-									
Serial Number	9200472000	-									
Capacity, Gal	70	-									
Fuel	Natural Gas	Natural Gas									
Туре	Tank Type Standard Efficiency	Tank Type Standard Efficiency									
Heating Capacity, MBH (Input)	75	-									
Recovery Rate, GPH	73	-									
Efficiency	80%	80%									
Year Manufactured	2005 (Est)	-									
Age	9	-									
Estimated Service Life	10	-									
Remaining Life	1	-									
Hot Water Circulator	Small inline cartridge	This unit was not accesible during the survey									
Notes	Unit is in good condition										

DUNELLEN HIGH SCHOOL												
		AIR COMPRESSOR										
Tag#	AC #1											
Location	Boiler Room											
Quantity	1											
Area Serving	Pneumatic Thermostats											
Mfg.	Quincy											
Model	-											
Serial Number	-											
Capacity, Gal	80 (Est)											
Туре	Duplex recip, belt driven											
Number of Compressors	2											
Number of Motors	2											
Motor HP	2 x 1											
Year Manufactured	2010 (Est)											
Age	4											
Estimated Service Life	20											
Remaining Life	16											
Notes	Good condition											

LINCOLN MIDDLE SCHOOL												
PACKA	AGED ROOFTOP UNITS											
RTU-1	RTU-2	RTU-3										
Roof	Roof	Roof										
1	1	1										
2005 expansion	Cafeterium	8 classrooms Guidance office										
Trane	Trane	Trane										
SFHFC6 0EH7D7 A89D7F 0100C0 000K00 0RT00800	YCH480 AEHR2A 7LE400 0000000000	YCH480 AEHR2A 7LE500 0000000000										
C05C02703	C05C02647	C05C02647										
Packaged DX	Packaged DX	Packaged DX										
60	40	35										
9.5 EER 12.8 IPLV	9.5 EER	9.5 EER										
Natural Gas	Natural Gas	Natural Gas										
600	800	600										
81%	81%	81%										
15	15	15										
Premium	Premium	Premium										
1 x 7.5 (Exhaust) 6 x 1 (Condenser)	2 x 1 (Exhaust) 4 x 1.1 (Condenser)	2 x 1 (Exhaust) 3 x 1.1 (Condenser)										
Premium	Premium	Premium										
VAV wih VFD	VAV wih VFD	VAV wih VFD										
100%	100%	100%										
2005	2005	2005										
9	9	9										
15	15	15										
6	6	6										
Good condition	Good condition	Good condition										
	RTU-1         Roof         1         2005 expansion         Trane         SFHFC6 0EH7D7 A89D7F         0100C0 000K00 0RT00800         C05C02703         Packaged DX         60         9.5 EER         12.8 IPLV         Natural Gas         600         81%         15         Premium         1 x 7.5 (Exhaust)         6 x 1 (Condenser)         Premium         VAV win VFD         100%         2005         9         15         6	Roof         Roof           1         1           2005 expansion         Cafeterium           Trane         Trane           SFHFC6 0EH7D7 A89D7F         YCH480 AEHR2A 7LE400           0100C0 000K00 0RT00800         0000000000           C05C02703         C05C02647           Packaged DX         Packaged DX           Packaged DX         Packaged DX           60         40           9.5 EER         9.5 EER           12.8 IPLV         9.5 EER           Natural Gas         Natural Gas           600         800           81%         81%           15         15           Premium         Premium           1 x 7.5 (Exhaust)         2 x 1 (Exhaust)           6 x 1 (Condenser)         4 x 1.1 (Condenser)           Premium         Premium           VAV wih VFD         VAV wih VFD           100%         100%           2005         2005           9         9           15         15           6         6	RTU-1         RTU-2         RTU-3           Roof         Roof         Roof         Roof           1         1         1         1           2005 expansion         Cafeterium         8 classrooms Guidance office           Trane         Trane         Trane           SFHFC6 0EH7D7 A89D7F 0100C0 000K00 0RT00800         YCH480 AEHR2A 7LE400 0000000000         YCH480 AEHR2A 7LE500 0000000000           C05C02703         C05C02647         C05C02647           Packaged DX         Packaged DX         Packaged DX           60         40         35           9.5 EER 12.8 IPLV         9.5 EER         9.5 EER           Natural Gas         Natural Gas         Natural Gas           600         800         600           81%         81%         81%           15         15         15           Premium         Premium         Premium           1 x 7.5 (Exhaust) 6 x 1 (Condenser)         2 x 1 (Exhaust) 4 x 1.1 (Condenser)         3 x 1.1 (Condenser)           9         9         9         9         9           100%         100%         100%         100%           2005         2005         2005         2005           9         9									

LINCOLN MIDDLE SCHOOL			
	Α	R HANDLING UNITS	
Tag#	AHU		
Location	2nd Floor Closet		
Quantity	1		
Area Serving	Heating and Ventilation for Bathrooms		
Mfg.	Magic Aire		
Air Handler Model	90-BVW/BVX-A		
Serial Number	951044145		
Cooling Source	None		
Condenser Make	-		
Model Number	-		
Serial Number	-		
Cooling Capacity (tons)	-		
Cooling EER	-		
Heating Source	Hot Water		
Heating Capacity input - MBH	N/A		
Fan HP	N/A		
Year Manufactured	1995		
Age	19		
Estimated Service Life	15		
Remaining Life	-4		
Notes	Unit does not operate		

LINCOLN MIDDLE SCHOOL												
	Н	OT WATER BOILERS										
Tag#												
Location	Lincoln Basement											
Quantity	5											
Area Serving	Middle School Classrooms											
Mfg.	Hydro Therm											
Model	MR-1500B-PV											
Serial Number	MSK-1733											
Type of Boiler	Modular, atmospheric burner											
Fuel	Natural Gas											
Capacity per Module, MBH	300											
Total Heating Capacity, Input, MBH	1500											
Efficiency	80%											
Year Manufactured	1996											
Age	18											
Estimated Service Life	25											
Remaining Life	7											
Notes	Good condition											
			-									
			-									
			-									
			-									

LINCOLN MIDDLE SCHOOL												
		PUMPS										
Tag#	P1, P2	P3, P4										
Location	Basement - Boiler Room	Basement - Boiler Room										
Quantity	2	2										
Area Serving	Original Building	New Section										
Mfg.	Тасо	Тасо										
Model	-	-										
Serial Number	-	-										
Туре	in-line circulator	in-line circulator										
Flow, GPM	50 (Est)	50 (Est)										
Head, Ft	-	-										
Power, HP	3	3										
Motor Efcy	-	-										
RPM	1725	1725										
Year Manufactured	2005	2005										
Age	9	9										
Estimated Service Life	10	10										
Remaining Life	1	1										
Notes	Pumps are in good condition	Pumps are in good condition										

LINCOLN MIDDLE SCHOOL	-			
	DOME	STIC WATER HEATERS	i	
Tag#	WH-1, 2	WH-3		
Location	Basement	2nd Floor		
Quantity	2	1		
Area Serving	Faucets in the bathrooms and classroomss	Faucets in the bathrooms and classroomss		
Mfg.	AO Smith	AO Smith		
Model	BTR 120-110	-		
Serial Number	9280725002	9280725002		
Capacity, Gal	71	71		
Fuel	Natural Gas	Electric		
Туре	Tank Type Standard Efficiency	Tank Type		
Heating Capacity, MBH (Input)	120	N/A		
Recovery Rate, GPH	116.36	N/A		
Efficiency	80%	100%		
Year Manufactured	2004	N/A		
Age	10	N/A		
Estimated Service Life	10	10		
Remaining Life	0	N/A		
Hot Water Circulator	Inline cartridge type circulator	None		
Notes	Units are in good condition	Good condition		



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# **ECM** LIST

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ECM #1:

### **COMPUTER POWER MANAGEMENT**

#### Network Computer Power Management System

School	Number of LaptopsNumber of Computers with Flat PanelNumber of Computers with CRTNumber of Computers with ComputersElectr Computers		<b>u</b> .	Cost of Electricity \$/kWh	Savings, \$	Cost, \$		
Faber Elementary School		72	39	111	20,664	\$0.158	\$3,260	\$3,330
Lincoln Middle School	26			26	1,354	\$0.167	\$226	\$780
Roosevelt High School	104	50		154	13,396	\$0.155	\$2,081	\$4,620
Total	130	122	39	291	35,414		\$5,568	\$8,730

	Power	Used	Not use	ed	Energy Savings
	(Watt)	Hrs <sup>1</sup>	Hrs Awake <sup>2</sup>	Hrs Off <sup>3</sup>	kWh/Yr
Average Power Laptop	31	840	3360	4560	104
Average Power Desktop (Panel)	95	840	3360	4560	319
Average Power Desktop (CRT)	140	840	3360	4560	470
Diversity Factor	50%				

(1): Computers in session

(35weeks/yr, 4 days/week, 6 hrs/day)

(2): Computers ON but not used(3): Computers shut off

(35weeks/yr, 5 days/week, 24/hr/day except computer hours in session) Any other time (Weekends, winter/summer breaks)

Cost of software

\$30 / Unit

Computer power requirements estimated based on ASHRAE Fundamentals 2013, Section 18, Table 8





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ECM #2:

## **CRT MONITOR REPLACEMENT**

#### **CRT Monitor Replacement**

School	Computers with Savings kW Savings, Ele		Cost of Electricity \$/kWh	Savings, \$	Cost, \$	
Faber Elementary School	37	1.1	4,662	\$0.158	\$736	\$4,440
Lincoln Middle School	0	0.0	0	\$0.167	\$0	\$0
High School	0	0.0	0	\$0.155	\$0	\$0
Total	37	1.1	4,662	-	\$736	\$4,440

	Power	Used	Not used		Energy Savings
	(Watt)	Hrs <sup>1</sup>	Hrs Awake <sup>2</sup>	Hrs Off <sup>3</sup>	kWh/Yr
Average Power LED Panel	18	840	3360	4560	60
Average Power CRT	75	840	3360	4560	252
Diversity Factor	50%				

(35weeks/yr, 5 days/week, 24/hr/day except computer hours in session)

(1): Computers in session

(3): Computers OFF

(35weeks/yr, 4 days/week, 6 hrs/day)

(2): Computers ON monitor OFF

Any other time (Weekends, winter/summer breaks)

Cost of 19" Monitor

Monitor power requirements estimated based on ASHRAE Fundamentals 2013, Section 18, Table 8

\$120 / Unit



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ECM #3:

### LIGHTING EQUIPMENT UPGRADE



## LIGHTING RETROFIT SUMMARY FOR: John P. Faber School High&Lehigh Streets, Dunellen, NJ 08812

BUILDIN	NG INFORM	ATION		EXISTING	G FIXTURE	S	P	ROPOS		ES		SAVINGS							FINANCIAL					
BUIL	ILDING	SQ. FT.	PRE TOTAL FIXT. QTY	PRE TOTAL FIXT. WATTS	PRE ANNUAL KWH CONSUMPTION	PRE WATTS / SQ. FT	POST TOTAL FIXT. QTY	POST TOTAL FIXT. WATTS	POST ANNUAL KWH CONSUMPTION	POST WATTS / SQ. FT	WATTS SAVED	ANNUAL KWH SAVED WITH FIXTURES	ANNUAL KWH SAVED WITH SENSORS	TOTAL ANNUAL KWH SAVED	ANNUAL SAVINGS \$ FIXT.	ANNUAL SAVINGS \$ SENSORS	ANNUAL SAVINGS \$ TOTAL	CO2 REDUCTION (TONS)	FIATURE	NJ Smart Start SENSOR REBATE \$	FIXTURES TOTAL (INSTALLED) COST \$	SENSORS TOTAL (INSTALLED) COST \$	MATERIAL TOTAL (INSTALLED) COST \$	SIMPLE PAYBACK AFTER REBATE (YEARS)
John P. Fa	aber School	89,203	996	107,390	254,685	1.20	996	74,062	176,534	0.83	33,328	78,151	19,218	97,369	\$12,330	\$3,032	\$15,362	25.8	\$13,880	\$4,315	\$70,570	\$28,570	\$99,140	5.3

4%	PERCENTAGE OF REBATES IN TOTAL INSTALLED COST
69%	PERCENTAGE OF CONSUMPTION COMPARE TO EXISTING STATE
42%	EXISTING PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING
29%	PROPOSED PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING

Dom	e-Tech, Inc.		LIGHTING UPGRADE PROJECT LINE x LINE DETAIL		ISTOM CILITY				Dunellen Public Schools John P. Faber School			FAC	CILITY S 89,203				TE OF AU 12/12/20 <sup>-</sup>	-	]					
	SPACE	DESCRIPTION	EXISTING	FIXTU	RES					REF	PLACE	MENT F	IXTURES	6							ENERG	Y ANAL	YSIS	
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS 910	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS 910	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS) \$0.158
1	2	3		5	6	7	8	9		12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1	First Floor	Classroom 41	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Surface Mount, Prismatic Lens	16	68	1,091	2,200	2,401	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	16	49	300	Ceiling	1	784	1,900	1,725	1,490	19	307	300	676	235	\$144
2	First Floor	Classroom 42	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Surface Mount, Prismatic Lens	18	68	1,228	2,200	2,701	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	18	49	300	Ceiling	1	882	1,900	1,940	1,676	19	346	300	760	265	\$162
3	First Floor	Bathroom	2'x4' Surface Fixture, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	62	62	2,200	136	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	1	48	300	Ceiling	1	48	1,900	106	91	14	14	300	31	14	\$7
4	First Floor	Classroom 40	1'x4' Surface Mount, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	12	144	1,728	2,200	3,802	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	12	98	300	Ceiling	1	1,176	1,900	2,587	2,234	46	552	300	1,214	353	\$247
5	First Floor	All Purpose Room	400W Metal Halide Fixtures (Pandant)	16	460	7,360	2,200	16,192	4 Lamp F54T5HO/ (54W) High Bay Fixture with Wireguard	16	236	0	Ceiling	3	3,776	2,200	8,307	8,307	224	3,584	0	7,885	0	\$1,244
6	First Floor	All Purpose Room - Stage	300W Pandand Incandescent Fixtures	4	300	1,200	2,200	2,640	New 100W LED Fixture	4	100	0	Ceiling	2	400	2,200	880	880	200	800	0	1,760	0	\$278
7	First Floor	Kitchen	2'x4' Surface Fixture, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	10	62	620	2,200	1,364	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	10	48	0	Ceiling	0	480	2,200	1,056	1,056	14	140	0	308	0	\$49
8	First Floor	Kitchen Hood	60W incandescent	5	60	300	500	150	18W CFL	5	18	0	Ceiling	0	90	500	45	45	42	210	0	105	0	\$17
9	First Floor	Food Storage Room 1	2'x4' Surface Fixture, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	62	186	500	93	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	3	48	0	Ceiling	0	144	500	72	72	14	42	0	21	0	\$3
10	First Floor	Food Storage Room 2	2'x4' Surface Fixture, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	62	124	500	62	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	2	48	0	Ceiling	0	96	500	48	48	14	28	0	14	0	\$2
11	First Floor	Kitchen Office	2'x4' Surface Fixture, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	62	124	2,200	273	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	2	48	300	Wall	1	96	1,900	211	182	14	28	300	62	29	\$14
12	First Floor	Bathroom	1'x4' Pandant Fixture, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	62	124	2,200	273	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	2	49	300	Ceiling	1	98	1,900	216	186	13	26	300	57	29	\$14
13	First Floor	Bathroom	2'x4' Surface Fixture, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	62	62	2,200	136	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	1	48	300	Ceiling	1	48	1,900	106	91	14	14	300	31	14	\$7
14	First Floor	Back hallway	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	62	248	5,000	1,240	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	4	48	0	Ceiling	0	192	5,000	960	960	14	56	0	280	0	\$44
15	First Floor	Diswashing Room	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	62	124	2,200	273	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	2	48	300	Ceiling	1	96	1,900	211	182	14	28	300	62	29	\$14
16	First Floor	Storage Room	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	62	124	500	62	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	2	48	0	Ceiling	0	96	500	48	48	14	28	0	14	0	\$2
17	First Floor	Classroom 1	1'x4' Surface Fixture, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	9	62	558	2,200	1,228	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	9	49	300	Ceiling	1	441	1,900	970	838	13	117	300	257	132	\$61
18	First Floor	Girls Bathroom	1'x4' Surface Fixture, Prismatic Lens, w/ (2) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	2	66	132	2,200	290	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	2	49	300	Ceiling	1	98	1,900	216	186	17	34	300	75	29	\$16
19	First Floor	Storage Room	1'x4' Surface Mount, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	1	144	144	2,200	317	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	1	98	0	Ceiling	0	98	2,200	216	216	46	46	0	101	0	\$16
20	First Floor	Boys Bathroom	1'x4' Surface Fixture, Prismatic Lens, w/ (2) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	2	66	132	2,200	290	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	2	49	300	Ceiling	1	98	1,900	216	186	17	34	300	75	29	\$16
21	First Floor	Classroom 2	1'x4' Surface Mount, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	4	144	576	2,200	1,267	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	4	98	300	Ceiling	1	392	1,900	862	745	46	184	300	405	118	\$82
22	First Floor	Classroom 3A	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	5	62	310	2,200	682	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	5	48	300	Ceiling	1	240	1,900	528	456	14	70	300	154	72	\$36
23	First Floor	Main Office Vestibule	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	62	124	5,000	620	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	2	48	0	Ceiling	0	96	5,000	480	480	14	28	0	140	0	\$22
24	First Floor	Classroom 28	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	86	517	2,200	1,138	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	6	72	300	Ceiling	1	432	1,900	950	821	14	85	300	187	130	\$50
25	First Floor	Classroom 29	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	86	517	2,200	1,138	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	6	72	300	Ceiling	1	432	1,900	950	821	14	85	300	187	130	\$50
26	First Floor	Classroom 30	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	12	86	1,032	2,200	2,270	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	12	72	300	Ceiling	1	864	1,900	1,901	1,642	14	168	300	370	259	\$99
27	First Floor	Closet	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Surface Mount, Prismatic Lens	1	68	68	500	34	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	1	49	0	Ceiling	0	49	500	25	25	19	19	0	10	0	\$2
28	First Floor	Storage Near 30	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Surface Mount, Prismatic Lens	2	68	136	500	68	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	2	49	0	Ceiling	0	98	500	49	49	19	38	0	19	0	\$3
29	First Floor	WorkRoom	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	344	2,200	757	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	4	72	300	Ceiling	1	288	1,900	634	547	14	56	300	123	86	\$33
30	First Floor	Storage	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Surface Mount, Prismatic Lens	1	68	68	500	34	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	1	49	0	Ceiling	0	49	500	25	25	19	19	0	10	0	\$2
31	First Floor	Classroom 31	1'x4' Surface Mount, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	12	144	1,728	2,200	3,802	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	12	98	300	Ceiling	1	1,176	1,900	2,587	2,234	46	552	300	1,214	353	\$247
32	First Floor	Classroom 32	1'x4' Surface Mount, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	12	144	1,728	2,200	3,802	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	12	98	300	Ceiling	1	1,176	1,900	2,587	2,234	46	552	300	1,214	353	\$247
33	First Floor	Classroom 33	1'x4' Surface Mount, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	20	144	2,880	2,200	6,336	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	20	98	300	Ceiling	1	1,960	1,900	4,312	3,724	46	920	300	2,024	588	\$412
34	First Floor	Classroom 34	1'x4' Surface Mount, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	16	144	2,304	2,200	5,069	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	16	98	300	Ceiling	1	1,568	1,900	3,450	2,979	46	736	300	1,619	470	\$330

COS		S
TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES 29
27 \$200	28 \$250	
\$800	\$250	\$855
\$900	\$250	\$935
\$50	\$250	\$255
\$720	\$250	\$815
\$6,400	\$750	\$5,235
\$1,600	\$500	\$1,560
\$500	\$0	\$400
\$25	\$0	\$25
\$150	\$0	\$120
\$100	\$0	\$80
\$100	\$120	\$180
\$100	\$250	\$295
\$50	\$250	\$255
\$200	\$0	\$160
\$100	\$250	\$295
\$100	\$0	\$80
\$450	\$250	\$575
\$100	\$250	\$295
\$60	\$0	\$50
\$100	\$250	\$295
\$240	\$250	\$415
\$250	\$250	\$415
\$100	\$0	\$80
\$330	\$250	\$485
\$330	\$250	\$485
\$660	\$250	\$755
\$50	\$0	\$40
\$100	\$0	\$80
\$220	\$250	\$395
\$50	\$0	\$40
\$720	\$250	\$815
\$720	\$250	\$815
\$1,200	\$250	\$1,215
\$960	\$250	\$1,015

Dor	Pare-Tech, Inc.		LIGHTING UPGRADE PROJECT LINE x LINE DETAIL		JSTON CILITY				Dunellen Public Schools John P. Faber School			FA	CILITY S 89,203	Q. FT.			ΓΕ ΟF Αι 12/12/20 <sup>7</sup>										
	SPACE	DESCRIPTION	EXISTING	FIXTU	IRES					REP	LACE	MENT F	IXTURES								ENERC	GY ANAL	YSIS		COS	T ANALYSI	S
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	default annual hours 910	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS 910	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	total annual \$ savings / line (including sensors) \$0.158	TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
35	First Floor	Boiler Room	60W incandescent	3	60	180	2,200	396	18W CFL	3	18	0	Ceiling	0	54	2,200	119	119	42	126	0	277	0	\$44	\$15	\$0	\$15
36	First Floor	Boys Bathroom	60W incandescent	1	60	60	2,200	132	18W CFL	1	18	300	Ceiling	1	18	1,900	40	34	42	42	300	92	5	\$15	\$5	\$250	\$220
37	First Floor	Boys Bathroom	1'x4' Surface Mount, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	2	144	288	2,200	634	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	2	98	300	Ceiling	1	196	1,900	431	372	46	92	300	202	59	\$41	\$120	\$250	\$315
38	First Floor	Custodian Room	1'x4' Surface Mount, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	1	144	144	500	72	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	1	98	0	Ceiling	0	98	500	49	49	46	46	0	23	0	\$4	\$60	\$0	\$50
39	First Floor	Maintanence Room	1'x4' Surface Mount, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	3	144	432	500	216	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	3	98	0	Ceiling	0	294	500	147	147	46	138	0	69	0	\$11	\$180	\$0	\$150
40	First Floor	Classroom 35	1'x4' Surface Mount, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	12	144	1,728	2,200	3,802	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	12	98	300	Ceiling	1	1,176	1,900	2,587	2,234	46	552	300	1,214	353	\$247	\$720	\$250	\$815
41	First Floor	Classroom 36	1'x4' Surface Mount, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	12	144	1,728	2,200	3,802	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	12	98	300	Ceiling	1	1,176	1,900	2,587	2,234	46	552	300	1,214	353	\$247	\$720	\$250	\$815
42	First Floor	Classroom 37	1'x4' Surface Mount, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	12	144	1,728	2,200	3,802	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	12	98	300	Ceiling	1	1,176	1,900	2,587	2,234	46	552	300	1,214	353	\$247	\$720	\$250	\$815
43	First Floor	Classroom 38	1'x4' Surface Mount, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	12	144	1,728	2,200	3,802	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	12	98	300	Ceiling	1	1,176	1,900	2,587	2,234	46	552	300	1,214	353	\$247	\$720	\$250	\$815
44	First Floor	Classroom 39	1'x4' Surface Mount, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	12	144	1,728	2,200	3,802	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	12	98	300	Ceiling	1	1,176	1,900	2,587	2,234	46	552	300	1,214	353	\$247	\$720	\$250	\$815
45	First Floor	Girls Locker Room A	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Surface Mount, Prismatic Lens	6	68	409	2,200	900	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	6	49	300	Ceiling	1	294	1,900	647	559	19	115	300	253	88	\$54	\$300	\$250	\$455
46	First Floor	Gilrs Locker Room B	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Surface Mount, Prismatic Lens	4	68	273	2,200	600	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	4	49	300	Ceiling	1	196	1,900	431	372	19	77	300	169	59	\$36	\$200	\$250	\$375
47	First Floor	Gym Hallway	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	5,000	862	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	2	72	0	Ceiling	0	144	5,000	720	720	14	28	0	142	0	\$22	\$110	\$0	\$90
48	First Floor	Electrical Closet	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pandant, Prismatic Lens	3	68	205	500	102	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	3	49	0	Ceiling	0	147	500	74	74	19	58	0	29	0	\$5	\$150	\$0	\$120
49	First Floor	Electrical Closet	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pandant, Prismatic Lens	3	68	205	500	102	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	3	49	0	Ceiling	0	147	500	74	74	19	58	0	29	0	\$5	\$150	\$0	\$120
50	First Floor	South East (SE) Entrance	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	5,000	431	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	1	72	0	Ceiling	0	72	5,000	360	360	14	14	0	71	0	\$11	\$55	\$0	\$45
51	First Floor	Classroom 9	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	14	86	1,207	2,200	2,655	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	14	72	300	Ceiling	1	1,008	1,900	2,218	1,915	14	199	300	437	302	\$117	\$770	\$250	\$845
52	First Floor	Classroom 9- Kitchen	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,200	378	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	2	72	300	Ceiling	1	144	1,900	317	274	14	28	300	62	43	\$17	\$110	\$250	\$305
53	First Floor	Classroom 10	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	14	86	1,207	2,200	2,655	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	14	72	300	Ceiling	1	1,008	1,900	2,218	1,915	14	199	300	437	302	\$117	\$770	\$250	\$845
54	First Floor	Custodian Room	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Surface Mount, Prismatic Lens	2	68	136	500	68	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	2	49	0	Ceiling	0	98	500	49	49	19	38	0	19	0	\$3	\$100	\$0	\$80
55	First Floor	Storage Room	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	500	43	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	1	72	0	Ceiling	0	72	500	36	36	14	14	0	7	0	\$1	\$55	\$0	\$45
56	First Floor	Boys Bathroom	2'x4' Recessed Troffer w/ Clear Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	2,200	189	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	1	72	300	Ceiling	1	72	1,900	158	137	14	14	300	31	22	\$8	\$55	\$250	\$260
57	First Floor	Boys Bathroom	Recessed can fixture w/ no lens w/ (2) 18W Compact Fluorescent Lamp (CFL)	2	36	72	2,200	158	None	2	36	300	Ceiling	1	72	1,900	158	137	0	0	300	0	22	\$3	\$0	\$250	\$215
58	First Floor	Girls Bathroom	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	2,200	189	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	1	72	300	Ceiling	1	72	1,900	158	137	14	14	300	31	22	\$8	\$55	\$250	\$260
59	First Floor	Classroom 12	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	14	86	1,207	2,200	2,655	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	14	72	300	Ceiling	1	1,008	1,900	2,218	1,915	14	199	300	437	302	\$117	\$770	\$250	\$845
60	First Floor	Classroom 14	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	14	86	1,207	2,200	2,655	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	14	72	300	Ceiling	1	1,008	1,900	2,218	1,915	14	199	300	437	302	\$117	\$770	\$250	\$845
61	First Floor	Classroom 11	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	86	516	2,200	1,135	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	6	72	300	Ceiling	1	432	1,900	950	821	14	84	300	185	130	\$50	\$330	\$250	\$485
62	First Floor	Classroom 12 Kitchen	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,200	378	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	2	72	300	Ceiling	1	144	1,900	317	274	14	28	300	62	43	\$17	\$110	\$250	\$305
63	First Floor	Classroom 13	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	86	516	2,200	1,135	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	6	72	300	Ceiling	1	432	1,900	950	821	14	84	300	185	130	\$50	\$330	\$250	\$485
64	First Floor	Classroom 15	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	9	86	774	2,200	1,703	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	9	72	300	Ceiling	1	648	1,900	1,426	1,231	14	126	300	277	194	\$74	\$495	\$250	\$620
65	First Floor	Kindergarden Room 16	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	12	86	1,032	2,200	2,270	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	12	72	300	Ceiling	1	864	1,900	1,901	1,642	14	168	300	370	259	\$99	\$660	\$250	\$755
66	First Floor	Closet	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	500	43	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	1	72	0	Ceiling	0	72	500	36	36	14	14	0	7	0	\$1	\$55	\$0	\$45
67	First Floor	Classroom 17	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	10	86	860	2,200	1,892	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	10	72	300	Ceiling	1	720	1,900	1,584	1,368	14	140	300	308	216	\$83	\$550	\$250	\$665
68	First Floor	Closet	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	500	43	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	1	72	0	Ceiling	0	72	500	36	36	14	14	0	7	0	\$1	\$55	\$0	\$45

Dor	Pare-Tech, Inc.		LIGHTING UPGRADE PROJECT LINE x LINE DETAIL		ISTOM CILITY				Dunellen Public Schools John P. Faber School			FA	CILITY S 89,203				TE OF AU 12/12/20 <sup>-</sup>	-						
	SPACE	DESCRIPTION	EXISTING	FIXTU	RES			-		REF	PLACE	MENT F	IXTURES	6							ENERG	Y ANAL	YSIS	
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT.	PRE WATTS	PRE TOTAL WATTS	DEFAULT ANNUAL HOURS	PRE ANNUAL	PROPOSED FIXTURE DESCRIPTION	POST FIXT.	POST WATTS	ANNUAL HOURS	SENSOR	QTY SENSORS	POST TOTAL WATTS	ANNUAL HOURS	POST	POST ANNUAL KWH	WATTS SAVED	TOTAL WATTS SAVED	ANNUAL HOURS	ANNUAL KWH SAVED	ANNUAL KWH SAVED	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING
LIVE	FLOOR	SPACE DESCRIPTION		QTY	/ FIXT.	/ LINE	910	KWH	PROFUSED PRIVICE DESCRIPTION	QTY	/ FIXT.	SAVED	TYPE	/ LINE	/ LINE	910	KWH	WITH OCC SENSOR	/ FIXT.	/ LINE	SAVED	FROM FIXT.	WITH	sensors) \$0.158
69	First Floor	Classroom 18	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	10	86	860	2,200	1,892	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	10	72	300	Ceiling	1	720	1,900	1,584	1,368	14	140	300	308	216	\$83
70	First Floor	Classroom 19	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	12	86	1,032	2,200	2,270	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	12	72	300	Ceiling	1	864	1,900	1,901	1,642	14	168	300	370	259	\$99
71	First Floor	Classroom 20	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	11	86	946	2,200	2,081	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	11	72	300	Ceiling	1	792	1,900	1,742	1,505	14	154	300	339	238	\$91
72	First Floor	Classroom 21	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	11	86	946	2,200	2,081	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	11	72	300	Ceiling	1	792	1,900	1,742	1,505	14	154	300	339	238	\$91
73	First Floor	Classroom 22	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	11	86	946	2,200	2,081	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	11	72	300	Ceiling	1	792	1,900	1,742	1,505	14	154	300	339	238	\$91
74	First Floor	Boys Room	2'x4' Recessed Troffer w/ Clear Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	2,200	189	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	1	72	300	Ceiling	1	72	1,900	158	137	14	14	300	31	22	\$8
75	First Floor	Girls Room	2'x4' Recessed Troffer w/ Clear Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	2,200	189	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	1	72	300	Ceiling	1	72	1,900	158	137	14	14	300	31	22	\$8
76	First Floor	Elevator Closet	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Surface Mount, Prismatic Lens	1	68	68	500	34	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	1	49	0	Ceiling	0	49	500	25	25	19	19	0	10	0	\$2
77	First Floor	Computer Room	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	15	86	1,290	2,200	2,838	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	15	72	300	Ceiling	1	1,080	1,900	2,376	2,052	14	210	300	462	324	\$124
78	First Floor	Classroom 24	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	8	86	688	2,200	1,514	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	8	72	300	Ceiling	1	576	1,900	1,267	1,094	14	112	300	246	173	\$66
79	First Floor	Classroom 26	2'x4' Recessed Troffer, No Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	107	427	2,200	939	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	4	98	300	Ceiling	1	392	1,900	862	745	9	35	300	77	118	\$31
80	First Floor	Classroom 27	2'x4' Recessed Troffer, No Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	107	427	2,200	939	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	4	98	300	Ceiling	1	392	1,900	862	745	9	35	300	77	118	\$31
81	First Floor	Media Center	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	14	86	1,204	2,200	2,649	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	14	72	300	Ceiling	1	1,008	1,900	2,218	1,915	14	196	300	431	302	\$116
82	First Floor	Media Center	Recessed Round Fixtures with 150 W Metal Halide Lamps	35	185	6,475	2,200	14,245	45 Watt LED Fixtures	35	45	300	Ceiling	1	1,575	1,900	3,465	2,993	140	4,900	300	10,780	473	\$1,775
83	First Floor	Media Center	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	86	516	2,200	1,135	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	6	72	300	Ceiling	1	432	1,900	950	821	14	84	300	185	130	\$50
84	First Floor	Circulation Desk	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	86	516	2,200	1,135	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	6	72	300	Ceiling	1	432	1,900	950	821	14	84	300	185	130	\$50
85	First Floor	Mechanical Storage Room	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	5	86	430	500	215	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	5	72	0	Ceiling	0	360	500	180	180	14	70	0	35	0	\$6
86	First Floor	GYM A	400W Metal Halide Fixtures (Pandant)	15	460	6,900	2,500	17,250	4 Lamp F54T5HO/ (54W) High Bay Fixture with Wireguard	15	236	300	Ceiling	1	3,540	2,200	8,850	7,788	224	3,360	300	8,400	1,062	\$1,493
87	First Floor	GYM B	400W Metal Halide Fixtures (Pandant)	15	460	6,900	2,500	17,250	4 Lamp F54T5HO/ (54W) High Bay Fixture with Wireguard	15	236	300	Ceiling	1	3,540	2,200	8,850	7,788	224	3,360	300	8,400	1,062	\$1,493
88	First Floor	Gym Officce	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	86	259	2,200	569	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	3	72	300	Wall	1	216	1,900	475	410	14	43	300	94	65	\$25
89	First Floor	Boys Locker Room A	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Surface Mount, Prismatic Lens	6	68	409	2,200	900	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	6	49	300	Ceiling	1	294	1,900	647	559	19	115	300	253	88	\$54
90	First Floor	Boys Locker Room B	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Surface Mount, Prismatic Lens	4	68	273	2,200	600	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	4	49	300	Ceiling	1	196	1,900	431	372	19	77	300	169	59	\$36
91	First Floor	Trainers Office	1'x4' Surface Fixture, Prismatic Lens, w/ (3) F32T8 700 Lamps & (1) Electronic Ballast	2	86	172	2,200	378	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	2	72	300	Wall	1	144	1,900	317	274	14	28	300	62	43	\$17
92	Second Floor	Storage Room	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pandant, Prismatic Lens	4	68	273	500	136	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	4	49	0	Ceiling	0	196	500	98	98	19	77	0	38	0	\$6
93	Second Floor	Classroom 207	2'x4' Recessed Troffer w/ Clear Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	11	86	946	2,200	2,081	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	11	72	300	Ceiling	1	792	1,900	1,742	1,505	14	154	300	339	238	\$91
94	Second Floor	Classroom 207	2'x2' Recessed Troffer, No Lens, w/ (2) FBO31T8/835, 32w 800 U- Lamps & (1) Electronic Ballast	1	64	64	2,200	140	None	1	64	300	Ceiling	1	64	1,900	140	121	0	0	300	0	19	\$3
95	Second Floor	Classroom 210	2'x4' Recessed Troffer w/ Clear Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	11	86	946	2,200	2,081	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	11	72	300	Ceiling	1	792	1,900	1,742	1,505	14	154	300	339	238	\$91
96	Second Floor	Classroom 210	2'x2' Recessed Troffer, No Lens, w/ (2) FBO31T8/835, 32w 800 U- Lamps & (1) Electronic Ballast	1	64	64	2,200	140	None	1	64	300	Ceiling	1	64	1,900	140	121	0	0	300	0	19	\$3
97	Second Floor	Storage Room	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pandant, Prismatic Lens	4	68	273	500	136	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	4	49	0	Ceiling	0	196	500	98	98	19	77	0	38	0	\$6
98	Second Floor	Boys Room	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	2,200	189	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	1	72	300	Ceiling	1	72	1,900	158	137	14	14	300	31	22	\$8
99	Second Floor	Boys Room	Recessed can fixture w/ no lens w/ (2) 18W Compact Fluorescent Lamp (CFL)	2	36	72	2,200	158	None	2	36	300	Ceiling	1	72	1,900	158	137	0	0	300	0	22	\$3
100	Second Floor	Custodian Room	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Surface Mount, Prismatic Lens	1	68	68	500	34	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	1	49	300	Ceiling	1	49	200	25	10	19	19	300	10	15	\$4
101	Second Floor	Girls Room	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	2,200	189	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	1	72	300	Ceiling	1	72	1,900	158	137	14	14	300	31	22	\$8
102	Second Floor	Girls Room	Recessed can fixture w/ no lens w/ (2) 18W Compact Fluorescent Lamp (CFL)	2	36	72	2,200	158	None	2	36	300	Ceiling	1	72	1,900	158	137	0	0	300	0	22	\$3

COS		IS
TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
\$550	\$250	\$665
\$660	\$250	\$755
\$605	\$250	\$710
\$605	\$250	\$710
\$605	\$250	\$710
\$55	\$250	\$260
\$55	\$250	\$260
\$50	\$0	\$40
\$825	\$250	\$890
\$440	\$250	\$575
\$240	\$250	\$415
\$240	\$250	\$415
\$770	\$250	\$845
\$3,500	\$250	\$3,365
\$330	\$250	\$485
\$330	\$250	\$485
\$275	\$0	\$225
\$6,000	\$250	\$4,715
\$6,000	\$250	\$4,715
\$165	\$120	\$235
\$300	\$250	\$455
\$200	\$250	\$375
\$110	\$120	\$190
\$200	\$0	\$160
\$605	\$250	\$710
\$0	\$250	\$215
\$605	\$250	\$710
\$0	\$250	\$215
\$200	\$0	\$160
\$55	\$250	\$260
\$0	\$250	\$215
\$50	\$250	\$255
\$55	\$250	\$260
\$0	\$250	\$215

Do	Pare-Tech, Inc.		LIGHTING UPGRADE PROJECT LINE x LINE DETAIL		ISTOM CILITY				Dunellen Public Schools John P. Faber School			FAC	ILITY S 89,203	-			TE OF AU 12/12/20 <sup>2</sup>	-	]					
	SPACE I	DESCRIPTION	EXISTING	FIXTU	RES					REF	PLACE	MENT FI	XTURES	5							ENERG	Y ANAL	YSIS	
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS 910	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS 910	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS) \$0.158
103	Second Floor	Classroom 208	2'x4' Recessed Troffer w/ Clear Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	11	86	946	2,200	2,081	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	11	72	300	Ceiling	1	792	1,900	1,742	1,505	14	154	300	339	238	\$91
104	Second Floor	Classroom 208	2'x2' Recessed Troffer, No Lens, w/ (2) FBO31T8/835, 32w 800 U- Lamps & (1) Electronic Ballast	1	64	64	2,200	140	None	1	64	300	Ceiling	1	64	1,900	140	121	0	0	300	0	19	\$3
105	Second Floor	Classroom 206	2'x4' Recessed Troffer w/ Clear Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	11	86	946	2,200	2,081	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	11	72	300	Ceiling	1	792	1,900	1,742	1,505	14	154	300	339	238	\$91
106	Second Floor	Classroom 206	2'x2' Recessed Troffer, No Lens, w/ (2) FBO31T8/835, 32w 800 U- Lamps & (1) Electronic Ballast	1	64	64	2,200	140	None	1	64	300	Ceiling	1	64	1,900	140	121	0	0	300	0	19	\$3
107	Second Floor	Hallway	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	11	86	948	5,000	4,741	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	11	72	0	Ceiling	0	792	5,000	3,960	3,960	14	156	0	781	0	\$123
108	Second Floor	Classroom 203	2'x4' Recessed Troffer w/ Clear Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	11	86	946	2,200	2,081	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	11	72	300	Ceiling	1	792	1,900	1,742	1,505	14	154	300	339	238	\$91
109	Second Floor	Classroom 203	2'x2' Recessed Troffer, No Lens, w/ (2) FBO31T8/835, 32w 800 U- Lamps & (1) Electronic Ballast	1	64	64	2,200	140	None	1	64	300	Ceiling	1	64	1,900	140	121	0	0	300	0	19	\$3
110	Second Floor	Classroom 205	2'x4' Recessed Troffer w/ Clear Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	11	86	946	2,200	2,081	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	11	72	300	Ceiling	1	792	1,900	1,742	1,505	14	154	300	339	238	\$91
111	Second Floor	Classroom 205	2'x2' Recessed Troffer, No Lens, w/ (2) FBO31T8/835, 32w 800 U- Lamps & (1) Electronic Ballast	1	64	64	2,200	140	None	1	64	300	Ceiling	1	64	1,900	140	121	0	0	300	0	19	\$3
112	Second Floor	Classroom 204	2'x4' Recessed Troffer w/ Clear Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	11	86	946	2,200	2,081	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	11	72	300	Ceiling	1	792	1,900	1,742	1,505	14	154	300	339	238	\$91
113	Second Floor	Classroom 204	2'x2' Recessed Troffer, No Lens, w/ (2) FBO31T8/835, 32w 800 U- Lamps & (1) Electronic Ballast	1	64	64	2,200	140	None	1	64	300	Ceiling	1	64	1,900	140	121	0	0	300	0	19	\$3
114	Second Floor	Classroom 202	2'x4' Recessed Troffer w/ Clear Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	11	86	946	2,200	2,081	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	11	72	300	Ceiling	1	792	1,900	1,742	1,505	14	154	300	339	238	\$91
115	Second Floor	Classroom 202	2'x2' Recessed Troffer, No Lens, w/ (2) FBO31T8/835, 32w 800 U- Lamps & (1) Electronic Ballast	1	64	64	2,200	140	None	1	64	300	Ceiling	1	64	1,900	140	121	0	0	300	0	19	\$3
116	Second Floor	Classroom 201	2'x4' Recessed Troffer w/ Clear Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	11	86	946	2,200	2,081	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	11	72	300	Ceiling	1	792	1,900	1,742	1,505	14	154	300	339	238	\$91
117	Second Floor	Classroom 201	2'x2' Recessed Troffer, No Lens, w/ (2) FBO31T8/835, 32w 800 U- Lamps & (1) Electronic Ballast	1	64	64	2,200	140	None	1	64	300	Ceiling	1	64	1,900	140	121	0	0	300	0	19	\$3
118	Second Floor	Board of Secretary	2'x4' Surface Fixture, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	345	2,200	759	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	4	72	300	Ceiling	1	288	1,900	634	547	14	57	300	125	86	\$33
119	Second Floor	Hallway	2'x2' Recessed Troffer, No Lens, w/ (2) FBO31T8/835, 32w 800 U- Lamps & (1) Electronic Ballast	5	64	318	5,000	1,590	None	5	64	0	Ceiling	0	318	5,000	1,590	1,590	0	0	0	0	0	\$0
120	Second Floor	Office	2'x4' Surface Fixture, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	86	259	2,200	569	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	3	72	300	Wall	1	216	1,900	475	410	14	43	300	94	65	\$25
121	Second Floor	Office	2'x4' Surface Fixture, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	86	259	2,200	569	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	3	72	300	Wall	1	216	1,900	475	410	14	43	300	94	65	\$25
122	Second Floor	Office	2'x4' Surface Fixture, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	86	259	2,200	569	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	3	72	300	Wall	1	216	1,900	475	410	14	43	300	94	65	\$25
123	Second Floor	Office	2'x4' Surface Fixture, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	86	259	2,200	569	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	3	72	300	Wall	1	216	1,900	475	410	14	43	300	94	65	\$25
124	Second Floor	Conference Room	2'x4' Surface Fixture, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	86	517	2,200	1,138	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	6	72	300	Ceiling	1	432	1,900	950	821	14	85	300	187	130	\$50
125	Second Floor	Office	2'x4' Surface Fixture, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	86	259	2,200	569	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	3	72	300	Wall	1	216	1,900	475	410	14	43	300	94	65	\$25
126	Second Floor	Meeting Room	2'x4' Surface Fixture, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	86	517	2,200	1,138	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	6	72	300	Wall	1	432	1,900	950	821	14	85	300	187	130	\$50
127	Second Floor	Bathroom	Recessed can fixture w/ no lens w/ (2) 18W Compact Fluorescent Lamp (CFL)	2	36	72	2,200	158	None	2	36	300	Ceiling	1	72	1,900	158	137	0	0	300	0	22	\$3
128	Second Floor	Bathroom	Recessed can fixture w/ no lens w/ (2) 18W Compact Fluorescent Lamp (CFL)	2	36	72	2,200	158	None	2	36	300	Ceiling	1	72	1,900	158	137	0	0	300	0	22	\$3
129	First Floor	Main Office Vestibule	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pandant, No Lens	8	68	546	2,200	1,200	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	8	49	300	Wall	1	392	1,900	862	745	19	154	300	338	118	\$72
130	First Floor	Main Office	4' Fluorescent Recessed Strip with (2) F32T8 700 Lamps & (1) Electronic Ballast, Prismatic Lens	11	62	682	2,200	1,500	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	11	49	300	Wall	1	539	1,900	1,186	1,024	13	143	300	315	162	\$75
131	First Floor	Principals Office	4' Fluorescent Recessed Strip with (2) F32T8 700 Lamps & (1) Electronic Ballast, Prismatic Lens	4	62	248	2,200	546	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	4	49	300	Ceiling	1	196	1,900	431	372	13	52	300	114	59	\$27
132	First Floor	Copy Room 3	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	8	62	496	2,200	1,091	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	8	48	300	Ceiling	1	384	1,900	845	730	14	112	300	246	115	\$57
133	First Floor	Conference Room 58	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	62	248	2,200	546	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	4	48	300	Ceiling	1	192	1,900	422	365	14	56	300	123	58	\$29
134	First Floor	Mens Faculty	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	62	62	5,000	310	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	1	48	300	Ceiling	1	48	4,700	240	226	14	14	300	70	14	\$13
135	First Floor	Classroom 52	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	7	86	602	2,200	1,324	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	7	72	300	Ceiling	1	504	1,900	1,109	958	14	98	300	216	151	\$58
136	First Floor	Classroom 55	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	9	62	558	2,200	1,228	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	9	48	300	Ceiling	1	432	1,900	950	821	14	126	300	277	130	\$64

COS		IS
TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
\$605	\$250	\$710
\$0	\$250	\$215
\$605	\$250	\$710
\$0	\$250	\$215
\$605	\$0	\$495
\$605	\$250	\$710
\$0	\$250	\$215
\$605	\$250	\$710
\$0	\$250	\$215
\$605	\$250	\$710
\$0	\$250	\$215
\$605	\$250	\$710
\$0	\$250	\$215
\$605	\$250	\$710
\$0	\$250	\$215
\$220	\$250	\$395
\$0	\$0	\$0
\$165	\$120	\$235
\$165	\$120	\$235
\$165	\$120	\$235
\$165	\$120	\$235
\$330	\$250	\$485
\$165	\$120	\$235
\$330	\$120	\$370
\$0	\$250	\$215
\$0	\$250	\$215
\$400	\$120	\$420
\$550	\$120	\$540
\$200	\$250	\$375
\$400	\$250	\$535
\$200	\$250	\$375
\$50	\$250	\$255
\$385	\$250	\$530
\$450	\$250	\$575

Do	me-Tech, Inc.		LIGHTING UPGRADE PROJECT LINE x LINE DETAIL		ISTOM CILITY				Dunellen Public Schools John P. Faber School			FAC	CILITY S 89,203				TE OF AU 12/12/20 <sup>2</sup>										
	SPACE	DESCRIPTION	EXISTING	FIXTU	RES					REP	LACE	MENT F	IXTURES	6							ENERG	Y ANAL	YSIS		COS		IS
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS 910	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS 910	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS) \$0.158	TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
137	First Floor	Room 55 Examiner	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	62	124	2,200	273	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	2	48	300	Ceiling	1	96	1,900	211	182	14	28	300	62	29	\$14	\$100	\$250	\$295
138	First Floor	Classroom 54	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	14	86	1,204	2,200	2,649	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	14	72	300	Ceiling	1	1,008	1,900	2,218	1,915	14	196	300	431	302	\$116	\$770	\$250	\$845
139	First Floor	Classroom 53	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	15	86	1,290	2,200	2,838	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	15	72	300	Ceiling	1	1,080	1,900	2,376	2,052	14	210	300	462	324	\$124	\$825	\$250	\$890
140	First Floor	Classroom 50	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	15	86	1,290	2,200	2,838	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	15	72	300	Ceiling	1	1,080	1,900	2,376	2,052	14	210	300	462	324	\$124	\$825	\$250	\$890
141	First Floor	Classroom 51	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	15	86	1,290	2,200	2,838	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	72	300	Ceiling	1	1,080	1,900	2,376	2,052	14	210	300	462	324	\$124	\$825	\$250	\$890	
142	First Floor	Classroom 8	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	345	2,200	759	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	72	300	Ceiling	1	288	1,900	634	547	14	57	300	125	86	\$33	\$220	\$250	\$395	
143	First Floor	Sprinkler Room	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Surface Mount, Prismatic Lens	1	68	68	500	34	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	1	49	0	Ceiling	0	49	500	25	25	19	19	0	10	0	\$2	\$50	\$0	\$40
142	First Floor	Hallway	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	86	259	5,000	1,293	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	3	72	300	Ceiling	1	216	4,700	1,080	1,015	14	43	300	213	65	\$44	\$165	\$250	\$350
143	First Floor	Hallway	4' Fluorescent Strip with (1) F32T8 & (1) Electronic Ballast, Recessed, No Lens	48	35	1,680	5,000	8,400	Relamp & Reballast w/ (1) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	48	25	300	Ceiling	1	1,200	4,700	6,000	5,640	10	480	300	2,400	360	\$435	\$2,160	\$250	\$1,895
142	First Floor	Hallway	2'x2' Recessed Troffer, No Lens, w/ (2) FBO31T8/835, 32w 800 U- Lamps & (1) Electronic Ballast	6	64	382	5,000	1,908	None	6	64	300	Ceiling	1	382	4,700	1,908	1,794	0	0	300	0	114	\$18	\$0	\$250	\$215
143	First Floor	Old to New Corridor	2'x2' Recessed Troffer, No Lens, w/ (2) FBO31T8/835, 32w 800 U- Lamps & (1) Electronic Ballast	5	64	318	5,000	1,590	None	5	64	0	Ceiling	0	318	5,000	1,590	1,590	0	0	0	0	0	\$0	\$0	\$0	\$0
144	Second Floor	Stairwell BOE	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	5	86	430	8,760	3,767	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	72	0	Ceiling	0	360	8,760	3,154	3,154	14	70	0	613	0	\$97	\$275	\$0	\$225	
145	Second Floor	Stairwell Gym	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	5	86	430	8,760	3,767	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	72	0	Ceiling	0	360	8,760	3,154	3,154	14	70	0	613	0	\$97	\$275	\$0	\$225	
146	-	Exit Signs	Exit Sign - 20W incandescent	14	20	280	8,760	2,453	5W LED Exit Sign	14	5	0	Ceiling	0	70	8,760	613	613	15	210	0	1,840	0	\$290	\$700	\$0	\$700
				996		107,390		254,685		996				120	74,062		176,534	157,316				78,151	19,218	15,362	70,570	28,570	80,945



## LIGHTING RETROFIT SUMMARY FOR: Lincoln Middle School 411 1st Street, Dunellen, NJ 08812

BUILDING INFOR	MATION	I	E	XISTING	G FIXTURE	S	F	ROPOS		ES			SA	VINGS							FINANC	IAL		
BUILDING	SQ. FT.		PRE TOTAL FIXT. QTY	PRE TOTAL FIXT. WATTS	PRE ANNUAL KWH CONSUMPTI ON	PRE WATTS / SQ. FT	POST TOTAL FIXT. QTY	POST TOTAL FIXT. WATTS	POST ANNUAL KWH CONSUMPTION	POST WATTS / SQ. FT	WATTS SAVED	ANNUAL KWH SAVED WITH FIXTURES		TOTAL ANNUAL KWH SAVED	ANNUAL SAVINGS \$ FIXT.	ANNUAL SAVING S \$ SENSOR S	ANNUAL SAVINGS \$ TOTAL	CO2 REDUCTION (TONS)	NJ Smart Start FIXTURE REBATE \$	NJ Smart Start SENSOR REBATE \$		SENSORS TOTAL (INSTALLED) COST \$	MATERIAL TOTAL (INSTALLED) COST \$	SIMPLE PAYBACK AFTER REBATE (YEARS)
Lincoln Middle Scho	26,248	3	458	33,373	102,536	1.27	456	26,450	81,735	1.01	6,923	20,801	6,325	27,125	\$3,245	\$987	\$4,232	6.9	\$4,340	\$1,960	\$22,320	\$11,000	\$33,320	6.4

6%	PERCENTAGE OF REBATES IN TOTAL INSTALLED COST
80%	PERCENTAGE OF CONSUMPTION COMPARE TO EXISTING STATE
38%	EXISTING PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING
30%	PROPOSED PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING
30%	PROPOSED PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING

Do	ne-Tech. Inc.		LIGHTING UPGRADE PROJECT LINE x LINE DETAIL		ISTOM CILITY				Dunellen Public Schools Lincoln Middle School			FAC	ILITY S 26,248			DAT	TE OF A		]					
	SPACE	DESCRIPTION								REF	PLACEN	IENT FL	XTURES								ENERG	Y ANAL	YSIS	
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS 910	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS 910	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS) \$0.156
1	2 Basement	3 Basement	4 4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pandant, Prismatic Lens	5 7	6 68	7 477	<b>8</b> 8,760	<b>9</b> 4,182	11 Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	12 7	<b>13</b> 49	14 1,500	15 Ceiling	16 2	17 343	18 7,260	19 3,005	<b>20</b> 2,490	<b>21</b> 19	22 134	23 1,500	24 1,177	25 515	26 \$264
2	Basement	Corridor	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pandant, Prismatic Lens	1	68	68	8,760	597	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	1	49	1,500	Ceiling	2	49	7,260	429	356	19	19	1,500	168	74	\$38
3	Basement	File Storage #1	2'x4' Wall Mounted, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Magnetic Ballast	1	144	144	500	72	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	0	98	0	Ceiling	0	0	500	0	0	46	0	0	0	0	\$0
4	Basement	Corridor	8' Surface Mount Fixture, Prismatic Lens, w/ (2) F96T12/75w Lamps & (1) Magnetic Ballast	1	142	142	8,760	1,240	New 4ft Strip fixture w /(2) 4ft F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	1	49	1,500	Ceiling	1	49	7,260	429	356	93	93	1,500	810	74	\$138
5	Basement	File Storage #1	2'x4' Surface Mount, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Magnetic Ballast	1	144	144	500	72	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	0	98	300	Ceiling	1	0	200	0	0	46	0	300	0	0	\$0
6	Basement	Small Corridor	2'x4' Wall Mounted, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Magnetic Ballast	1	144	144	8,760	1,261	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	1	98	1,500	Ceiling	1	98	7,260	858	711	46	46	1,500	403	147	\$86
7	Basement	Small Corridor	1'x4' Surface Mount Fixture, Prismatic Lens, w/ (2) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	1	66	66	8,760	578	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	1	49	300	Ceiling	1	49	8,460	429	415	17	17	300	149	15	\$26
8	Basement	Switch Room	1'x4' Surface Mount Fixture, Prismatic Lens, w/ (2) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	1	66	66	2,000	132	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	1	49	0	Ceiling	0	49	2,000	98	98	17	17	0	34	0	\$5
9	Basement	Switch Room	60W incandescent	3	60	180	2,000	360	18W CFL	3	18	0	Ceiling	0	54	2,000	108	108	42	126	0	252	0	\$39
10	Basement	Switch Room	Wall Mounted 4'Strip Fixture, No Lens, w/ (1) F40T12/34w Lamp & (1) Energy Saving Magnetic Ballast	2	40	79	2,000	159	Relamp & Reballast w/ (1) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	2	25	0	Ceiling	0	50	2,000	100	100	15	29	0	59	0	\$9
11	Basement	File Storage #2	2'x4' Surface Mount, Prismatic Lens, w/ (2) F40T12/34w Lamps & (1) Magnetic Ballast		66	66	2,200	145	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	1	49	300	Ceiling	1	49	1,900	108	93	17	17	300	37	15	\$8
12	Basement	Workshop	2'x4' Surface Mount Fixture, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	62	248	8,760	2,172	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	4	49	0	Ceiling	0	196	8,760	1,717	1,717	13	52	0	456	0	\$71
13	Basement	Boiler Room	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pandant, No Lens	3	68	205	8,760	1,792	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	3	49	0	Ceiling	0	147	8,760	1,288	1,288	19	58	0	505	0	\$79
14	Basement	Closet #1	Wall Mounted Fixture - 150W incandescent	1	150	150	2,200	330	42 Watt LED Wall Pack	1	42	0	Ceiling	0	42	2,200	92	92	108	108	0	238	0	\$37
15	Basement	Closet #2	Wall Mounted Fixture - 150W incandescent	1	150	150	2,200	330	42 Watt LED Wall Pack	1	42	0	Ceiling	0	42	2,200	92	92	108	108	0	238	0	\$37
16	Basement	Closet #2	60W incandescent	1	60	60	2,200	132	18W CFL	1	18	0	Ceiling	0	18	2,200	40	40	42	42	0	92	0	\$14
17	First Floor	Stariwell L-B	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Surface Mount, Prismatic Lens	2	68	136	8,760	1,195	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	2	49	0	Ceiling	0	98	8,760	858	858	19	38	0	336	0	\$52
18	First Floor	Mechanical Room	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pandant, Prismatic Lens	6	68	409	2,200	900	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	6	49	0	Ceiling	0	294	2,200	647	647	19	115	0	253	0	\$40
19	First Floor	Cafeteria Hallway	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	5	62	310	5,000	1,550	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	5	49	0	Ceiling	0	245	5,000	1,225	1,225	13	65	0	325	0	\$51
20	First Floor	Cafeteria Hallway	Screw-in Compact Fluorescent Lamp (23W)	7	23	161	5,000	805	None	7	23	0	Ceiling	0	161	5,000	805	805	0	0	0	0	0	\$0
21	First Floor	Janitor's Closet	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pandant, Prismatic Lens	1	68	68	500	34	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	1	49	0	Ceiling	0	49	500	25	25	19	19	0	10	0	\$1
22	First Floor	Girls Room	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	5	62	310	2,200	682	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	5	49	300	Ceiling	1	245	1,900	539	466	13	65	300	143	74	\$34
23	First Floor	Boys Room	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	5	62	310	2,200	682	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	5	49	300	Ceiling	1	245	1,900	539	466	13	65	300	143	74	\$34
24	First Floor	Cafeteria	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	36	62	2,232	2,200	4,910	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	36	49	300	Ceiling	1	1,764	1,900	3,881	3,352	13	468	300	1,030	529	\$243
25	First Floor	Cafeteria Closet	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pandant, Prismatic Lens	3	68	205	500	102	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	3	49	0	Ceiling	0	147	500	74	74	19	58	0	29	0	\$4
26	First Floor	Kitchen	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	9	62	558	2,200	1,228	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	9	49	0	Ceiling	0	441	2,200	970	970	13	117	0	257	0	\$40
27	First Floor	Kitchen Hallway	2'x4' Surface Mount, Prismatic Lens, w/ (2) F40T12/34w Lamps & (1) Magnetic Ballast	1	66	66	5,000	330	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	1	49	0	Ceiling	0	49	5,000	245	245	17	17	0	85	0	\$13
28	First Floor	Faculty Room	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	10	62	620	2,200	1,364	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	10	49	300	Ceiling	1	490	1,900	1,078	931	13	130	300	286	147	\$68
29	First Floor	Faculty Room	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	62	62	2,200	136	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	1	49	300	Ceiling	1	49	1,900	108	93	13	13	300	29	15	\$7
30	First Floor	Faculty Room	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	62	62	2,200	136	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	1	49	300	Ceiling	1	49	1,900	108	93	13	13	300	29	15	\$7
31	First Floor	Ramp	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	7	62	434	5,000	2,170	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	7	49	0	Ceiling	0	343	5,000	1,715	1,715	13	91	0	455	0	\$71
32	First Floor	Ramp	Screw-in Compact Fluorescent Lamp (23W)	1	23	23	5,000	115	None	1	23	0	Ceiling	0	23	5,000	115	115	0	0	0	0	0	\$0
33	First Floor	Classroom L6	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	62	372	2,200	818	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	6	49	300	Ceiling	1	294	1,900	647	559	13	78	300	172	88	\$41
34	First Floor	Main Entrance	Screw-in Compact Fluorescent Lamp (23W)	10	23	230	5,000	1,150	None	10	23	0	Ceiling	0	230	5,000	1,150	1,150	0	0	0	0	0	\$0

COS		S
TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
27	28	29
\$350	\$500	\$500
\$50	\$500	\$260
\$0	\$0	\$0
\$100	\$250	\$305
\$0	\$250	\$215
\$60	\$250	\$265
\$50	\$250	\$255
\$50	\$0	\$40
\$15	\$0	\$15
\$100	\$0	\$80
\$50	\$250	\$255
\$200	\$0	\$160
\$150	\$0	\$120
\$235	\$0	\$135
\$235	\$0	\$135
\$5	\$0	\$5
\$100	\$0	\$80
\$300	\$0	\$240
\$250	\$0	\$200
\$0	\$0	\$0
\$50	\$0	\$40
\$250	\$250	\$415
\$250	\$250	\$415
\$1,800	\$250	\$1,655
\$150	\$0	\$120
\$450	\$0	\$360
\$50	\$0	\$40
\$500	\$250	\$615
\$50	\$250	\$255
\$50	\$250	\$255
\$350	\$0	\$280
\$0	\$0	\$0
\$300	\$250	\$455
\$0	\$0	\$0

Don	Pie-Tech, Inc.		LIGHTING UPGRADE PROJECT LINE x LINE DETAIL						Dunellen Public Schools Lincoln Middle School	FACILITY SQ. FT.         DATE OF AUDIT:           26,248         1/1/2013								]									
SPACE DESCRIPTION									REPLACEMENT FIXTURES										ENERGY ANALYSIS						COST ANALYSIS		
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS 910	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS 910	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS) \$0.156	TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
35	First Floor	Art Room L1	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	13	62	806	2,200	1,773	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	13	49	300	Ceiling	1	637	1,900	1,401	1,210	13	169	300	372	191	\$88	\$650	\$250	\$735
36	First Floor	Main Entrance Hallway	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	62	248	5,000	1,240	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	4	49	0	Ceiling	0	196	5,000	980	980	13	52	0	260	0	\$41	\$200	\$0	\$160
37	First Floor	Main Entrance Hallway	2'x2' Recessed Troffer, Prismatic Lens, w/ (2) FBO32T8/835, 32w 800 Lamps & (1) Electronic Ballast	2	62	124	5,000	620	New 2'x2' Recessed Troffer, silver reflectors, no Lens, w/ (3) F17T8,17w 800 Lamps & (1) Electronic Ballast	2	50	0	Ceiling	0	100	5,000	500	500	12	24	0	120	0	\$19	\$100	\$0	\$80
38	First Floor	Hallway	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	7	62	434	5,000	2,170	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	7	49	0	Ceiling	0	343	5,000	1,715	1,715	13	91	0	455	0	\$71	\$350	\$0	\$280
39	First Floor	Classroom L2	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	9	86	776	2,200	1,707	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	9	72	300	Ceiling	1	648	1,900	1,426	1,231	14	128	300	281	194	\$74	\$495	\$250	\$620
40	First Floor	Classroom L5	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	12	86	1,034	2,200	2,276	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	12	72	300	Ceiling	1	864	1,900	1,901	1,642	14	170	300	375	259	\$99	\$660	\$250	\$755
41	First Floor	Classroom L3	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	9	86	776	2,200	1,707	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	9	72	300	Ceiling	1	648	1,900	1,426	1,231	14	128	300	281	194	\$74	\$495	\$250	\$620
42	First Floor	Classroom L4	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	12	86	1,034	2,200	2,276	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	12	72	300	Ceiling	1	864	1,900	1,901	1,642	14	170	300	375	259	\$99	\$660	\$250	\$755
43	First Floor	Connecting Bridge	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	345	5,000	1,724	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	4	72	0	Ceiling	0	288	5,000	1,440	1,440	14	57	0	284	0	\$44	\$220	\$0	\$180
44	First Floor	Connecting Bridge	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	5,000	862	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	2	72	0	Ceiling	0	144	5,000	720	720	14	28	0	142	0	\$22	\$110	\$0	\$90
45	First Floor	Connecting Bridge	2'x2' Recessed Troffer, No Lens, w/ (2) FBO31T8/835, 32w 800 U Lamps & (1) Electronic Ballast	<sup>,</sup> 11	64	700	5,000	3,498	None	11	64	0	Ceiling	0	700	5,000	3,498	3,498	0	0	0	0	0	\$0	\$0	\$0	\$0
46	First Floor	Electrical Room	4' Fluorescent Strip with (1) F32T8 & (1) Electronic Ballast, Pandant, No Lens	2	35	70	500	35	Relamp & Reballast w/ (1) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	2	25	0	Ceiling	0	50	500	25	25	10	20	0	10	0	\$2	\$90	\$0	\$70
47	First Floor	Girls Room	Recessed 4ft Strip, Prismatic, w/ (3) F32T8 32w Lamps & (1) Electronic Ballast	2	100	200	2,200	440	Relamp & Reballast w/ (3) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	2	72	300	Ceiling	1	144	1,900	317	274	28	56	300	123	43	\$26	\$110	\$250	\$305
48	First Floor	Boys Room	Recessed 4ft Strip, Prismatic, w/ (3) F32T8 32w Lamps & (1) Electronic Ballast	2	100	200	2,200	440	Relamp & Reballast w/ (3) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	2	72	300	Ceiling	1	144	1,900	317	274	28	56	300	123	43	\$26	\$110	\$250	\$305
49	Third Floor	Floor 3	2'x4' Recessed Troffer, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	7	62	434	2,200	955	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	7	49	0	Ceiling	0	343	2,200	755	755	13	91	0	200	0	\$31	\$350	\$0	\$280
50	Third Floor	Corridor	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	5,000	862	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	2	72	0	Ceiling	0	144	5,000	720	720	14	28	0	142	0	\$22	\$110	\$0	\$90
51	Third Floor	Closet	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	500	43	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	1	72	0	Ceiling	0	72	500	36	36	14	14	0	7	0	\$1	\$55	\$0	\$45
52	Third Floor	Stairwell	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	8,760	1,510	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	2	72	0	Ceiling	0	144	8,760	1,261	1,261	14	28	0	249	0	\$39	\$110	\$0	\$90
53	Second Floor	Stairwell	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	8,760	1,510	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	2	72	0	Ceiling	0	144	8,760	1,261	1,261	14	28	0	249	0	\$39	\$110	\$0	\$90
54	First Floor	Stairwell	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	8,760	755	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	1	72	0	Ceiling	0	72	8,760	631	631	14	14	0	124	0	\$19	\$55	\$0	\$45
55	Second Floor	Girls Room	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,200	378	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	2	72	300	Ceiling	1	144	1,900	317	274	14	28	300	62	43	\$16	\$110	\$250	\$305
56	Second Floor	Boys Room	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	2,200	189	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	1	72	300	Ceiling	1	72	1,900	158	137	14	14	300	31	22	\$8	\$55	\$250	\$260
57	Second Floor	Girls Room	2'x2' Recessed Troffer, Prismatic Lens, w/ (2) FBO32T8/835, 32w 800 Lamps & (1) Electronic Ballast	′ 1	62	62	2,200	136	New 2'x2' Recessed Troffer, silver reflectors, no Lens, w/ (3) F17T8,17w 800 Lamps & (1) Electronic Ballast	1	50	300	Ceiling	1	50	1,900	110	95	12	12	300	26	15	\$6	\$50	\$250	\$255
58	Second Floor	Boys Room	2'x2' Recessed Troffer, Prismatic Lens, w/ (2) FBO32T8/835, 32w 800 Lamps & (1) Electronic Ballast	2	62	124	2,200	273	New 2'x2' Recessed Troffer, silver reflectors, no Lens, w/ (3) F17T8,17w 800 Lamps & (1) Electronic Ballast	2	50	300	Ceiling	1	100	1,900	220	190	12	24	300	53	30	\$13	\$100	\$250	\$295
59	Second Floor	High School Link	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	8,760	1,507	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	2	72	0	Ceiling	0	144	8,760	1,261	1,261	14	28	0	245	0	\$38	\$110	\$0	\$90
60	Second Floor	Locker Corridor	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	86	258	5,000	1,290	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	3	72	0	Ceiling	0	216	5,000	1,080	1,080	14	42	0	210	0	\$33	\$165	\$0	\$135
61	Second Floor	Mechanical Room	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pandant, No Lens	2	68	136	500	68	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	2	49	0	Ceiling	0	98	500	49	49	19	38	0	19	0	\$3	\$100	\$0	\$80
62	Second Floor	Ramp	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	86	516	5,000	2,580	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	6	72	0	Ceiling	0	432	5,000	2,160	2,160	14	84	0	420	0	\$66	\$330	\$0	\$270
63	Second Floor	Ramp	2'x2' Recessed Troffer, Prismatic Lens, w/ (2) FBO32T8/835, 32w 800 Lamps & (1) Electronic Ballast	8	62	496	5,000	2,480	New 2'x2' Recessed Troffer, silver reflectors, no Lens, w/ (3) F17T8,17w 800 Lamps & (1) Electronic Ballast	8	50	0	Ceiling	0	400	5,000	2,000	2,000	12	96	0	480	0	\$75	\$400	\$0	\$320
64	Second Floor	Faculty Bathroom	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	2,200	189	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	1	72	300	Ceiling	1	72	1,900	158	137	14	14	300	31	22	\$8	\$55	\$250	\$260
65	Second Floor	Locker Corridor	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	7	62	434	5,000	2,170	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	7	49	0	Ceiling	0	343	5,000	1,715	1,715	13	91	0	455	0	\$71	\$350	\$0	\$280
66	Second Floor	Classroom L11	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	12	86	1,034	2,200	2,276	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	12	72	300	Ceiling	1	864	1,900	1,901	1,642	14	170	300	375	259	\$99	\$660	\$250	\$755
67	Second Floor	Classroom L12	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	12	86	1,034	2,200	2,276	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	12	72	300	Ceiling	1	864	1,900	1,901	1,642	14	170	300	375	259	\$99	\$660	\$250	\$755
68	Second Floor	Classroom L13	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	12	86	1,034	2,200	2,276	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	12	72	300	Ceiling	1	864	1,900	1,901	1,642	14	170	300	375	259	\$99	\$660	\$250	\$755

Dome-Tech	Inc.		LIGHTING UPGRADE PROJECT LINE x LINE DETAIL		STOM CILITY				Dunellen Public Schools Lincoln Middle School			FAC	CILITY S 26,248			DA	TE OF A	-									
SP		ESCRIPTION							REPLACEMENT FIXTURES										ENERGY ANALYSIS						COST ANALYSIS		
LINE FLC	DOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS 910	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS 910	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS) \$0.156	TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
69 Secon	d Floor	Classroom L10	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	12	86	1,034	2,200	2,276	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	12	72	300	Ceiling	1	864	1,900	1,901	1,642	14	170	300	375	259	\$99	\$660	\$250	\$755
70 Secon	d Floor	Classroom L9	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	14	86	1,207	2,200	2,655	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	14	72	300	Ceiling	1	1,008	1,900	2,218	1,915	14	199	300	437	302	\$115	\$770	\$250	\$845
71 Secon	d Floor	Closet	Recessed round fixture, No lens w/ (1) 32W Compact Fluorescent Lamp (CFL)	1	32	32	500	16	None	1	32	0	Ceiling	0	32	500	16	16	0	0	0	0	0	\$0	\$0	\$0	\$0
72 Secon	d Floor	Closet	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	62	62	500	31	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	1	49	0	Ceiling	0	49	500	25	25	13	13	0	7	0	\$1	\$50	\$0	\$40
73 Secon	d Floor	Classroom L8	Reccesed canopy lighting - 75 incandescent	1	75	75	2,200	165	Relamp 20 Watt LED Screw-in	1	20	300	Ceiling	1	20	1,900	44	38	55	55	300	121	6	\$20	\$20	\$250	\$235
74 Secon	d Floor	Classroom L8	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	2,200	189	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	1	72	300	Ceiling	1	72	1,900	158	137	14	14	300	31	22	\$8	\$55	\$250	\$260
75 Secon	d Floor	Classroom L8	75W incandescent	5	75	375	2,200	825	23W CFL	5	23	300	Ceiling	1	115	1,900	253	219	52	260	300	572	35	\$95	\$25	\$250	\$240
76 Secon	d Floor	Classroom L7	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	15	86	1,290	2,200	2,838	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	15	72	300	Ceiling	1	1,080	1,900	2,376	2,052	14	210	300	462	324	\$123	\$825	\$250	\$890
77 Secon	d Floor	Classroom L14	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	19	62	1,178	2,200	2,592	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	19	49	300	Ceiling	1	931	1,900	2,048	1,769	13	247	300	543	279	\$128	\$950	\$250	\$975
78 Secon	d Floor	Classroom L15	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	62	186	2,200	409	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	3	49	300	Ceiling	1	147	1,900	323	279	13	39	300	86	44	\$20	\$150	\$250	\$335
79 Secon	d Floor	Restroom	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	62	62	2,200	136	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	1	49	300	Ceiling	1	49	1,900	108	93	13	13	300	29	15	\$7	\$50	\$250	\$255
80 Secon	d Floor	Stairwell	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	62	186	8,760	1,629	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	3	49	0	Ceiling	0	147	8,760	1,288	1,288	13	39	0	342	0	\$53	\$150	\$0	\$120
81 First	Floor	Stairwell	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	62	248	8,760	2,172	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	4	49	0	Ceiling	0	196	8,760	1,717	1,717	13	52	0	456	0	\$71	\$200	\$0	\$160
82 Secon	d Floor	Classroom L16	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	15	86	1,290	2,200	2,838	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	15	72	300	Ceiling	1	1,080	1,900	2,376	2,052	14	210	300	462	324	\$123	\$825	\$250	\$890
83 Secon	d Floor	Classroom L17	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	86	516	2,200	1,135	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	6	72	300	Ceiling	1	432	1,900	950	821	14	84	300	185	130	\$49	\$330	\$250	\$485
84 Secon	d Floor	Classroom L18	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	15	86	1,290	2,200	2,838	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	15	72	300	Ceiling	1	1,080	1,900	2,376	2,052	14	210	300	462	324	\$123	\$825	\$250	\$890
85 Secon	d Floor	Classroom L19	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	18	86	1,548	2,200	3,406	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	18	72	300	Ceiling	1	1,296	1,900	2,851	2,462	14	252	300	554	389	\$147	\$990	\$250	\$1,025
86 Secon	d Floor	Janitor's Closet	1'x4' Wall Mount, Prismatic Lens with w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast, Wireguard	1	62	62	500	31	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	1	49	0	Ceiling	0	49	500	25	25	13	13	0	7	0	\$1	\$50	\$0	\$40
				458		33,373		102,536		456	4,796	17,400	0	44	26,450		81,735	75,411	0	6,635		20,657	6,325	\$4,209	\$22,320	\$11,000	\$27,020

	PRE FIXTURE DESCRIPTION	PRE WATTS / FIXT.	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.						TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
	4	6	11	12	13						27	28	29



# LIGHTING RETROFIT SUMMARY FOR: High School 411 1st Street, Dunellen, NJ 08812

i	BUILDING INFORM	ATION	E	XISTING	FIXTURI	ES	Р	ROPOS		ES			S	AVINGS							FINAN	CIAL		
	BUILDING	SQ. FT.	PRE TOTAL FIXT. QTY	PRE TOTAL FIXT. WATTS	PRE ANNUAL KWH CONSUMPTI ON	PRE WATTS / SQ. FT	POST TOTAL FIXT. QTY	POST TOTAL FIXT. WATTS	POST ANNUAL KWH CONSUMPTION	POST WATTS / SQ. FT	WATTS SAVED	ANNUAL KWH SAVED WITH FIXTURES	ANNUAL KWH SAVED WITH SENSORS	TOTAL ANNUAL KWH SAVED	ANNUAL SAVINGS \$ FIXT.	ANNUAL SAVINGS \$ SENSORS	ANNUAL SAVINGS \$ TOTAL	CO2 REDUCTION (TONS)	Start FIXTURE	NJ Smart Start SENSOR REBATE \$	FIXTURES TOTAL (INSTALLED) COST \$	SENSORS TOTAL (INSTALLED) COST \$	MATERIAL TOTAL (INSTALLED) COST \$	SIMPLE PAYBACK AFTER REBATE (YEARS)
	High School	77,794	0	80,803	196,585	1.04	805	60,482	149,634	0.78	20,321	46,951	13,855	60,807	\$7,295	\$2,153	\$9,448	15.5	12,690	10,055	\$58,400	\$23,090	\$81,490	6.2

12%	PERCENTAGE OF REBATES IN TOTAL INSTALLED COST
76%	PERCENTAGE OF CONSUMPTION COMPARE TO EXISTING STATE
43%	EXISTING PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING
33%	PROPOSED PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING

Dome-Tech,	Inc.	LIGHTING UPGRADE PROJECT LINE x LINE DETAIL						Dunellen Public Schools High School			FAC	ILITY S 77,794				TE OF A 12/31/20	-	]					
SPA	CE DESCRIPTION								RE	PLACEN	IENT FI	TURES								ENERG	Y ANAL	YSIS	· · · · · · · · · · · · · · · · · · ·
LINE FLOO	DR SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS 910	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS 910	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS) \$0.155
1 2	3	4 2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700	5	6	7	8	9	11 Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1 Third F	loor Hallway	Lamps & (1) Electronic Ballast	10	107	1,067	5,000	5,335	High Efficiency Ballast	10	98	0	Ceiling	0	980	5,000	4,900	4,900	9	87	0	435	0	\$68
2 Third F	loor Classroom 201	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	10	62	620	2,200	1,364	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	10	49	300	Ceiling	1	490	1,900	1,078	931	13	130	300	286	147	\$67
3 Third F	loor Art Room 202	8' Pandant strip with matte reflector, No Lens, w/ (4) F32T8/32w 800 Lamps & (1) Electronic Ballast	1	107	107	2,200	235	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	1	98	300	Ceiling	1	98	1,900	216	186	9	9	300	19	29	\$8
4 Third F	loor Art Room 202	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	20	107	2,134	2,200	4,695	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	20	98	300	Ceiling	1	1,960	1,900	4,312	3,724	9	174	300	383	588	\$151
5 Third F	loor AV Closet	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	107	213	500	107	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	2	98	0	Ceiling	0	196	500	98	98	9	17	0	9	0	\$1
6 Third F	loor Classroom 203	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	107	640	2,200	1,408	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	6	98	300	Ceiling	1	588	1,900	1,294	1,117	9	52	300	115	176	\$45
7 Third F	loor Classroom 204	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	12	107	1,280	2,200	2,817	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	12	98	300	Ceiling	1	1,176	1,900	2,587	2,234	9	104	300	230	353	\$91
8 Third F	loor Classroom 205	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	12	107	1,280	2,200	2,817	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	12	98	300	Ceiling	1	1,176	1,900	2,587	2,234	9	104	300	230	353	\$91
9 Third F	loor Classroom 206	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	14	107	1,494	2,200	3,286	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	14	98	300	Ceiling	1	1,372	1,900	3,018	2,607	9	122	300	268	412	\$106
10 Third F	loor Classroom 207	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	107	107	2,200	235	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	1	98	300	Ceiling	1	98	1,900	216	186	9	9	300	19	29	\$8
11 Third F	loor Classroom 208	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	12	107	1,280	2,200	2,817	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	12	98	300	Ceiling	1	1,176	1,900	2,587	2,234	9	104	300	230	353	\$91
12 Third F	loor Girls Room	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	344	2,200	757	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	4	72	300	Ceiling	1	288	1,900	634	547	14	56	300	123	86	\$33
13 Third F	loor Boys Room	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	107	213	2,200	469	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	2	98	300	Ceiling	1	196	1,900	431	372	9	17	300	38	59	\$15
14 Third F	loor Stairwell	1'x4' Pandant Fixture, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	62	62	8,760	543	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	1	49	0	Ceiling	0	49	8,760	429	429	13	13	0	114	0	\$18
15 Second	Floor GYM	400W Metal Halide Fixture with Wireguard	20	460	9,200	2,200	20,240	4 Lamp F54T5HO/ (54W) High Bay Fixture with Wireguard	20	236	300	Ceiling	4	4,720	1,900	10,384	8,968	224	4,480	300	9,856	1,416	\$1,751
16 Third F	loor AV Closet	Wall Mounted-60W incandescent	1	60	60	500	30	23W Screw in CFL	1	18	0	Ceiling	0	18	500	9	9	42	42	0	21	0	\$3
17 Second	Floor Closet	60W incandescent	2	60	120	500	60	23W Screw in CFL	2	18	0	Ceiling	0	36	500	18	18	42	84	0	42	0	\$7
18 Second	Floor Storage	60W incandescent	1	60	60	500	30	23W Screw in CFL	1	18	0	Ceiling	0	18	500	9	9	42	42	0	21	0	\$3
19 Second	Floor GYM Loft	60W incandescent	5	60	300	500	150	23W Screw in CFL	5	18	0	Ceiling	0	90	500	45	45	42	210	0	105	0	\$16
20 Second	Floor GYM Loft	8' Pandant Mount, Prismatic Lens, w/ (2) F96T12/95w Lamps & (1 Magnetic Ballast	) 5	142	708	500	354	New 8-ft Strip fixture w /(4) 4ft F28T8 Lamps & (1) Elec. Low- Power High Efficiency Ballast	5	98	0	Ceiling	0	490	500	245	245	44	218	0	109	0	\$17
21 Second	Floor Boys Locker Room	Recessed 4ft Strip, Prismatic, w/ (4) F32T8/32w Lamps & (1) Electronic Ballast	4	131	524	2,200	1,153	Retrofit fixture with (4) LED Tubes	4	80	0	Wall	0	320	2,200	704	704	51	204	0	449	0	\$70
22 Second	Floor Office	1'x4' Surface Fixture, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	62	62	2,200	136	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	1	49	300	Wall	1	49	1,900	108	93	13	13	300	29	15	\$7
23 Second	Floor Office	1'x4' Surface Fixture, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	62	62	2,200	136	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	1	49	300	Wall	1	49	1,900	108	93	13	13	300	29	15	\$7
24 Second	Floor Office	Recessed 4ft Strip, Prismatic, w/ (4) F32T8/32w Lamps & (1) Electronic Ballast	1	131	131	2,200	288	Retrofit fixture with (4) LED Tubes	1	80	300	Wall	1	80	1,900	176	152	51	51	300	112	24	\$21
25 Second	Floor Office	1'x4' Surface Fixture, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	) 1	62	62	2,200	136	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	1	49	300	Wall	1	49	1,900	108	93	13	13	300	29	15	\$7
26 Second	Floor Girls Locker Room Stairs	1'x4' Surface Fixture, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	62	62	2,200	136	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	1	49	0	Ceiling	0	49	2,200	108	108	13	13	0	29	0	\$4
27 Second	Floor Classroom 101	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	9	107	960	2,200	2,113	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	9	98	300	Ceiling	1	882	1,900	1,940	1,676	9	78	300	172	265	\$68
28 Second	Floor Classroom 102	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	107	320	2,200	704	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	3	98	300	Ceiling	1	294	1,900	647	559	9	26	300	57	88	\$23
29 Second	Floor Classroom 103	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	9	107	960	2,200	2,113	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	9	98	300	Ceiling	1	882	1,900	1,940	1,676	9	78	300	172	265	\$68
30 Second	Floor Classroom 104	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	9	107	960	2,200	2,113	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	9	98	300	Ceiling	1	882	1,900	1,940	1,676	9	78	300	172	265	\$68
31 Second	Floor Closet	60W incandescent	2	60	120	500	60	23W Screw in CFL	2	18	0	Ceiling	0	36	500	18	18	42	84	0	42	0	\$7
32 Second	Floor Girls Room	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	107	213	2,200	469	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	2	98	300	Ceiling	1	196	1,900	431	372	9	17	300	38	59	\$15
33 Second	Floor Classroom 105	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	9	107	960	2,200	2,113	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	9	98	300	Ceiling	1	882	1,900	1,940	1,676	9	78	300	172	265	\$68
34 Second	Floor Classroom 106	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	107	640	2,200	1,408	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	6	98	300	Ceiling	1	588	1,900	1,294	1,117	9	52	300	115	176	\$45

COS		S
TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
<b>27</b> \$600	<b>28</b> \$0	<b>29</b> \$500
\$500	\$250	\$615
\$60	\$250	\$265
\$1,200	\$250	\$1,215
\$120	\$0	\$100
\$360	\$250	\$515
\$720	\$250	\$815
\$720	\$250	\$815
\$840	\$250	\$915
\$60	\$250	\$265
\$720	\$250	\$815
\$220	\$250	\$395
\$120	\$250	\$315
\$55	\$0	\$45
\$8,000	\$1,000	\$4,760
\$5	\$0	\$5
\$10	\$0	\$10
\$5	\$0	\$5
\$25	\$0	\$25
\$500	\$0	\$450
\$600	\$0	\$440
\$50	\$120	\$140
\$50	\$120	\$140
\$150	\$120	\$210
\$50	\$120	\$140
\$50	\$0	\$40
\$540	\$250	\$665
\$180	\$250	\$365
\$540	\$250	\$665
\$540	\$250	\$665
\$10	\$0	\$10
\$120	\$250	\$315
\$540	\$250	\$665
\$360	\$250	\$515

D	2 ne-Tech. Inc.		LIGHTING UPGRADE PROJECT LINE x LINE DETAIL		ISTOM CILITY				Dunellen Public Schools High School			FAC	ILITY S 77,794				TE OF A 12/31/20	-						
		DESCRIPTION								REF	PLACEN	IENT FI)	TURES								ENERG	Y ANAL	YSIS	
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	default ANNUAL HOURS 910	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS 910	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS) \$0.155
35	Second Floor	Classroom 107	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	107	640	2,200	1,408	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	6	98	300	Ceiling	1	588	1,900	1,294	1,117	9	52	300	115	176	\$45
36	Second Floor	Classroom 108	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	107	107	2,200	235	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	1	98	300	Ceiling	1	98	1,900	216	186	9	9	300	19	29	\$8
37	Second Floor	Weight Room	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	10	107	1,067	2,200	2,347	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	10	98	300	Ceiling	1	980	1,900	2,156	1,862	9	87	300	191	294	\$75
38	Second Floor	Computer Lab	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	9	86	776	2,200	1,707	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	9	72	300	Ceiling	1	648	1,900	1,426	1,231	14	128	300	281	194	\$74
39	Second Floor	Typing Room	1'x4' Surface Fixture with matte reflector, Prismatic Lens, w/ (4) F32T8/32w 800 Lamps & (1) Electronic Ballast	16	107	1,707	2,200	3,756	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	16	98	300	Ceiling	1	1,568	1,900	3,450	2,979	9	139	300	306	470	\$121
40	Second Floor	Main Office	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	107	640	2,200	1,408	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	6	98	300	Wall	1	588	1,900	1,294	1,117	9	52	300	115	176	\$45
41	Second Floor	Office 1	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	107	213	2,200	469	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	2	98	300	Wall	1	196	1,900	431	372	9	17	300	38	59	\$15
42	Second Floor	Office 2	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	107	213	2,200	469	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	2	98	300	Wall	1	196	1,900	431	372	9	17	300	38	59	\$15
43	Second Floor	Office 3	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	107	213	2,200	469	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	2	98	300	Wall	1	196	1,900	431	372	9	17	300	38	59	\$15
44	Second Floor	Office 4	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	107	213	2,200	469	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	2	98	300	Wall	1	196	1,900	431	372	9	17	300	38	59	\$15
45	Second Floor	Office 5	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	107	213	2,200	469	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	2	98	300	Wall	1	196	1,900	431	372	9	17	300	38	59	\$15
46	Second Floor	Office 6	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	107	427	2,200	939	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	4	98	300	Wall	1	392	1,900	862	745	9	35	300	77	118	\$30
47	Second Floor	Room 6	60W incandescent	4	60	240	2,200	528	23W Screw in CFL	4	18	300	Ceiling	1	72	1,900	158	137	42	168	300	370	22	\$61
48	Second Floor	Stairwell	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	107	213	8,760	1,869	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	2	98	0	Ceiling	0	196	8,760	1,717	1,717	9	17	0	152	0	\$24
49	Second Floor	Auditorium	60W incandescent	3	60	180	500	90	23W Screw in CFL	3	18	300	Ceiling	1	54	200	27	11	42	126	300	63	16	\$12
50	Second Floor	Auditorium	Surface Mount 400W Metal Halide Fixture with Prismatic Lens (Auditorium)	9	460	4,140	500	2,070	4 Lamp F54T5HO/ (54W) High Bay Fixture	9	236	300	Ceiling	4	2,124	200	1,062	425	224	2,016	300	1,008	637	\$256
51	Second Floor	Library	1'x4' Surface Fixture, No Lens, w/ (2) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	24	66	1,584	2,200	3,485	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	24	49	300	Ceiling	3	1,176	1,900	2,587	2,234	17	408	300	898	353	\$194
52	Second Floor	Library - Stacks	2'x4' Surface Fixture, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	107	640	2,200	1,408	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	6	98	300	Ceiling	2	588	1,900	1,294	1,117	9	52	300	115	176	\$45
53	Second Floor	Library - Stacks	2'x2' Recessed Troffer, Prismatic Lens, w/ (2) FBO32T8/835, 32w 800 Lamps & (1) Electronic Ballast	6	62	372	2,200	818	New 2'x2' Recessed Troffer, silver reflectors, no Lens, w/ (2) F17T8,17w 800 Lamps & (1) Electronic Ballast	6	33	300	Ceiling	2	198	1,900	436	376	29	174	300	383	59	\$69
54	Second Floor	Computer Room	2'x2' Recessed Troffer, Prismatic Lens, w/ (2) F20T12/20w Lamps & (1) Magnetic Ballast	4	42	166	2,200	366	Relamp & Reballast w/ (2) F17T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	4	34	300	Ceiling	1	136	1,900	299	258	8	30	300	67	41	\$17
55	Second Floor	Office A	1'x4' Surface Fixture, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	62	248	2,200	546	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	4	49	300	Wall	1	196	1,900	431	372	13	52	300	114	59	\$27
56	Second Floor	Office B	2'x2' Recessed Troffer, Prismatic Lens, w/ (2) F20T12/20w Lamps & (1) Magnetic Ballast	1	42	42	2,200	92	Relamp & Reballast w/ (2) F17T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	1	34	300	Wall	1	34	1,900	75	65	8	8	300	17	10	\$4
57	Second Floor	Corridor	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	8	107	854	5,000	4,268	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	8	98	0	Ceiling	0	784	5,000	3,920	3,920	9	70	0	348	0	\$54
58	Second Floor	Classroom 113	2'x4' Surface Fixture, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	62	372	2,200	818	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	6	49	300	Ceiling	1	294	1,900	647	559	13	78	300	172	88	\$40
59	Second Floor	Boys Room	1'x4' Surface Fixture, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	62	186	2,200	409	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	3	49	300	Ceiling	1	147	1,900	323	279	13	39	300	86	44	\$20
60	Second Floor	Quiet Room	1'x4' Surface Fixture with matte reflector, Prismatic Lens, w/ (4) F32T8/32w 800 Lamps & (1) Electronic Ballast	1	107	107	2,200	235	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	1	98	300	Ceiling	1	98	1,900	216	186	9	9	300	19	29	\$8
61	Second Floor	Girls Room	1'x4' Surface Fixture, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	62	186	2,200	409	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	3	49	300	Ceiling	1	147	1,900	323	279	13	39	300	86	44	\$20
62	Second Floor	Quiet Room	1'x4' Surface Fixture, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	62	62	2,200	136	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	1	49	300	Ceiling	1	49	1,900	108	93	13	13	300	29	15	\$7
63	Second Floor	Classroom 114	1'x4' Surface Fixture with matte reflector, Prismatic Lens, w/ (4) F32T8/32w 800 Lamps & (1) Electronic Ballast	11	107	1,174	2,200	2,582	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	11	98	300	Ceiling	1	1,078	1,900	2,372	2,048	9	96	300	211	323	\$83
64	Second Floor	West Wing Stairwell	1'x4' Recessed Fixture with matte reflector, Prismatic Lens, w/ (4) F32T8/32w 800 Lamps & (1) Electronic Ballast	3	108	323	8,760	2,830	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	3	98	0	Ceiling	0	294	8,760	2,575	2,575	10	29	0	255	0	\$40
65	First Floor	Music Room	1'x4' Surface Fixture, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	25	62	1,550	2,200	3,410	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	25	49	300	Ceiling	1	1,225	1,900	2,695	2,328	13	325	300	715	368	\$168
66	First Floor	Office A	2'x2' Recessed Troffer, Prismatic Lens, w/ (2) FBO32T8/835, 32w 800 Lamps & (1) Electronic Ballast	2	62	124	2,200	273	New 2'x2' Recessed Troffer, silver reflectors, no Lens, w/ (2) F17T8,17w 800 Lamps & (1) Electronic Ballast	2	33	300	Wall	1	66	1,900	145	125	29	58	300	128	20	\$23
67	First Floor	Office B	60W incandescent	1	60	60	2,200	132	23W Screw in CFL	1	18	300	Wall	1	18	1,900	40	34	42	42	300	92	5	\$15
68	First Floor	Bathroom	60W incandescent	2	60	120	2,200	264	23W Screw in CFL	2	18	300	Ceiling	1	36	1,900	79	68	42	84	300	185	11	\$30

TOTAL SENSOR PLUS LABORNTOTAL SENSOR COSTIMENEND COSTIMENEND COSTIMENEND COSTIMENEND COSTIMENEND COSTIMENEND COSTIMENEND COSTIMENENDTOTAL SENSOR COSTIMENEND COSTIMENEND COSTIMENEND COSTIMENEND COSTIMENENDTOTAL SENSOR COSTIMENEND COSTIMENEND COSTIMENEND COSTIMENENDTOTAL SENSOR COSTICE COSTIMENEND COSTIMENEND COSTIMENENDTOTAL SENSOR COSTICE COSTIMENEND COSTIMENDTOTAL SENSOR COSTICE COSTIMENT COSTIMEND COSTIMENDTOTAL SENSOR COSTICE COSTIMENDSAGOS2500S1001S1000S1200S1200S1200S1000S1200S1200S1200S1000S1200S1000S1000S1000S1200S1000S1000S1000S1200S1200S1200S1000S1200S1200S1200S1000S1200S1200S1200S1000S3000S2500S1300S1200S1000S2500S1300S1200S1000S2500S1300S1200S1000S2500S1300S1200S1000S2500S1300S1200S1000S2500S1300S1200S1000S2500S1300S1200S1000S2500S1300S1200S1000S2500S1300S1200S1000S2500S1300S1200S1000S2500S1300S1200S1000S2500S1300S1200S1000S2500S1300S1200S1000S250<	COS		IS
No.         No.           \$600         \$250         \$265           \$600         \$250         \$715           \$495         \$250         \$620           \$960         \$250         \$1,015           \$360         \$120         \$400           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$200         \$230           \$120         \$200         \$100           \$15         \$250         \$230           \$150         \$250         \$140           \$1,000         \$1,460         \$460           \$200         \$120         \$140      \$200	COST (MATERIAL	COST (MATERIAL PLUS	INSTALLED COST AFTER
No.         No.           \$600         \$250         \$715           \$495         \$250         \$620           \$960         \$250         \$1,015           \$360         \$120         \$400           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$2120         \$120         \$230           \$120         \$250         \$230           \$150         \$250         \$230           \$120         \$100         \$1,460           \$1,200         \$750         \$765           \$360         \$500         \$260           \$200         \$120         \$460           \$200         \$120         \$460      \$200	\$360	\$250	\$515
No.         No.           \$495         \$250         \$620           \$960         \$250         \$1,015           \$360         \$120         \$400           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$2120         \$120         \$200           \$200         \$250         \$235           \$120         \$250         \$230           \$360         \$1,000         \$1,460           \$1,200         \$750         \$765           \$360         \$500         \$140           \$1,200         \$250         \$375           \$200         \$120         \$140           \$200         \$250         \$3460           \$200         \$120         \$140	\$60	\$250	\$265
Nome         Nome           \$960         \$250         \$1,015           \$360         \$120         \$400           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$2120         \$120         \$300           \$200         \$250         \$235           \$120         \$0         \$100           \$120         \$10         \$100           \$120         \$10         \$100           \$120         \$10         \$100           \$120         \$10         \$100           \$120         \$10         \$100           \$120         \$10         \$100           \$120         \$10         \$140           \$200         \$120         \$140           \$200         \$120         \$140           \$480	\$600	\$250	\$715
No.         No.           \$360         \$120         \$400           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$240         \$120         \$200           \$20         \$250         \$235           \$120         \$0         \$100           \$120         \$0         \$100           \$120         \$10         \$140           \$120         \$1,000         \$1,460           \$1,200         \$750         \$765           \$360         \$500         \$220           \$300         \$500         \$460           \$200         \$120         \$140           \$200         \$120         \$140           \$480         \$0         \$440           \$480         \$250         \$335           \$60	\$495	\$250	\$620
Nome         Nome           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$240         \$120         \$200           \$20         \$2250         \$235           \$120         \$0         \$100           \$15         \$250         \$230           \$15         \$250         \$230           \$15         \$250         \$230           \$150         \$250         \$230           \$150         \$250         \$230           \$360         \$1,000         \$1,460           \$1,200         \$765         \$765           \$300         \$500         \$460           \$200         \$120         \$140           \$480         \$0         \$440           \$480         \$250         \$335           \$150 </td <td>\$960</td> <td>\$250</td> <td>\$1,015</td>	\$960	\$250	\$1,015
\$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$120         \$120         \$200           \$2120         \$120         \$200           \$240         \$120         \$300           \$20         \$250         \$235           \$120         \$0         \$100           \$20         \$250         \$230           \$120         \$0         \$100           \$120         \$0         \$100           \$120         \$250         \$230           \$3,600         \$1,000         \$1,460           \$1,200         \$750         \$765           \$360         \$500         \$220           \$200         \$250         \$375           \$200         \$120         \$460           \$200         \$120         \$140           \$480         \$0         \$440           \$300         \$250         \$335           \$60         \$250         \$335 <t< td=""><td>\$360</td><td>\$120</td><td>\$400</td></t<>	\$360	\$120	\$400
Number of the second	\$120	\$120	\$200
\$120         \$120         \$200           \$120         \$120         \$200           \$240         \$120         \$300           \$20         \$250         \$235           \$120         \$0         \$100           \$20         \$250         \$235           \$120         \$0         \$100           \$120         \$0         \$100           \$120         \$0         \$100           \$15         \$250         \$230           \$360         \$1,000         \$1,460           \$1,200         \$750         \$765           \$360         \$500         \$520           \$300         \$500         \$460           \$200         \$250         \$375           \$200         \$120         \$140           \$200         \$120         \$140           \$480         \$0         \$440      \$480         \$0         \$440           \$300         \$250         \$335           \$60         \$250         \$335           \$60         \$250         \$335           \$50         \$250         \$265           \$150         \$250         \$335           \$660 <td>\$120</td> <td>\$120</td> <td>\$200</td>	\$120	\$120	\$200
Nome         Nome           \$120         \$120         \$200           \$240         \$120         \$300           \$20         \$250         \$235           \$120         \$0         \$100           \$120         \$0         \$100           \$120         \$0         \$100           \$120         \$0         \$100           \$120         \$0         \$100           \$15         \$250         \$230           \$15         \$250         \$230           \$15         \$250         \$230           \$15         \$250         \$230           \$150         \$1,000         \$1,460           \$1,200         \$750         \$765           \$360         \$500         \$460           \$200         \$250         \$375           \$200         \$120         \$260           \$200         \$120         \$140           \$480         \$0         \$440           \$300         \$250         \$335           \$150         \$250         \$335           \$60         \$250         \$335           \$60         \$250         \$255      \$660         \$250<	\$120	\$120	\$200
\$240         \$120         \$300           \$20         \$250         \$235           \$120         \$0         \$100           \$120         \$0         \$100           \$15         \$250         \$230           \$15         \$250         \$230           \$15         \$250         \$230           \$15         \$250         \$230           \$15         \$250         \$230           \$15         \$250         \$230           \$15         \$250         \$230           \$3,600         \$1,000         \$1,460           \$1,200         \$750         \$765           \$360         \$500         \$250           \$300         \$500         \$460           \$200         \$120         \$260           \$200         \$120         \$140           \$480         \$0         \$440           \$480         \$0         \$400           \$300         \$250         \$335           \$60         \$250         \$335           \$60         \$250         \$335           \$660         \$250         \$335           \$660         \$250         \$765      \$1	\$120	\$120	\$200
S20         S250         S235           \$120         \$0         \$100           \$15         \$250         \$230           \$15         \$250         \$230           \$3,600         \$1,000         \$1,460           \$1,200         \$750         \$765           \$360         \$500         \$520           \$360         \$500         \$520           \$300         \$500         \$460           \$200         \$250         \$375           \$200         \$120         \$260           \$200         \$120         \$140           \$480         \$0         \$440           \$480         \$0         \$440           \$480         \$250         \$335           \$150         \$250         \$335           \$60         \$250         \$335           \$60         \$250         \$335           \$50         \$250         \$255           \$660         \$250         \$255           \$660         \$250         \$765           \$180         \$0         \$150           \$180         \$0         \$150	\$120	\$120	\$200
\$120         \$0         \$100           \$15         \$250         \$230           \$3,600         \$1,000         \$1,460           \$1,200         \$750         \$765           \$360         \$500         \$520           \$300         \$500         \$520           \$300         \$500         \$460           \$200         \$250         \$375           \$200         \$120         \$260           \$50         \$120         \$140           \$480         \$0         \$440           \$480         \$0         \$440           \$480         \$250         \$335           \$150         \$250         \$335           \$60         \$250         \$335           \$60         \$250         \$265           \$150         \$250         \$335           \$60         \$250         \$265           \$150         \$250         \$255           \$660         \$250         \$255           \$660         \$250         \$765           \$180         \$0         \$150           \$180         \$0         \$150           \$1,250         \$255         \$1,215 <td>\$240</td> <td>\$120</td> <td>\$300</td>	\$240	\$120	\$300
%15         %250         %230           \$\$1,000         \$\$1,460           \$\$1,200         \$750         \$765           \$360         \$500         \$520           \$360         \$500         \$520           \$360         \$500         \$460           \$200         \$250         \$375           \$200         \$120         \$260           \$50         \$120         \$140           \$480         \$0         \$400           \$480         \$0         \$440           \$480         \$0         \$455           \$150         \$250         \$335           \$60         \$250         \$335           \$60         \$250         \$335           \$50         \$250         \$335           \$60         \$250         \$355           \$150         \$250         \$355           \$150         \$250         \$255           \$660         \$250         \$765           \$180         \$0         \$150           \$120         \$250         \$150	\$20	\$250	\$235
\$3,600         \$1,000         \$1,460           \$1,200         \$750         \$765           \$360         \$500         \$520           \$360         \$500         \$460           \$300         \$500         \$460           \$200         \$250         \$375           \$200         \$120         \$260           \$50         \$120         \$400           \$480         \$0         \$400           \$480         \$0         \$400           \$480         \$250         \$335           \$150         \$250         \$335           \$60         \$250         \$335           \$60         \$250         \$335           \$50         \$250         \$335           \$60         \$250         \$335           \$60         \$250         \$335           \$150         \$250         \$335           \$150         \$250         \$125           \$660         \$250         \$765           \$180         \$0         \$150           \$120         \$250         \$1,215	\$120	\$0	\$100
\$1,200         \$750         \$765           \$360         \$500         \$520           \$300         \$500         \$460           \$200         \$250         \$375           \$200         \$250         \$375           \$200         \$120         \$260           \$50         \$120         \$140           \$480         \$0         \$400           \$300         \$250         \$335           \$60         \$250         \$335           \$60         \$250         \$335           \$60         \$250         \$265           \$150         \$250         \$335           \$60         \$250         \$335           \$150         \$250         \$335           \$150         \$250         \$265           \$150         \$250         \$335           \$50         \$250         \$365           \$180         \$0         \$150           \$180         \$0         \$150           \$1,250         \$250         \$1,215	\$15	\$250	\$230
\$360         \$500         \$520           \$300         \$500         \$460           \$200         \$250         \$375           \$200         \$120         \$260           \$50         \$120         \$260           \$50         \$120         \$140           \$480         \$0         \$440           \$300         \$250         \$140           \$480         \$0         \$440           \$300         \$250         \$455           \$150         \$250         \$335           \$60         \$250         \$265           \$150         \$250         \$335           \$60         \$250         \$255           \$150         \$250         \$255           \$660         \$250         \$765           \$180         \$0         \$150           \$120         \$250         \$1,215	\$3,600	\$1,000	\$1,460
%300         %500         %460           \$200         \$250         \$375           \$200         \$120         \$260           \$50         \$120         \$140           \$50         \$120         \$140           \$480         \$0         \$400           \$480         \$0         \$400           \$300         \$250         \$455           \$150         \$250         \$335           \$60         \$250         \$335           \$50         \$250         \$335           \$660         \$250         \$355           \$660         \$250         \$765           \$180         \$0         \$150           \$1,250         \$250         \$1,215	\$1,200	\$750	\$765
\$200         \$250         \$375           \$200         \$120         \$260           \$50         \$120         \$140           \$480         \$0         \$400           \$300         \$250         \$455           \$150         \$250         \$335           \$60         \$250         \$335           \$60         \$250         \$335           \$150         \$250         \$335           \$60         \$250         \$335           \$150         \$250         \$335           \$150         \$250         \$355           \$150         \$250         \$150           \$150         \$250         \$150           \$180         \$0         \$150           \$1,250         \$250         \$1,215	\$360	\$500	\$520
\$200         \$120         \$260           \$50         \$120         \$140           \$480         \$0         \$400           \$300         \$250         \$455           \$150         \$250         \$335           \$60         \$250         \$335           \$50         \$250         \$335           \$60         \$250         \$265           \$150         \$250         \$335           \$60         \$250         \$365           \$150         \$250         \$365           \$150         \$250         \$150           \$180         \$0         \$150           \$1,250         \$250         \$1,215	\$300	\$500	\$460
\$50         \$120         \$140           \$480         \$0         \$400           \$300         \$250         \$455           \$150         \$250         \$335           \$60         \$250         \$265           \$150         \$250         \$265           \$150         \$250         \$255           \$60         \$250         \$255           \$150         \$250         \$255           \$660         \$250         \$765           \$180         \$0         \$150           \$1,250         \$250         \$1,215	\$200	\$250	\$375
\$480         \$0         \$400           \$300         \$250         \$455           \$150         \$250         \$335           \$60         \$250         \$265           \$150         \$250         \$265           \$150         \$250         \$335           \$60         \$250         \$265           \$150         \$250         \$335           \$50         \$250         \$255           \$660         \$250         \$765           \$180         \$0         \$150           \$1,250         \$250         \$1,215	\$200	\$120	\$260
\$300         \$250         \$455           \$150         \$250         \$335           \$60         \$250         \$265           \$150         \$250         \$335           \$60         \$250         \$265           \$150         \$250         \$335           \$50         \$250         \$355           \$660         \$250         \$255           \$660         \$250         \$765           \$180         \$0         \$150           \$1,250         \$250         \$1,215	\$50	\$120	\$140
%         %	\$480	\$0	\$400
\$60         \$250         \$265           \$150         \$250         \$335           \$50         \$250         \$255           \$660         \$250         \$765           \$180         \$0         \$150           \$1,250         \$250         \$1,215	\$300	\$250	\$455
\$150         \$250         \$335           \$50         \$250         \$255           \$660         \$250         \$765           \$180         \$0         \$150           \$1,250         \$250         \$1,215	\$150	\$250	\$335
\$50         \$250         \$255           \$660         \$250         \$765           \$180         \$0         \$150           \$1,250         \$250         \$1,215	\$60	\$250	\$265
\$660         \$250         \$765           \$180         \$0         \$150           \$1,250         \$250         \$1,215	\$150	\$250	\$335
\$180         \$0         \$150           \$1,250         \$250         \$1,215	\$50	\$250	\$255
\$1,250 \$250 \$1,215	\$660	\$250	\$765
	\$180	\$0	\$150
\$100 \$120 \$180	\$1,250	\$250	\$1,215
	\$100	\$120	\$180
\$5 \$120 \$105	\$5	\$120	\$105
\$10 \$250 \$225	\$10	\$250	\$225

Dor	Pine-Tech, Inc.		LIGHTING UPGRADE PROJECT LINE x LINE DETAIL		ISTOM CILITY				Dunellen Public Schools High School			FAC	ILITY S 77,794	Q. FT.			TE OF A 12/31/20	-						
		DESCRIPTION								REF	PLACEN	IENT FL	TURES								ENERG	Y ANAL	YSIS	
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS 910	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS 910	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	total annual \$ savings / line (including sensors) \$0.155
69	First Floor	Office C	1'x4' Surface Fixture, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	62	62	2,200	136	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	1	49	300	Wall	1	49	1,900	108	93	13	13	300	29	15	\$7
70	First Floor	Custodian	60W incandescent	1	60	60	500	30	23W Screw in CFL	1	18	0	Ceiling	0	18	500	9	9	42	42	0	21	0	\$3
71	First Floor	Faculty Room	2'x4' Surface Fixture, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	9	107	960	2,200	2,113	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	9	98	300	Ceiling	1	882	1,900	1,940	1,676	9	78	300	172	265	\$68
72	First Floor	Bathroom	Recessed round fixture w/ prismatic lens w/ (2) 14W Compact Fluorescent Lamp (CFL)	2	28	56	2,200	123	None	2	28	300	Ceiling	1	56	1,900	123	106	0	0	300	0	17	\$3
73	First Floor	Kitchen	1'x4' Surface Fixture, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	20	62	1,240	2,200	2,728	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	20	49	0	Ceiling	0	980	2,200	2,156	2,156	13	260	0	572	0	\$89
74	First Floor	Kitchen Office	1'x4' Surface Mount, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	1	144	144	2,200	317	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	1	98	300	Wall	1	98	1,900	216	186	46	46	300	101	29	\$20
75	First Floor	Bathroom	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	107	107	2,200	235	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	1	98	300	Ceiling	1	98	1,900	216	186	9	9	300	19	29	\$8
76	First Floor	Storage	1'x4' Surface Fixture, No Lens, w/ (2) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	1	66	66	500	33	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	1	49	0	Ceiling	0	49	500	25	25	17	17	0	9	0	\$1
77	First Floor	Cafeteria	2'x4' Surface Mount, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Magnetic Ballast	24	144	3,456	2,200	7,603	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	24	98	300	Ceiling	2	2,352	1,900	5,174	4,469	46	1,104	300	2,429	706	\$487
78	First Floor	Kitchen	60W incandescent	4	60	240	2,200	528	23W Screw in CFL	4	18	0	Ceiling	0	72	2,200	158	158	42	168	0	370	0	\$57
79	First Floor	Auditorium	9 Watt Compact Fluorescent	34	9	306	500	153	None	34	9	0	Ceiling	0	306	500	153	153	0	0	0	0	0	\$0
80	First Floor	Stage	60W incandescent	2	60	120	500	60	23W Screw in CFL	2	18	0	Ceiling	0	36	500	18	18	42	84	0	42	0	\$7
81	First Floor	Stage	4' Pandant Fixture, No Lens, w/ (2) F40T12/34w Lamp & (1) Energy Saving Magnetic Ballast	8	75	600	500	300	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	8	49	0	Ceiling	0	392	500	196	196	26	208	0	104	0	\$16
82	First Floor	Auditorium Entry	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	11	62	682	500	341	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	11	49	0	Ceiling	0	539	500	270	270	13	143	0	72	0	\$11
83	First Floor	Stairwell Library	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	107	320	8,760	2,804	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	3	98	0	Ceiling	0	294	8,760	2,575	2,575	9	26	0	229	0	\$36
84	First Floor	Classroom 5	2'x4' Surface Fixture, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	12	62	744	2,200	1,637	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	12	49	300	Ceiling	1	588	1,900	1,294	1,117	13	156	300	343	176	\$81
85	First Floor	Woodshop Room 5	1'x4' Surface Fixture, No Lens, w/ (2) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	58	66	3,828	2,200	8,422	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	58	49	0	Ceiling	0	2,842	2,200	6,252	6,252	17	986	0	2,169	0	\$337
86	First Floor	Classroom 4	2'x4' Surface Fixture, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	12	62	744	2,200	1,637	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	12	49	300	Ceiling	1	588	1,900	1,294	1,117	13	156	300	343	176	\$81
87	First Floor	Stairwell	1'x4' Pandant Fixture, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	62	248	8,760	2,172	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	4	49	0	Ceiling	0	196	8,760	1,717	1,717	13	52	0	456	0	\$71
88	First Floor	Guidance Office	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	8	107	854	2,200	1,878	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	8	98	300	Wall	1	784	1,900	1,725	1,490	9	70	300	153	235	\$60
89	First Floor	Office 1	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	107	213	2,200	469	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	2	98	300	Wall	1	196	1,900	431	372	9	17	300	38	59	\$15
90	First Floor	Office 2	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	107	213	2,200	469	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	2	98	300	Wall	1	196	1,900	431	372	9	17	300	38	59	\$15
91	First Floor	Office 3	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	107	213	2,200	469	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	2	98	300	Wall	1	196	1,900	431	372	9	17	300	38	59	\$15
92	First Floor	Office 4	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	107	107	2,200	235	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	1	98	300	Wall	1	98	1,900	216	186	9	9	300	19	29	\$8
93	First Floor	Vice Principle Sec.	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	107	320	2,200	704	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	3	98	300	Wall	1	294	1,900	647	559	9	26	300	57	88	\$23
94	First Floor	Main Entrance	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	62	372	5,000	1,860	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	6	49	300	Ceiling	1	294	4,700	1,470	1,382	13	78	300	390	88	\$74
95	First Floor	Vice Principle	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	62	186	2,200	409	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	3	49	300	Wall	1	147	1,900	323	279	13	39	300	86	44	\$20
96	First Floor	Room	60W incandescent	3	60	180	2,200	396	23W Screw in CFL	3	18	300	Wall	1	54	1,900	119	103	42	126	300	277	16	\$46
97	First Floor	Main Office	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	8	62	496	2,200	1,091	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	8	49	300	Wall	1	392	1,900	862	745	13	104	300	229	118	\$54
98	First Floor	Principal	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	62	186	2,200	409	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	3	49	300	Wall	1	147	1,900	323	279	13	39	300	86	44	\$20
99	First Floor	Bathroom	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	62	62	2,200	136	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	1	49	300	Ceiling	1	49	1,900	108	93	13	13	300	29	15	\$7
100	First Floor	Conference	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	62	124	2,200	273	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	2	49	300	Ceiling	1	98	1,900	216	186	13	26	300	57	29	\$13
101	First Floor	Storage	60W incandescent	2	60	120	500	60	23W Screw in CFL	2	18	0	Ceiling	0	36	500	18	18	42	84	0	42	0	\$7
102	First Floor	Girls Room	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	62	248	2,200	546	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	4	49	300	Ceiling	1	196	1,900	431	372	13	52	300	114	59	\$27

COS		IS
TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
\$50	\$120	\$140
\$5	\$0	\$5
\$540	\$250	\$665
\$0	\$250	\$215
\$1,000	\$0	\$800
\$60	\$120	\$150
\$60	\$250	\$265
\$50	\$0	\$40
\$1,440	\$500	\$1,420
\$20	\$0	\$20
\$0	\$0	\$0
\$10	\$0	\$10
\$480	\$0	\$400
\$550	\$0	\$440
\$180	\$0	\$150
\$600	\$250	\$695
\$2,900	\$0	\$2,320
\$600	\$250	\$695
\$220	\$0	\$180
\$480	\$120	\$500
\$120	\$120	\$200
\$120	\$120	\$200
\$120	\$120	\$200
\$60	\$120	\$150
\$180	\$120	\$250
\$300	\$250	\$455
\$150	\$120	\$220
\$15	\$120	\$115
\$400	\$120	\$420
\$150	\$120	\$220
\$50	\$250	\$255
\$100	\$250	\$295
\$10	\$0	\$10
\$200	\$250	\$375

			LIGHTING UPGRADE PROJECT	CU	STOM	ER:			Dunellen Public Schools			FAC	ILITY S	Q. FT.		DAT	E OF A	UDIT:	1								
Dor	ne-Tech, Inc.		LINE X LINE DETAIL	FA	CILITY	<b>':</b>			High School				77,794			1	2/31/20	13									
		DESCRIPTION								REF	LACEN	IENT FI	TURES								ENERG	Y ANAL	YSIS		COS		IS
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS 910	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS 910	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS) \$0.155	TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
103	First Floor	Closet	4ft Wall Mounted , Prismatic Lens, w/ (2) F32T8/32w Lamps & (1) Electronic Ballast	1	68	68	500	34	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	1	49	0	Ceiling	0	49	500	25	25	19	19	0	10	0	\$1	\$50	\$0	\$40
104	First Floor	Girls Locker Room Entry	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pandant, No Lens	1	68	68	2,200	150	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	1	49	300	Ceiling	1	49	1,900	108	93	19	19	300	42	15	\$9	\$50	\$250	\$255
105	First Floor	Girls Locker Room	8' Pandant Mount, No Lens, w/ (2) F96T12/75w Lamps & (1) Magnetic Ballast	2	142	283	2,200	623	New 8-ft Strip fixture w /(4) 4ft F28T8 Lamps & (1) Elec. Low- Power High Efficiency Ballast	2	98	300	Ceiling	1	196	1,900	431	372	44	87	300	191	59	\$39	\$200	\$250	\$395
106	First Floor	Girls Locker Room	60W incandescent	2	60	120	2,200	264	23W Screw in CFL	2	18	300	Ceiling	1	36	1,900	79	68	42	84	300	185	11	\$30	\$10	\$250	\$225
107	First Floor	Girls Locker Room	4' Fluorescent Strip with (1) F32T8 & (1) Electronic Ballast, Wall Mounted, No Lens	2	35	70	2,200	154	Relamp & Reballast w/ (1) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	2	25	300	Ceiling	1	50	1,900	110	95	10	20	300	44	15	\$9	\$90	\$250	\$285
108	First Floor	Hallway	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	5,000	860	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	2	72	0	Ceiling	0	144	5,000	720	720	14	28	0	140	0	\$22	\$110	\$0	\$90
109	First Floor	Room 1	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	8	86	690	2,200	1,517	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	8	72	300	Wall	1	576	1,900	1,267	1,094	14	114	300	250	173	\$66	\$440	\$120	\$460
110	First Floor	Room 2	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	12	107	1,280	2,200	2,817	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	12	98	300	Wall	1	1,176	1,900	2,587	2,234	9	104	300	230	353	\$91	\$720	\$120	\$700
111	First Floor	Boys Room	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	107	320	2,200	704	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	3	98	300	Ceiling	1	294	1,900	647	559	9	26	300	57	88	\$23	\$180	\$250	\$365
112	First Floor	Room	2'x4' Pandant, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	107	213	2,200	469	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	2	98	300	Wall	1	196	1,900	431	372	9	17	300	38	59	\$15	\$120	\$120	\$200
113	First Floor	Boiler Room	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pandant, No Lens	11	68	750	8,760	6,572	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	11	49	0	Ceiling	0	539	8,760	4,722	4,722	19	211	0	1,850	0	\$287	\$550	\$0	\$440
114	First Floor	Boiler Room	60W incandescent	2	60	120	8,760	1,051	23W Screw in CFL	2	18	0	Ceiling	0	36	8,760	315	315	42	84	0	736	0	\$114	\$10	\$0	\$10
115	First Floor	Nurse Entry	2'x2' Recessed Troffer, Prismatic Lens, w/ (2) FBO32T8/835, 32w 800 Lamps & (1) Electronic Ballast	2	62	124	2,200	273	New 2'x2' Recessed Troffer, silver reflectors, no Lens, w/ (2) F17T8,17w 800 Lamps & (1) Electronic Ballast	2	33	300	Ceiling	1	66	1,900	145	125	29	58	300	128	20	\$23	\$100	\$250	\$295
116	First Floor	Nurse Office	1'x4' Surface Fixture, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	62	372	2,200	818	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	6	49	300	Wall	1	294	1,900	647	559	13	78	300	172	88	\$40	\$300	\$120	\$340
117	First Floor	Patient Room	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	107	107	2,200	235	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	1	98	300	Wall	1	98	1,900	216	186	9	9	300	19	29	\$8	\$60	\$120	\$150
118	First Floor	Bathroom	60W incandescent	3	60	180	2,200	396	23W Screw in CFL	3	18	300	Ceiling	1	54	1,900	119	103	42	126	300	277	16	\$46	\$15	\$250	\$230
119	First Floor	Hallway	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	62	372	5,000	1,860	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	6	49	0	Ceiling	0	294	5,000	1,470	1,470	13	78	0	390	0	\$61	\$300	\$0	\$240
120	First Floor	Chemistry Hallway	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	62	248	5,000	1,240	Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	4	49	0	Ceiling	0	196	5,000	980	980	13	52	0	260	0	\$40	\$200	\$0	\$160
121	First Floor	Classroom 7 Chemistry	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	20	86	1,720	2,200	3,784	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/28 Elec. Low- Power High Efficiency Ballast	20	72	300	Ceiling	2	1,440	1,900	3,168	2,736	14	280	300	616	432	\$163	\$1,100	\$500	\$1,120
122	First Floor	Classroom 8 General Science	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	8	107	854	2,200	1,878	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	8	98	300	Ceiling	2	784	1,900	1,725	1,490	9	70	300	153	235	\$60	\$480	\$500	\$620
123	First Floor	Classroom 9	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	9	107	960	2,200	2,113	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	9	98	300	Ceiling	2	882	1,900	1,940	1,676	9	78	300	172	265	\$68	\$540	\$500	\$670
124	First Floor	Classroom 7 Chemistry	1'x4' Pandant strip, No Lens, w/ (2) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast							4	49	300	Ceiling	2	196	1,900	431	372	17	68	300	150	59	\$32	\$200	\$500	\$380
125	25 First Floor Classroom 8 General Science 1 <sup>1</sup> x <sup>4</sup> ' Surface Fixture, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast 4 62 248 2,200 546 Relamp & Reballast w/ (2) F28T8 Lamps & (1) High Efficiency Ballast							Relamp & Reballast w/ (2) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	4	49	300	Ceiling	2	196	1,900	431	372	13	52	300	114	59	\$27	\$200	\$500	\$380	
126	First Floor	Classroom 9	60W incandescent	2	60	120	2,200	264	23W Screw in CFL	2	18	0	Ceiling	0	36	2,200	79	79	42	84	0	185	0	\$29	\$10	\$0	\$10
127	First Floor	Hallway	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	107	640	5,000	3,201	Relamp & Reballast w/ (4) F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	6	98	0	Ceiling	0	588	5,000	2,940	2,940	9	52	0	261	0	\$41	\$360	\$0	\$300
127	-	Exterior	150 W Metal Halide Wall Pack	12	185	2,220	3,650	8,103	45 Watt LED Wall Mount	12	45	0	Ceiling	0	540	3,650	1,971	1,971	140	1,680	0	6,132	0	\$953	\$4,800	\$0	\$3,600
128	-	Exterior	Wall Mounted Shoebox - 100W incandescent	18	100	1,800	3,650	6,570	40 Watt LED Wall Mount	18	40	0	Ceiling	0	720	3,650	2,628	2,628	60	1,080	0	3,942	0	\$613	\$4,230	\$0	\$2,430
129	- Exterior Light Poles - 400W HID (Utility Owned) 4 460 1,840 3,650 6,716 None									4	460	0	Ceiling	0	1,840	3,650	6,716	6,716	0	0	0	0	0	\$0	\$0	\$0	\$0
	9         -         Exterior         Light Poles - 400W HID (Utility Owned)         4         460         1,840         3,650         6,716         None													109	60,482		149,634	135,779				46,951	13,855	9,448 0	58,400	23,090	58,745



510 Thornall Street, Suite 170 Edison, NJ 08837 Tel: 732.590.0122 Fax: 732.590.0129

ECM #4:

### LIGHTING EQUIPMENT UPGRADE – LED



### LIGHTING RETROFIT SUMMARY FOR: John P. Faber School High&Lehigh Streets, Dunellen, NJ 08812

BUILDING INFORM	ATION		EXISTING	<b>G FIXTURE</b>	S	Р	ROPOS	ED FIXTUR	ES			S	AVINGS							FINANC	IAL		
BUILDING	SQ. FT.	PRE TOTAL FIXT. QTY	PRE TOTAL FIXT. WATTS	PRE ANNUAL KWH CONSUMPTION	PRE WATTS / SQ. FT	POST TOTAL FIXT. QTY	POST TOTAL FIXT. WATTS	POST ANNUAL KWH CONSUMPTION	POST WATTS / SQ. FT	WATTS SAVED	ANNUAL KWH SAVED WITH FIXTURES	ANNUAL KWH SAVED WITH SENSORS	TOTAL ANNUAL KWH SAVED	SAVINGS \$	ANNUAL SAVINGS \$ SENSORS	\$	CO2 REDUCTION (TONS)	FIATURE	NJ Smart Start SENSOR REBATE \$	FIXTURES TOTAL (INSTALLED) COST \$	SENSORS TOTAL (INSTALLED) COST \$	MATERIAL TOTAL (INSTALLED) COST \$	SIMPLE PAYBACK AFTER REBATE (YEARS)
John P. Faber School	89,203	996	107,390	254,685	1.20	996	63,543	151,418	0.71	43,847	103,267	17,607	120,874	\$16,292	\$2,778	\$19,070	34.1	\$30,260	\$3,930	\$126,815	\$27,820	\$154,635	6.3

3%	PERCENTAGE OF REBATES IN TOTAL INSTALLED COST
59%	PERCENTAGE OF CONSUMPTION COMPARE TO EXISTING STATE
42%	EXISTING PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING
25%	PROPOSED PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING

Dome	-Tech, Inc.		LIGHTING UPGRADE PROJECT LINE x LINE DETAIL		JSTOM CILITY				Dunellen Public Schools John P. Faber School			FAC	CILITY S 89,20				TE OF A 12/12/20	-						
	SPACE	DESCRIPTION								REF	PLACE	MENT F	IXTURE	6							ENERG	Y ANAL	YSIS	
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS 910	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS 910	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS) \$0.158
1	2	3	4 4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast,	5	6	7	8	9	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1	First Floor	Classroom 41	Surface Mount, Prismatic Lens	16	68	1,091	2,200	2,401	Retrofit fixture with (2) LED Tubes	16	40	300	Ceiling	1	640	1,900	1,408	1,216	28	451	300	993	192	\$187
2	First Floor	Classroom 42	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Surface Mount, Prismatic Lens	18	68	1,228	2,200	2,701	Retrofit fixture with (2) LED Tubes	18	40	300	Ceiling	1	720	1,900	1,584	1,368	28	508	300	1,117	216	\$210
3	First Floor	Bathroom	2'x4' Surface Fixture, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	62	62	2,200	136	Retrofit fixture with (2) LED Tubes	1	40	300	Ceiling	1	40	1,900	88	76	22	22	300	48	12	\$10
4	First Floor	Classroom 40	1'x4' Surface Mount, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	12	144	1,728	2,200	3,802	Retrofit fixture with (4) LED Tubes	12	80	300	Ceiling	1	960	1,900	2,112	1,824	64	768	300	1,690	288	\$312
5	First Floor	All Purpose Room	400W Metal Halide Fixtures (Pandant)	16	460	7,360	2,200	16,192	4 Lamp F54T5HO/ (54W) High Bay Fixture with Wireguard	16	236	300	Ceiling	1	3,776	1,900	8,307	7,174	224	3,584	300	7,885	1,133	\$1,423
6	First Floor	All Purpose Room - Stage	300W Pandand Incandescent Fixtures	4	300	1,200	2,200	2,640	New 100W LED Fixture	4	100	300	Ceiling	1	400	1,900	880	760	200	800	300	1,760	120	\$297
7	First Floor	Kitchen	2'x4' Surface Fixture, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	10	62	620	2,200	1,364	Retrofit fixture with (2) LED Tubes	10	40	0	Ceiling	0	400	2,200	880	880	22	220	0	484	0	\$76
8	First Floor	Kitchen Hood	60W incandescent	5	60	300	500	150	18W CFL	5	18	0	Ceiling	0	90	500	45	45	42	210	0	105	0	\$17
9	First Floor	Food Storage Room 1	2'x4' Surface Fixture, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	62	186	500	93	Retrofit fixture with (2) LED Tubes	3	40	0	Ceiling	0	120	500	60	60	22	66	0	33	0	\$5
10	First Floor	Food Storage Room 2	2'x4' Surface Fixture, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	62	124	500	62	Retrofit fixture with (2) LED Tubes	2	40	0	Ceiling	0	80	500	40	40	22	44	0	22	0	\$3
11	First Floor	Kitchen Office	2'x4' Surface Fixture, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	62	124	2,200	273	Retrofit fixture with (2) LED Tubes	2	40	300	Wall	1	80	1,900	176	152	22	44	300	97	24	\$19
12	First Floor	Bathroom	1'x4' Pandant Fixture, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	62	124	2,200	273	Retrofit fixture with (2) LED Tubes	2	40	300	Ceiling	1	80	1,900	176	152	22	44	300	97	24	\$19
13	First Floor	Bathroom	2'x4' Surface Fixture, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	62	62	2,200	136	Retrofit fixture with (2) LED Tubes	1	40	300	Ceiling	1	40	1,900	88	76	22	22	300	48	12	\$10
14	First Floor	Back hallway	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	62	248	5,000	1,240	Retrofit fixture with (2) LED Tubes	4	40	0	Ceiling	0	160	5,000	800	800	22	88	0	440	0	\$69
15	First Floor	Diswashing Room	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	62	124	2,200	273	Retrofit fixture with (2) LED Tubes	2	40	300	Ceiling	1	80	1,900	176	152	22	44	300	97	24	\$19
16	First Floor	Storage Room	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	62	124	500	62	Retrofit fixture with (2) LED Tubes	2	40	0	Ceiling	0	80	500	40	40	22	44	0	22	0	\$3
17	First Floor	Classroom 1	1'x4' Surface Fixture, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	9	62	558	2,200	1,228	Retrofit fixture with (2) LED Tubes	9	40	300	Ceiling	1	360	1,900	792	684	22	198	300	436	108	\$86
18	First Floor	Girls Bathroom	1'x4' Surface Fixture, Prismatic Lens, w/ (2) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	2	66	132	2,200	290	Retrofit fixture with (2) LED Tubes	2	40	300	Ceiling	1	80	1,900	176	152	26	52	300	114	24	\$22
19	First Floor	Storage Room	1'x4' Surface Mount, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	1	144	144	2,200	317	Retrofit fixture with (4) LED Tubes	1	80	0	Ceiling	0	80	2,200	176	176	64	64	0	141	0	\$22
20	First Floor	Boys Bathroom	1'x4' Surface Fixture, Prismatic Lens, w/ (2) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	2	66	132	2,200	290	Retrofit fixture with (2) LED Tubes	2	40	300	Ceiling	1	80	1,900	176	152	26	52	300	114	24	\$22
21	First Floor	Classroom 2	1'x4' Surface Mount, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	4	144	576	2,200	1,267	Retrofit fixture with (4) LED Tubes	4	80	300	Ceiling	1	320	1,900	704	608	64	256	300	563	96	\$104
22	First Floor	Classroom 3A	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	5	62	310	2,200	682	Retrofit fixture with (2) LED Tubes	5	40	300	Ceiling	1	200	1,900	440	380	22	110	300	242	60	\$48
23	First Floor	Main Office Vestibule	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	62	124	5,000	620	Retrofit fixture with (2) LED Tubes	2	40	0	Wall	0	80	5,000	400	400	22	44	0	220	0	\$35
24	First Floor	Classroom 28	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	86	517	2,200	1,138	Retrofit fixture with (3) LED Tubes	6	60	300	Ceiling	1	360	1,900	792	684	26	157	300	346	108	\$72
25	First Floor	Classroom 29	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	86	517	2,200	1,138	Retrofit fixture with (3) LED Tubes	6	60	300	Ceiling	1	360	1,900	792	684	26	157	300	346	108	\$72
26	First Floor	Classroom 30	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	12	86	1,032	2,200	2,270	Retrofit fixture with (3) LED Tubes	12	60	300	Ceiling	1	720	1,900	1,584	1,368	26	312	300	686	216	\$142
27	First Floor	Closet	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Surface Mount, Prismatic Lens	1	68	68	500	34	Retrofit fixture with (2) LED Tubes	1	40	0	Ceiling	0	40	500	20	20	28	28	0	14	0	\$2
28	First Floor	Storage Near 30	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Surface Mount, Prismatic Lens	2	68	136	500	68	Retrofit fixture with (2) LED Tubes	2	40	0	Ceiling	0	80	500	40	40	28	56	0	28	0	\$4
29	First Floor	WorkRoom	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	344	2,200	757	Retrofit fixture with (3) LED Tubes	4	60	300	Ceiling	1	240	1,900	528	456	26	104	300	229	72	\$47
30	First Floor	Storage	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Surface Mount, Prismatic Lens	1	68	68	500	34	Retrofit fixture with (2) LED Tubes	1	40	0	Ceiling	0	40	500	20	20	28	28	0	14	0	\$2
31	First Floor	Classroom 31	1'x4' Surface Mount, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	12	144	1,728	2,200	3,802	Retrofit fixture with (4) LED Tubes	12	80	300	Ceiling	1	960	1,900	2,112	1,824	64	768	300	1,690	288	\$312
32	First Floor	Classroom 32	1'x4' Surface Mount, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	12	144	1,728	2,200	3,802	Retrofit fixture with (4) LED Tubes	12	80	300	Ceiling	1	960	1,900	2,112	1,824	64	768	300	1,690	288	\$312
33	First Floor	Classroom 33	1'x4' Surface Mount, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	20	144	2,880	2,200	6,336	Retrofit fixture with (4) LED Tubes	20	80	300	Ceiling	1	1,600	1,900	3,520	3,040	64	1,280	300	2,816	480	\$520
34	First Floor	Classroom 34	1'x4' Surface Mount, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	16	144	2,304	2,200	5,069	Retrofit fixture with (4) LED Tubes	16	80	300	Ceiling	1	1,280	1,900	2,816	2,432	64	1,024	300	2,253	384	\$416

COS		S
TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
27	28 #250	29
\$1,440	\$250	\$1,335
\$1,620	\$250	\$1,475
\$90	\$250	\$285
\$1,800	\$250	\$1,535
\$6,400	\$250	\$5,015
\$1,600	\$250	\$1,415
\$900	\$0	\$700
\$25	\$0	\$25
\$270	\$0	\$210
\$180	\$0	\$140
\$180	\$120	\$240
\$180	\$250	\$355
\$90	\$250	\$285
\$360	\$0	\$280
\$180	\$250	\$355
\$180	\$0	\$140
\$810	\$250	\$845
\$180	\$250	\$355
\$150	\$0	\$110
\$180	\$250	\$355
\$600	\$250	\$655
\$450	\$250	\$565
\$180	\$0	\$140
\$720	\$250	\$755
\$720	\$250	\$755
\$1,440	\$250	\$1,295
\$90	\$0	\$70
\$180	\$0	\$140
\$480	\$250	\$575
\$90	\$0	\$70
\$1,800	\$250	\$1,535
\$1,800	\$250	\$1,535
\$3,000	\$250	\$2,415
\$2,400	\$250	\$1,975

Dom	Parech, Inc.		LIGHTING UPGRADE PROJECT LINE x LINE DETAIL		JSTOM ACILITY				Dunellen Public Schools John P. Faber School	FACILITY SQ. FT. D 89,203								JDIT: 13									
	SPACE	DESCRIPTION								REP	LACE	MENT F	IXTURE	S							ENERG	Y ANAL	YSIS		COS		S
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	default annual hours 910	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS 910	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS) \$0.158	TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
35	First Floor	Boiler Room	60W incandescent	3	60	180	2,200	396	18W CFL	3	18	0	Ceiling	0	54	2,200	119	119	42	126	0	277	0	\$44	\$15	\$0	\$15
36	First Floor	Boys Bathroom	60W incandescent	1	60	60	2,200	132	18W CFL	1	18	300	Ceiling	1	18	1,900	40	34	42	42	300	92	5	\$15	\$5	\$250	\$220
37	First Floor	Boys Bathroom	1'x4' Surface Mount, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	2	144	288	2,200	634	Retrofit fixture with (4) LED Tubes	2	80	300	Ceiling	1	160	1,900	352	304	64	128	300	282	48	\$52	\$300	\$250	\$435
38	First Floor	Custodian Room	1'x4' Surface Mount, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	1	144	144	500	72	Retrofit fixture with (4) LED Tubes	1	80	0	Ceiling	0	80	500	40	40	64	64	0	32	0	\$5	\$150	\$0	\$110
39	First Floor	Maintanence Room	1'x4' Surface Mount, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	3	144	432	500	216	Retrofit fixture with (4) LED Tubes	3	80	0	Ceiling	0	240	500	120	120	64	192	0	96	0	\$15	\$450	\$0	\$330
40	First Floor	Classroom 35	1'x4' Surface Mount, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	12	144	1,728	2,200	3,802	Retrofit fixture with (4) LED Tubes	12	80	300	Ceiling	1	960	1,900	2,112	1,824	64	768	300	1,690	288	\$312	\$1,800	\$250	\$1,535
41	First Floor	Classroom 36	1'x4' Surface Mount, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	12	144	1,728	2,200	3,802	Retrofit fixture with (4) LED Tubes	12	80	300	Ceiling	1	960	1,900	2,112	1,824	64	768	300	1,690	288	\$312	\$1,800	\$250	\$1,535
42	First Floor	Classroom 37	1'x4' Surface Mount, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	12	144	1,728	2,200	3,802	Retrofit fixture with (4) LED Tubes	12	80	300	Ceiling	1	960	1,900	2,112	1,824	64	768	300	1,690	288	\$312	\$1,800	\$250	\$1,535
43	First Floor	Classroom 38	1'x4' Surface Mount, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	12	144	1,728	2,200	3,802	Retrofit fixture with (4) LED Tubes	12	80	300	Ceiling	1	960	1,900	2,112	1,824	64	768	300	1,690	288	\$312	\$1,800	\$250	\$1,535
44	First Floor	Classroom 39	1'x4' Surface Mount, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	12	144	1,728	2,200	3,802	Retrofit fixture with (4) LED Tubes	12	80	300	Ceiling	1	960	1,900	2,112	1,824	64	768	300	1,690	288	\$312	\$1,800	\$250	\$1,535
45	First Floor	Girls Locker Room A	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Surface Mount, Prismatic Lens	6	68	409	2,200	900	Retrofit fixture with (2) LED Tubes	6	40	300	Ceiling	1	240	1,900	528	456	28	169	300	372	72	\$70	\$540	\$250	\$635
46	First Floor	Gilrs Locker Room B	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Surface Mount, Prismatic Lens	4	68	273	2,200	600	Retrofit fixture with (2) LED Tubes	4	40	300	Ceiling	1	160	1,900	352	304	28	113	300	248	48	\$47	\$360	\$250	\$495
47	First Floor	Gym Hallway	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	5,000	862	Retrofit fixture with (3) LED Tubes	2	60	0	Ceiling	0	120	5,000	600	600	26	52	0	262	0	\$41	\$240	\$0	\$180
48	First Floor	Electrical Closet	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pandant, Prismatic Lens	3	68	205	500	102	Retrofit fixture with (2) LED Tubes	3	40	0	Ceiling	0	120	500	60	60	28	85	0	42	0	\$7	\$270	\$0	\$210
49	First Floor	Electrical Closet	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pandant, Prismatic Lens	3	68	205	500	102	Retrofit fixture with (2) LED Tubes	3	40	0	Ceiling	0	120	500	60	60	28	85	0	42	0	\$7	\$270	\$0	\$210
50	First Floor	South East (SE) Entrance	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	5,000	431	Retrofit fixture with (3) LED Tubes	1	60	0	Ceiling	0	60	5,000	300	300	26	26	0	131	0	\$21	\$120	\$0	\$90
51	First Floor	Classroom 9	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	14	86	1,207	2,200	2,655	Retrofit fixture with (3) LED Tubes	14	60	300	Ceiling	1	840	1,900	1,848	1,596	26	367	300	807	252	\$167	\$1,680	\$250	\$1,475
52	First Floor	Classroom 9- Kitchen	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,200	378	Retrofit fixture with (3) LED Tubes	2	60	300	Ceiling	1	120	1,900	264	228	26	52	300	114	36	\$24	\$240	\$250	\$395
53	First Floor	Classroom 10	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	14	86	1,207	2,200	2,655	Retrofit fixture with (3) LED Tubes	14	60	300	Ceiling	1	840	1,900	1,848	1,596	26	367	300	807	252	\$167	\$1,680	\$250	\$1,475
54	First Floor	Custodian Room	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Surface Mount, Prismatic Lens	2	68	136	500	68	Retrofit fixture with (2) LED Tubes	2	40	0	Ceiling	0	80	500	40	40	28	56	0	28	0	\$4	\$180	\$0	\$140
55	First Floor	Storage Room	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	500	43	Retrofit fixture with (3) LED Tubes	1	60	0	Ceiling	0	60	500	30	30	26	26	0	13	0	\$2	\$120	\$0	\$90
56	First Floor	Boys Bathroom	2'x4' Recessed Troffer w/ Clear Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	2,200	189	Retrofit fixture with (3) LED Tubes	1	60	300	Ceiling	1	60	1,900	132	114	26	26	300	57	18	\$12	\$120	\$250	\$305
57	First Floor	Boys Bathroom	Recessed can fixture w/ no lens w/ (2) 18W Compact Fluorescent Lamp (CFL)	2	36	72	2,200	158	None	2	36	300	Ceiling	1	72	1,900	158	137	0	0	300	0	22	\$3	\$0	\$250	\$215
58	First Floor	Girls Bathroom	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	2,200	189	Retrofit fixture with (3) LED Tubes	1	60	300	Ceiling	1	60	1,900	132	114	26	26	300	57	18	\$12	\$120	\$250	\$305
59	First Floor	Classroom 12	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	14	86	1,207	2,200	2,655	Retrofit fixture with (3) LED Tubes	14	60	300	Ceiling	1	840	1,900	1,848	1,596	26	367	300	807	252	\$167	\$1,680	\$250	\$1,475
60	First Floor	Classroom 14	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	14	86	1,207	2,200	2,655	Retrofit fixture with (3) LED Tubes	14	60	300	Ceiling	1	840	1,900	1,848	1,596	26	367	300	807	252	\$167	\$1,680	\$250	\$1,475
61	First Floor	Classroom 11	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	86	516	2,200	1,135	Retrofit fixture with (3) LED Tubes	6	60	300	Ceiling	1	360	1,900	792	684	26	156	300	343	108	\$71	\$720	\$250	\$755
62	First Floor	Classroom 12 Kitchen	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,200	378	Retrofit fixture with (3) LED Tubes	2	60	300	Ceiling	1	120	1,900	264	228	26	52	300	114	36	\$24	\$240	\$250	\$395
63	First Floor	Classroom 13	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	86	516	2,200	1,135	Retrofit fixture with (3) LED Tubes	6	60	300	Ceiling	1	360	1,900	792	684	26	156	300	343	108	\$71	\$720	\$250	\$755
64	First Floor	Classroom 15	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	9	86	774	2,200	1,703	Retrofit fixture with (3) LED Tubes	9	60	300	Ceiling	1	540	1,900	1,188	1,026	26	234	300	515	162	\$107	\$1,080	\$250	\$1,025
65	First Floor	Kindergarden Room 16	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	12	86	1,032	2,200	2,270	Retrofit fixture with (3) LED Tubes	12	60	300	Ceiling	1	720	1,900	1,584	1,368	26	312	300	686	216	\$142	\$1,440	\$250	\$1,295
66	First Floor	Closet	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	500	43	Retrofit fixture with (3) LED Tubes	1	60	0	Ceiling	0	60	500	30	30	26	26	0	13	0	\$2	\$120	\$0	\$90
67	First Floor	Classroom 17	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	10	86	860	2,200	1,892	Retrofit fixture with (3) LED Tubes	10	60	300	Ceiling	1	600	1,900	1,320	1,140	26	260	300	572	180	\$119	\$1,200	\$250	\$1,115
68	First Floor	Closet	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	500	43	Retrofit fixture with (3) LED Tubes	1	60	0	Ceiling	0	60	500	30	30	26	26	0	13	0	\$2	\$120	\$0	\$90

Dom	Particological American Contraction Contractico Contra		LIGHTING UPGRADE PROJECT LINE x LINE DETAIL		ISTOM CILITY				Dunellen Public Schools John P. Faber School	FAC	CILITY S 89,203	-			TE OF AU 12/12/20 <sup>-</sup>	-								
	SPACE	DESCRIPTION								REF	PLACE	MENT F	IXTURES	;							ENERG	BY ANAL	YSIS	
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	default annual hours 910	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS 910	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS) \$0.158
69	First Floor	Classroom 18	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	10	86	860	2,200	1,892	Retrofit fixture with (3) LED Tubes	10	60	300	Ceiling	1	600	1,900	1,320	1,140	26	260	300	572	180	\$119
70	First Floor	Classroom 19	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	12	86	1,032	2,200	2,270	Retrofit fixture with (3) LED Tubes	12	60	300	Ceiling	1	720	1,900	1,584	1,368	26	312	300	686	216	\$142
71	First Floor	Classroom 20	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	11	86	946	2,200	2,081	Retrofit fixture with (3) LED Tubes	11	60	300	Ceiling	1	660	1,900	1,452	1,254	26	286	300	629	198	\$131
72	First Floor	Classroom 21	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	11	86	946	2,200	2,081	Retrofit fixture with (3) LED Tubes	11	60	300	Ceiling	1	660	1,900	1,452	1,254	26	286	300	629	198	\$131
73	First Floor	Classroom 22	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	11	86	946	2,200	2,081	Retrofit fixture with (3) LED Tubes	11	60	300	Ceiling	1	660	1,900	1,452	1,254	26	286	300	629	198	\$131
74	First Floor	Boys Room	2'x4' Recessed Troffer w/ Clear Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	2,200	189	Retrofit fixture with (3) LED Tubes	1	60	300	Ceiling	1	60	1,900	132	114	26	26	300	57	18	\$12
75	First Floor	Girls Room	2'x4' Recessed Troffer w/ Clear Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	2,200	189	Retrofit fixture with (3) LED Tubes	1	60	300	Ceiling	1	60	1,900	132	114	26	26	300	57	18	\$12
76	First Floor	Elevator Closet	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Surface Mount, Prismatic Lens	1	68	68	500	34	Retrofit fixture with (2) LED Tubes	1	40	0	Ceiling	0	40	500	20	20	28	28	0	14	0	\$2
77	First Floor	Computer Room	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	15	86	1,290	2,200	2,838	Retrofit fixture with (3) LED Tubes	15	60	300	Ceiling	1	900	1,900	1,980	1,710	26	390	300	858	270	\$178
78	First Floor	Classroom 24	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	8	86	688	2,200	1,514	Retrofit fixture with (3) LED Tubes	8	60	300	Ceiling	1	480	1,900	1,056	912	26	208	300	458	144	\$95
79	First Floor	Classroom 26	2'x4' Recessed Troffer, No Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	107	427	2,200	939	Retrofit fixture with (4) LED Tubes	4	80	300	Ceiling	1	320	1,900	704	608	27	107	300	235	96	\$52
80	First Floor	Classroom 27	2'x4' Recessed Troffer, No Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	107	427	2,200	939	Retrofit fixture with (4) LED Tubes	4	80	300	Ceiling	1	320	1,900	704	608	27	107	300	235	96	\$52
81	First Floor	Media Center	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	14	86	1,204	2,200	2,649	Retrofit fixture with (3) LED Tubes	14	60	300	Ceiling	1	840	1,900	1,848	1,596	26	364	300	801	252	\$166
82	First Floor	Media Center	Recessed Round Fixtures with 150 W Metal Halide Lamps	35	185	6,475	2,200	14,245	45 Watt LED Fixtures	35	45	300	Ceiling	1	1,575	1,900	3,465	2,993	140	4,900	300	10,780	473	\$1,775
83	First Floor	Media Center	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	86	516	2,200	1,135	Retrofit fixture with (3) LED Tubes	6	60	300	Ceiling	1	360	1,900	792	684	26	156	300	343	108	\$71
84	First Floor	Circulation Desk	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	86	516	2,200	1,135	Retrofit fixture with (3) LED Tubes	6	60	300	Ceiling	1	360	1,900	792	684	26	156	300	343	108	\$71
85	First Floor	Mechanical Storage Room	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	5	86	430	500	215	Retrofit fixture with (3) LED Tubes	5	60	0	Ceiling	0	300	500	150	150	26	130	0	65	0	\$10
86	First Floor	GYM A	400W Metal Halide Fixtures (Pandant)	15	460	6,900	2,500	17,250	4 Lamp F54T5HO/ (54W) High Bay Fixture with Wireguard	15	236	300	Ceiling	1	3,540	2,200	8,850	7,788	224	3,360	300	8,400	1,062	\$1,493
87	First Floor	GYM B	400W Metal Halide Fixtures (Pandant)	15	460	6,900	2,500	17,250	4 Lamp F54T5HO/ (54W) High Bay Fixture with Wireguard	15	236	300	Ceiling	1	3,540	2,200	8,850	7,788	224	3,360	300	8,400	1,062	\$1,493
88	First Floor	Gym Officce	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	86	259	2,200	569	Retrofit fixture with (3) LED Tubes	3	60	300	Wall	1	180	1,900	396	342	26	79	300	173	54	\$36
89	First Floor	Boys Locker Room A	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Surface Mount, Prismatic Lens	6	68	409	2,200	900	Retrofit fixture with (2) LED Tubes	6	40	300	Ceiling	1	240	1,900	528	456	28	169	300	372	72	\$70
90	First Floor	Boys Locker Room B	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Surface Mount, Prismatic Lens	4	68	273	2,200	600	Retrofit fixture with (2) LED Tubes	4	40	300	Ceiling	1	160	1,900	352	304	28	113	300	248	48	\$47
91	First Floor	Trainers Office	1'x4' Surface Fixture, Prismatic Lens, w/ (3) F32T8 700 Lamps & (1) Electronic Ballast	2	86	172	2,200	378	Retrofit fixture with (3) LED Tubes	2	60	300	Wall	1	120	1,900	264	228	26	52	300	114	36	\$24
92	Second Floor	Storage Room	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pandant, Prismatic Lens	4	68	273	500	136	Retrofit fixture with (2) LED Tubes	4	40	0	Ceiling	0	160	500	80	80	28	113	0	56	0	\$9
93	Second Floor	Classroom 207	2'x4' Recessed Troffer w/ Clear Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	11	86	946	2,200	2,081	Retrofit fixture with (3) LED Tubes	11	60	300	Ceiling	1	660	1,900	1,452	1,254	26	286	300	629	198	\$131
94	Second Floor	Classroom 207	2'x2' Recessed Troffer, No Lens, w/ (2) FBO31T8/835, 32w 800 U- Lamps & (1) Electronic Ballast	1	64	64	2,200	140	Retrofit fixture with (2) LED U-Tubes	1	52	300	Ceiling	1	52	1,900	114	99	12	12	300	26	16	\$6
95	Second Floor	Classroom 210	2'x4' Recessed Troffer w/ Clear Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	11	86	946	2,200	2,081	Retrofit fixture with (3) LED Tubes	11	60	300	Ceiling	1	660	1,900	1,452	1,254	26	286	300	629	198	\$131
96	Second Floor	Classroom 210	2'x2' Recessed Troffer, No Lens, w/ (2) FBO31T8/835, 32w 800 U- Lamps & (1) Electronic Ballast	1	64	64	2,200	140	Retrofit fixture with (2) LED U-Tubes	1	52	300	Ceiling	1	52	1,900	114	99	12	12	300	26	16	\$6
97	Second Floor	Storage Room	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pandant, Prismatic Lens	4	68	273	500	136	Retrofit fixture with (2) LED Tubes	4	40	0	Ceiling	0	160	500	80	80	28	113	0	56	0	\$9
98	Second Floor	Boys Room	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	2,200	189	Retrofit fixture with (3) LED Tubes	1	60	300	Ceiling	1	60	1,900	132	114	26	26	300	57	18	\$12
99	Second Floor	Boys Room	Recessed can fixture w/ no lens w/ (2) 18W Compact Fluorescent Lamp (CFL)	2	36	72	2,200	158	None	2	36	300	Ceiling	1	72	1,900	158	137	0	0	300	0	22	\$3
100	Second Floor	Custodian Room	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Surface Mount, Prismatic Lens	1	68	68	500	34	Retrofit fixture with (2) LED Tubes	1	40	300	Ceiling	1	40	200	20	8	28	28	300	14	12	\$4
101	Second Floor	Girls Room	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	2,200	189	Retrofit fixture with (3) LED Tubes	1	60	300	Ceiling	1	60	1,900	132	114	26	26	300	57	18	\$12
102	Second Floor	Girls Room	Recessed can fixture w/ no lens w/ (2) 18W Compact Fluorescent Lamp (CFL)	2	36	72	2,200	158	None	2	36	300	Ceiling	1	72	1,900	158	137	0	0	300	0	22	\$3

TOTAL FIXTURE COST (MATERIAL PLUS LABOR) \$1,200 \$250	INSTALLED COST AFTER INCENTIVES
\$1 200 \$250	¢1.115
¢.,200 \$200	\$1,115
\$1,440 \$250	\$1,295
\$1,320 \$250	\$1,205
\$1,320 \$250	\$1,205
\$1,320 \$250	\$1,205
\$120 \$250	\$305
\$120 \$250	\$305
\$90 \$0	\$70
\$1,800 \$250	\$1,565
\$960 \$250	\$935
\$600 \$250	\$655
\$600 \$250	\$655
\$1,680 \$250	\$1,475
\$3,500 \$250	\$3,365
\$720 \$250	\$755
\$720 \$250	\$755
\$600 \$0	\$450
\$6,000 \$250	\$4,715
\$6,000 \$250	\$4,715
\$360 \$120	\$370
\$540 \$250	\$635
\$360 \$250	\$495
\$240 \$120	\$280
\$360 \$0	\$280
\$1,320 \$250	\$1,205
\$150 \$250	\$345
\$1,320 \$250	\$1,205
\$150 \$250	\$345
\$360 \$0	\$280
\$120 \$250	\$305
\$0 \$250	\$215
\$90 \$250	\$285
\$120 \$250	\$305
\$0 \$250	\$215

Don	Tech, Inc.		LIGHTING UPGRADE PROJECT LINE x LINE DETAIL		STOM CILITY				Dunellen Public Schools John P. Faber School			FA	CILITY 89,20	SQ. FT. 03			ΓΕ ΟF Αι 12/12/20 <sup>7</sup>										
	SPACE D	ESCRIPTION								REP	LACE	MENT	FIXTURE	S							ENERG	Y ANAL	YSIS		COS		IS
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS 910	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAI HOURS SAVED	SENSOR	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS 910	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	total annual \$ savings / line (including sensors) \$0.158	TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
103	Second Floor	Classroom 208	2'x4' Recessed Troffer w/ Clear Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	11	86	946	2,200	2,081	Retrofit fixture with (3) LED Tubes	11	60	300	Ceiling	1	660	1,900	1,452	1,254	26	286	300	629	198	\$131	\$1,320	\$250	\$1,205
104	Second Floor	Classroom 208	2'x2' Recessed Troffer, No Lens, w/ (2) FBO31T8/835, 32w 800 U- Lamps & (1) Electronic Ballast	1	64	64	2,200	140	Retrofit fixture with (2) LED U-Tubes	1	52	300	Ceiling	1	52	1,900	114	99	12	12	300	26	16	\$6	\$150	\$250	\$345
105	Second Floor	Classroom 206	2'x4' Recessed Troffer w/ Clear Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	11	86	946	2,200	2,081	Retrofit fixture with (3) LED Tubes	11	60	300	Ceiling	1	660	1,900	1,452	1,254	26	286	300	629	198	\$131	\$1,320	\$250	\$1,205
106	Second Floor	Classroom 206	2'x2' Recessed Troffer, No Lens, w/ (2) FBO31T8/835, 32w 800 U- Lamps & (1) Electronic Ballast	1	64	64	2,200	140	Retrofit fixture with (2) LED U-Tubes	1	52	300	Ceiling	1	52	1,900	114	99	12	12	300	26	16	\$6	\$150	\$250	\$345
107	Second Floor	Hallway	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	11	86	948	5,000	4,741	Retrofit fixture with (3) LED Tubes	11	60	0	Ceiling	0	660	5,000	3,300	3,300	26	288	0	1,441	0	\$227	\$1,320	\$0	\$990
108	Second Floor	Classroom 203	2'x4' Recessed Troffer w/ Clear Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	11	86	946	2,200	2,081	Retrofit fixture with (3) LED Tubes	11	60	300	Ceiling	1	660	1,900	1,452	1,254	26	286	300	629	198	\$131	\$1,320	\$250	\$1,205
109	Second Floor	Classroom 203	2'x2' Recessed Troffer, No Lens, w/ (2) FBO31T8/835, 32w 800 U- Lamps & (1) Electronic Ballast	1	64	64	2,200	140	Retrofit fixture with (2) LED U-Tubes	1	52	300	Ceiling	1	52	1,900	114	99	12	12	300	26	16	\$6	\$150	\$250	\$345
110	Second Floor	Classroom 205	2'x4' Recessed Troffer w/ Clear Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	11	86	946	2,200	2,081	Retrofit fixture with (3) LED Tubes	11	60	300	Ceiling	1	660	1,900	1,452	1,254	26	286	300	629	198	\$131	\$1,320	\$250	\$1,205
111	Second Floor	Classroom 205	2'x2' Recessed Troffer, No Lens, w/ (2) FBO31T8/835, 32w 800 U- Lamps & (1) Electronic Ballast	1	64	64	2,200	140	Retrofit fixture with (2) LED U-Tubes	1	52	300	Ceiling	1	52	1,900	114	99	12	12	300	26	16	\$6	\$150	\$250	\$345
112	Second Floor	Classroom 204	2'x4' Recessed Troffer w/ Clear Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	11	86	946	2,200	2,081	Retrofit fixture with (3) LED Tubes	11	60	300	Ceiling	1	660	1,900	1,452	1,254	26	286	300	629	198	\$131	\$1,320	\$250	\$1,205
113	Second Floor	Classroom 204	2'x2' Recessed Troffer, No Lens, w/ (2) FBO31T8/835, 32w 800 U- Lamps & (1) Electronic Ballast	1	64	64	2,200	140	Retrofit fixture with (2) LED U-Tubes	1	52	300	Ceiling	1	52	1,900	114	99	12	12	300	26	16	\$6	\$150	\$250	\$345
114	Second Floor	Classroom 202	2'x4' Recessed Troffer w/ Clear Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	11	86	946	2,200	2,081	Retrofit fixture with (3) LED Tubes	11	60	300	Ceiling	1	660	1,900	1,452	1,254	26	286	300	629	198	\$131	\$1,320	\$250	\$1,205
115	Second Floor	Classroom 202	2'x2' Recessed Troffer, No Lens, w/ (2) FBO31T8/835, 32w 800 U- Lamps & (1) Electronic Ballast	1	64	64	2,200	140	Retrofit fixture with (2) LED U-Tubes	1	52	300	Ceiling	1	52	1,900	114	99	12	12	300	26	16	\$6	\$150	\$250	\$345
116	Second Floor	Classroom 201	2'x4' Recessed Troffer w/ Clear Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	11	86	946	2,200	2,081	Retrofit fixture with (3) LED Tubes	11	60	300	Ceiling	1	660	1,900	1,452	1,254	26	286	300	629	198	\$131	\$1,320	\$250	\$1,205
117	Second Floor	Classroom 201	2'x2' Recessed Troffer, No Lens, w/ (2) FBO31T8/835, 32w 800 U- Lamps & (1) Electronic Ballast	1	64	64	2,200	140	Retrofit fixture with (2) LED U-Tubes	1	52	300	Ceiling	1	52	1,900	114	99	12	12	300	26	16	\$6	\$150	\$250	\$345
118	Second Floor	Board of Secretary	2'x4' Surface Fixture, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	345	2,200	759	Retrofit fixture with (3) LED Tubes	4	60	300	Ceiling	1	240	1,900	528	456	26	105	300	231	72	\$48	\$480	\$250	\$575
119	Second Floor	Hallway	2'x2' Recessed Troffer, No Lens, w/ (2) FBO31T8/835, 32w 800 U- Lamps & (1) Electronic Ballast	5	64	318	5,000	1,590	Retrofit fixture with (2) LED U-Tubes	5	52	0	Ceiling	0	260	5,000	1,300	1,300	12	58	0	290	0	\$46	\$750	\$0	\$650
120	Second Floor	Office	2'x4' Surface Fixture, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	86	259	2,200	569	Retrofit fixture with (3) LED Tubes	3	60	300	Wall	1	180	1,900	396	342	26	79	300	173	54	\$36	\$360	\$120	\$370
121	Second Floor	Office	2'x4' Surface Fixture, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	86	259	2,200	569	Retrofit fixture with (3) LED Tubes	3	60	300	Wall	1	180	1,900	396	342	26	79	300	173	54	\$36	\$360	\$120	\$370
122	Second Floor	Office	2'x4' Surface Fixture, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	86	259	2,200	569	Retrofit fixture with (3) LED Tubes	3	60	300	Wall	1	180	1,900	396	342	26	79	300	173	54	\$36	\$360	\$120	\$370
123	Second Floor	Office	2'x4' Surface Fixture, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	86	259	2,200	569	Retrofit fixture with (3) LED Tubes	3	60	300	Wall	1	180	1,900	396	342	26	79	300	173	54	\$36	\$360	\$120	\$370
124	Second Floor	Conference Room	2'x4' Surface Fixture, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	86	517	2,200	1,138	Retrofit fixture with (3) LED Tubes	6	60	300	Ceiling	1	360	1,900	792	684	26	157	300	346	108	\$72	\$720	\$250	\$755
125	Second Floor	Office	2'x4' Surface Fixture, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	86	259	2,200	569	Retrofit fixture with (3) LED Tubes	3	60	300	Wall	1	180	1,900	396	342	26	79	300	173	54	\$36	\$360	\$120	\$370
126	Second Floor	Meeting Room	2'x4' Surface Fixture, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	86	517	2,200	1,138	Retrofit fixture with (3) LED Tubes	6	60	300	Wall	1	360	1,900	792	684	26	157	300	346	108	\$72	\$720	\$120	\$640
127	Second Floor	Bathroom	Recessed can fixture w/ no lens w/ (2) 18W Compact Fluorescent Lamp (CFL)	2	36	72	2,200	158	None	2	36	300	Ceiling	1	72	1,900	158	137	0	0	300	0	22	\$3	\$0	\$250	\$215
128	Second Floor	Bathroom	Recessed can fixture w/ no lens w/ (2) 18W Compact Fluorescent Lamp (CFL)	2	36	72	2,200	158	None	2	36	300	Ceiling	1	72	1,900	158	137	0	0	300	0	22	\$3	\$0	\$250	\$215
129	First Floor	Main Office Vestibule	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pandant, No Lens	8	68	546	2,200	1,200	Retrofit fixture with (2) LED Tubes	8	40	300	Wall	1	320	1,900	704	608	28	226	300	496	96	\$93	\$720	\$120	\$660
130	First Floor	Main Office	4' Fluorescent Recessed Strip with (2) F32T8 700 Lamps & (1) Electronic Ballast, Prismatic Lens	11	62	682	2,200	1,500	Retrofit fixture with (2) LED Tubes	11	40	300	Wall	1	440	1,900	968	836	22	242	300	532	132	\$105	\$990	\$120	\$870
131	First Floor	Principals Office	4' Fluorescent Recessed Strip with (2) F32T8 700 Lamps & (1) Electronic Ballast, Prismatic Lens	4	62	248	2,200	546	Retrofit fixture with (2) LED Tubes	4	40	300	Ceiling	1	160	1,900	352	304	22	88	300	194	48	\$38	\$360	\$250	\$495
132	First Floor	Copy Room 3	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	8	62	496	2,200	1,091	Retrofit fixture with (2) LED Tubes	8	40	300	Ceiling	1	320	1,900	704	608	22	176	300	387	96	\$76	\$720	\$250	\$775
133	First Floor	Conference Room 58	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	62	248	2,200	546	Retrofit fixture with (2) LED Tubes	4	40	300	Ceiling	1	160	1,900	352	304	22	88	300	194	48	\$38	\$360	\$250	\$495
134	First Floor	Mens Faculty	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	62	62	5,000	310	Retrofit fixture with (2) LED Tubes	1	40	300	Ceiling	1	40	4,700	200	188	22	22	300	110	12	\$19	\$90	\$250	\$285
135	First Floor	Classroom 52	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	7	86	602	2,200	1,324	Retrofit fixture with (3) LED Tubes	7	60	300	Ceiling	1	420	1,900	924	798	26	182	300	400	126	\$83	\$840	\$250	\$845
136	First Floor	Classroom 55	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	9	62	558	2,200	1,228	Retrofit fixture with (2) LED Tubes	9	40	300	Ceiling	1	360	1,900	792	684	22	198	300	436	108	\$86	\$810	\$250	\$845

Don	Pare-Tech, Inc.		LIGHTING UPGRADE PROJECT LINE x LINE DETAIL		JSTOM CILITY				Dunellen Public Schools John P. Faber School			FAC	CILITY S 89,20				TE OF AU 12/12/20 <sup>-</sup>	-									
	SPACE	DESCRIPTION								REF	PLACE	MENT F	IXTURE	S							ENERG	Y ANAL	YSIS		COS	T ANALYSI	S
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS 910	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS 910	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS) \$0.158	TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
137	First Floor	Room 55 Examiner	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	62	124	2,200	273	Retrofit fixture with (2) LED Tubes	2	40	300	Ceiling	1	80	1,900	176	152	22	44	300	97	24	\$19	\$180	\$250	\$355
138	First Floor	Classroom 54	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	14	86	1,204	2,200	2,649	Retrofit fixture with (3) LED Tubes	14	60	300	Ceiling	1	840	1,900	1,848	1,596	26	364	300	801	252	\$166	\$1,680	\$250	\$1,475
139	First Floor	Classroom 53	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	15	86	1,290	2,200	2,838	Retrofit fixture with (3) LED Tubes	15	60	300	Ceiling	1	900	1,900	1,980	1,710	26	390	300	858	270	\$178	\$1,800	\$250	\$1,565
140	First Floor	Classroom 50	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	15	86	1,290	2,200	2,838	Retrofit fixture with (3) LED Tubes	15	60	300	Ceiling	1	900	1,900	1,980	1,710	26	390	300	858	270	\$178	\$1,800	\$250	\$1,565
141	First Floor	Classroom 51	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	15	86	1,290	2,200	2,838	Retrofit fixture with (3) LED Tubes	15	60	300	Ceiling	1	900	1,900	1,980	1,710	26	390	300	858	270	\$178	\$1,800	\$250	\$1,565
142	First Floor	Classroom 8	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	345	2,200	759	Retrofit fixture with (3) LED Tubes	4	60	300	Ceiling	1	240	1,900	528	456	26	105	300	231	72	\$48	\$480	\$250	\$575
143	First Floor	Sprinkler Room	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Surface Mount, Prismatic Lens	1	68	68	500	34	Retrofit fixture with (2) LED Tubes	1	40	0	Ceiling	0	40	500	20	20	28	28	0	14	0	\$2	\$90	\$0	\$70
142	First Floor	Hallway	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	86	259	5,000	1,293	Retrofit fixture with (3) LED Tubes	3	60	300	Ceiling	1	180	4,700	900	846	26	79	300	393	54	\$71	\$360	\$250	\$485
143	First Floor	Hallway	4' Fluorescent Strip with (1) F32T8 & (1) Electronic Ballast, Recessed, No Lens	48	35	1,680	5,000	8,400	Retrofit fixture with (1) LED Tube	48	20	300	Ceiling	1	960	4,700	4,800	4,512	15	720	300	3,600	288	\$613	\$2,880	\$250	\$2,615
142	First Floor	Hallway	2'x2' Recessed Troffer, No Lens, w/ (2) FBO31T8/835, 32w 800 U- Lamps & (1) Electronic Ballast	6	64	382	5,000	1,908	Retrofit fixture with (2) LED U-Tubes	6	52	300	Ceiling	1	312	4,700	1,560	1,466	12	70	300	348	94	\$70	\$900	\$250	\$995
143	First Floor	Old to New Corridor	2'x2' Recessed Troffer, No Lens, w/ (2) FBO31T8/835, 32w 800 U- Lamps & (1) Electronic Ballast	5	64	318	5,000	1,590	Retrofit fixture with (2) LED U-Tubes	5	52	0	Ceiling	0	260	5,000	1,300	1,300	12	58	0	290	0	\$46	\$750	\$0	\$650
144	Second Floor	Stairwell BOE	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	5	86	430	8,760	3,767	Retrofit fixture with (3) LED Tubes	5	60	0	Ceiling	0	300	8,760	2,628	2,628	26	130	0	1,139	0	\$180	\$600	\$0	\$450
145	Second Floor	Stairwell Gym	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	5	86	430	8,760	3,767	Retrofit fixture with (3) LED Tubes	5	60	0	Ceiling	0	300	8,760	2,628	2,628	26	130	0	1,139	0	\$180	\$600	\$0	\$450
146	-	Exit Signs	Exit Sign - 20W incandescent	14	20	280	8,760	2,453	5W LED Exit Sign	14	5	0	Ceiling	0	70	8,760	613	613	15	210	0	1,840	0	\$290	\$700	\$0	\$700
				996	6	107,390		254,685		996				117	63,543		151,418	133,812				103,267	17,607	19,070	126,815	27,820	119,745



### LIGHTING RETROFIT SUMMARY FOR: Lincoln Middle School 411 1st Street, Dunellen, NJ 08812

BUILDING INFORM	ATION	E	XISTING	<b>G FIXTURE</b>	ES	F	ROPOS	ED FIXTUR	ES			SA	VINGS							FINANC	IAL		
BUILDING	SQ. FT.	PRE TOTAL FIXT. QTY	PRE TOTAL FIXT. WATTS	PRE ANNUAL KWH CONSUMPTI ON	PRE WATTS / SQ. FT	POST TOTAL FIXT. QTY	POST TOTAL FIXT. WATTS	POST ANNUAL KWH CONSUMPTION	POST WATTS / SQ. FT	WATTS SAVED	ANNUAL KWH SAVED WITH FIXTURES	ANNUAL KWH SAVED WITH SENSORS	TOTAL ANNUAL KWH SAVED	ANNUAL SAVINGS \$ FIXT.	\$	ANNUAL SAVINGS \$ TOTAL	CO2 REDUCTION (TONS)	NJ Smart Start FIXTURE REBATE \$	NJ Smart Start SENSOR REBATE \$		SENSORS TOTAL (INSTALLED) COST \$	MATERIAL TOTAL (INSTALLED) COST \$	SIMPLE PAYBACK AFTER REBATE (YEARS)
Lincoln Middle School	26,248	458	33,373	102,536	1.27	456	22,107	69,057	0.84	11,266	33,479	5,324	38,803	\$5,223	\$830	\$6,053	11.1	\$5,750	\$1,960	\$45,725	\$11,000	\$56,725	8.1

3%	PERCENTAGE OF REBATES IN TOTAL INSTALLED COST
67%	PERCENTAGE OF CONSUMPTION COMPARE TO EXISTING STATE
38%	EXISTING PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING
26%	PROPOSED PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING

Dom	P		LIGHTING UPGRADE PROJECT LINE x LINE DETAIL		ISTOM CILITY				Dunellen Public Schools Lincoln Middle School			FAC	ILITY S 26,248			DA	TE OF A	-	]						
	SPACE	DESCRIPTION								REP	LACEN	MENT FI	KTURES								ENERG	Y ANAL	YSIS		
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS 910	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS 910	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS) \$0.156	
1	2 Basement	3 Basement	4 4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pandant, Prismatic Lens	5 7	6 68	477	<b>8</b> 8,760	<b>9</b> 4,182	11 Retrofit fixture with (2) LED Tubes	12 7	<b>13</b> 40	14 1,500	15 Ceiling	16 2	17 280	18 7,260	<b>19</b> 2,453	<b>20</b> 2,033	21 28	22 197	23 1,500	24 1,729	<b>25</b> 420	26 \$335	
2	Basement	Corridor	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pandant, Prismatic Lens	1	68	68	8,760	597	Retrofit fixture with (2) LED Tubes	1	40	1,500	Ceiling	2	40	7,260	350	290	28	28	1,500	247	60	\$48	
3	Basement	File Storage #1	2'x4' Wall Mounted, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Magnetic Ballast	1	144	144	500	72	Retrofit fixture with (4) LED Tubes	0	80	0	Ceiling	0	0	500	0	0	64	0	0	0	0	\$0	
4	Basement	Corridor	8' Surface Mount Fixture, Prismatic Lens, w/ (2) F96T12/75w Lamps & (1) Magnetic Ballast	1	142	142	8,760	1,240	New 8ft Strip fixture w /(4) 4ft F28T8 Lamps & (1) Elec. Low-Power High Efficiency Ballast	1	98	1,500	Ceiling	1	98	7,260	858	711	44	44	1,500	381	147	\$82	
5	Basement	File Storage #1	2'x4' Surface Mount, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Magnetic Ballast	1	144	144	500	72	Retrofit fixture with (4) LED Tubes	0	80	300	Ceiling	1	0	200	0	0	64	0	300	0	0	\$0	
6	Basement	Small Corridor	2'x4' Wall Mounted, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Magnetic Ballast	1	144	144	8,760	1,261	Retrofit fixture with (4) LED Tubes	1	80	1,500	Ceiling	1	80	7,260	701	581	64	64	1,500	561	120	\$106	
7	Basement	Small Corridor	1'x4' Surface Fixture, Prismatic Lens, w/ (2) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	1	66	66	8,760	578	Retrofit fixture with (2) LED Tubes	1	40	300	Ceiling	1	40	8,460	350	338	26	26	300	228	12	\$37	
8	Basement	Switch Room	1'x4' Surface Fixture, Prismatic Lens, w/ (2) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	1	66	66	2,000	132	Retrofit fixture with (2) LED Tubes	1	40	0	Ceiling	0	40	2,000	80	80	26	26	0	52	0	\$8	
9	Basement	Switch Room	60W incandescent	3	60	180	2,000	360	18W CFL	3	18	0	Ceiling	0	54	2,000	108	108	42	126	0	252	0	\$39	
10	Basement	Switch Room	Wall Mounted 4'Strip Fixture, No Lens, w/ (1) F40T12/34w Lamp & (1) Energy Saving Magnetic Ballast	2	40	79	2,000	159	Retrofit fixture with (1) LED Tube	2	20	0	Ceiling	0	40	2,000	80	80	20	39	0	79	0	\$12	
11	Basement	File Storage #2	2'x4' Surface Mount, Prismatic Lens, w/ (2) F40T12/34w Lamps & (1) Magnetic Ballast	1	66	66	2,200	145	Retrofit fixture with (2) LED Tubes	1	40	300	Ceiling	1	40	1,900	88	76	26	26	300	57	12	\$11	
12	Basement	Workshop	2'x4' Surface Mount Fixture, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	62	248	8,760	2,172	Retrofit fixture with (3) LED Tubes	4	60	0	Ceiling	0	240	8,760	2,102	2,102	2	8	0	70	0	\$11	
13	Basement	Boiler Room	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pandant, No Lens	3	68	205	8,760	1,792	Retrofit fixture with (2) LED Tubes	3	40	0	Ceiling	0	120	8,760	1,051	1,051	28	85	0	741	0	\$116	1
14	Basement	Closet #1	Wall Mounted Fixture - 150W incandescent	1	150	150	2,200	330	42 Watt LED Wall Pack	1	42	0	Ceiling	0	42	2,200	92	92	108	108	0	238	0	\$37	
15	Basement	Closet #2	Wall Mounted Fixture - 150W incandescent	1	150	150	2,200	330	42 Watt LED Wall Pack	1	42	0	Ceiling	0	42	2,200	92	92	108	108	0	238	0	\$37	
16	Basement	Closet #2	60W incandescent	1	60	60	2,200	132	18W CFL	1	18	0	Ceiling	0	18	2,200	40	40	42	42	0	92	0	\$14	1
17	First Floor	Stariwell L-B	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Surface Mount, Prismatic Lens	2	68	136	8,760	1,195	Retrofit fixture with (2) LED Tubes	2	40	0	Ceiling	0	80	8,760	701	701	28	56	0	494	0	\$77	
18	First Floor	Mechanical Room	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pandant, Prismatic Lens	6	68	409	2,200	900	Retrofit fixture with (2) LED Tubes	6	40	0	Ceiling	0	240	2,200	528	528	28	169	0	372	0	\$58	1
19	First Floor	Cafeteria Hallway	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	5	62	310	5,000	1,550	Retrofit fixture with (2) LED Tubes	5	40	0	Ceiling	0	200	5,000	1,000	1,000	22	110	0	550	0	\$86	
20	First Floor	Cafeteria Hallway	Screw-in Compact Fluorescent Lamp (23W)	7	23	161	5,000	805	None	7	23	0	Ceiling	0	161	5,000	805	805	0	0	0	0	0	\$0	
21	First Floor	Janitor's Closet	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pandant, Prismatic Lens	1	68	68	500	34	Retrofit fixture with (2) LED Tubes	1	40	0	Ceiling	0	40	500	20	20	28	28	0	14	0	\$2	
22	First Floor	Girls Room	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	5	62	310	2,200	682	Retrofit fixture with (2) LED Tubes	5	40	300	Ceiling	1	200	1,900	440	380	22	110	300	242	60	\$47	
23	First Floor	Boys Room	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	5	62	310	2,200	682	Retrofit fixture with (2) LED Tubes	5	40	300	Ceiling	1	200	1,900	440	380	22	110	300	242	60	\$47	
24	First Floor	Cafeteria	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	36	62	2,232	2,200	4,910	Retrofit fixture with (2) LED Tubes	36	40	300	Ceiling	1	1,440	1,900	3,168	2,736	22	792	300	1,742	432	\$339	
25	First Floor	Cafeteria Closet	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pandant, Prismatic Lens	3	68	205	500	102	Retrofit fixture with (2) LED Tubes	3	40	0	Ceiling	0	120	500	60	60	28	85	0	42	0	\$7	
26	First Floor	Kitchen	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	9	62	558	2,200	1,228	Retrofit fixture with (2) LED Tubes	9	40	0	Ceiling	0	360	2,200	792	792	22	198	0	436	0	\$68	
27	First Floor	Kitchen Hallway	2'x4' Surface Mount, Prismatic Lens, w/ (2) F40T12/34w Lamps & (1) Magnetic Ballast	1	66	66	5,000	330	Retrofit fixture with (2) LED Tubes	1	40	0	Ceiling	0	40	5,000	200	200	26	26	0	130	0	\$20	
28	First Floor	Faculty Room	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	10	62	620	2,200	1,364	Retrofit fixture with (2) LED Tubes	10	40	300	Ceiling	1	400	1,900	880	760	22	220	300	484	120	\$94	
29	First Floor	Faculty Room	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	62	62	2,200	136	Retrofit fixture with (2) LED Tubes	1	40	300	Ceiling	1	40	1,900	88	76	22	22	300	48	12	\$9	
30	First Floor	Faculty Room	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	62	62	2,200	136	Retrofit fixture with (2) LED Tubes	1	40	300	Ceiling	1	40	1,900	88	76	22	22	300	48	12	\$9	
31	First Floor	Ramp	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	7	62	434	5,000	2,170	Retrofit fixture with (2) LED Tubes	7	40	0	Ceiling	0	280	5,000	1,400	1,400	22	154	0	770	0	\$120	
32	First Floor	Ramp	Screw-in Compact Fluorescent Lamp (23W)	1	23	23	5,000	115	None	1	23	0	Ceiling	0	23	5,000	115	115	0	0	0	0	0	\$0	
33	First Floor	Classroom L6	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	62	372	2,200	818	Retrofit fixture with (2) LED Tubes	6	40	300	Ceiling	1	240	1,900	528	456	22	132	300	290	72	\$57	
34	First Floor	Main Entrance	Screw-in Compact Fluorescent Lamp (23W)	10	23	230	5,000	1,150	None	10	23	0	Ceiling	0	230	5,000	1,150	1,150	0	0	0	0	0	\$0	

COS		S
TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
<b>27</b> \$630	28 \$500	<b>29</b> \$850
\$90	\$500	\$310
\$0	\$0	\$0
\$100	\$250	\$315
\$0	\$250	\$215
\$150	\$250	\$365
\$90	\$250	\$305
\$90	\$0	\$90
\$15	\$0	\$15
\$120	\$0	\$120
\$90	\$250	\$305
\$480	\$0	\$480
\$270	\$0	\$270
\$235	\$0	\$235
\$235	\$0	\$235
\$5	\$0	\$5
\$180	\$0	\$180
\$540	\$0	\$540
\$450	\$0	\$450
\$0	\$0	\$0
\$90	\$0	\$90
\$450	\$250	\$665
\$450	\$250	\$665
\$3,240	\$250	\$3,455
\$270	\$0	\$270
\$810	\$0	\$810
\$90	\$0	\$90
\$900	\$250	\$1,115
\$90	\$250	\$305
\$90	\$250	\$305
\$630	\$0	\$630
\$0	\$0	\$0
\$540	\$250	\$755
\$0	\$0	\$0

Dom	P.Tech, Inc.		LIGHTING UPGRADE PROJECT LINE x LINE DETAIL		JSTOM CILITY				Dunellen Public Schools Lincoln Middle School	FACILITY SQ. FT. 26,248			DA	TE OF AU 1/1/201:		]								
	SPACE	DESCRIPTION								REP	LACEN	MENT FL	XTURES								ENERG	Y ANAL	YSIS	
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS 910	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS 910	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	total annual \$ savings / line (including sensors) <b>\$0.156</b>
35	First Floor	Art Room L1	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	13	62	806	2,200	1,773	Retrofit fixture with (2) LED Tubes	13	40	300	Ceiling	1	520	1,900	1,144	988	22	286	300	629	156	\$122
36	First Floor	Main Entrance Hallway	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	62	248	5,000	1,240	Retrofit fixture with (2) LED Tubes	4	40	0	Ceiling	0	160	5,000	800	800	22	88	0	440	0	\$69
37	First Floor	Main Entrance Hallway	2'x2' Recessed Troffer, Prismatic Lens, w/ (2) FBO32T8/835, 32w 800 Lamps & (1) Electronic Ballast	2	62	124	5,000	620	Retrofit fixture with (2) LED Tubes	2	40	0	Ceiling	0	80	5,000	400	400	22	44	0	220	0	\$34
38	First Floor	Hallway	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	7	62	434	5,000	2,170	Retrofit fixture with (2) LED Tubes	7	40	0	Ceiling	0	280	5,000	1,400	1,400	22	154	0	770	0	\$120
39	First Floor	Classroom L2	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	9	86	776	2,200	1,707	Retrofit fixture with (3) LED Tubes	9	60	300	Ceiling	1	540	1,900	1,188	1,026	26	236	300	519	162	\$106
40	First Floor	Classroom L5	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	12	86	1,034	2,200	2,276	Retrofit fixture with (3) LED Tubes	12	60	300	Ceiling	1	720	1,900	1,584	1,368	26	314	300	692	216	\$142
41	First Floor	Classroom L3	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	9	86	776	2,200	1,707	Retrofit fixture with (3) LED Tubes	9	60	300	Ceiling	1	540	1,900	1,188	1,026	26	236	300	519	162	\$106
42	First Floor	Classroom L4	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	12	86	1,034	2,200	2,276	Retrofit fixture with (3) LED Tubes	12	60	300	Ceiling	1	720	1,900	1,584	1,368	26	314	300	692	216	\$142
43	First Floor	Connecting Bridge	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	345	5,000	1,724	Retrofit fixture with (3) LED Tubes	4	60	0	Ceiling	0	240	5,000	1,200	1,200	26	105	0	524	0	\$82
44	First Floor	Connecting Bridge	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	5,000	862	Retrofit fixture with (3) LED Tubes	2	60	0	Ceiling	0	120	5,000	600	600	26	52	0	262	0	\$41
45	First Floor	Connecting Bridge	2'x2' Recessed Troffer, No Lens, w/ (2) FBO31T8/835, 32w 800 U- Lamps & (1) Electronic Ballast	11	64	700	5,000	3,498	Retrofit fixture with (2) LED U-Tubes	11	52	0	Ceiling	0	572	5,000	2,860	2,860	12	128	0	638	0	\$100
46	First Floor	Electrical Room	4' Fluorescent Strip with (1) F32T8 & (1) Electronic Ballast, Pandant, No Lens	2	35	70	500	35	Retrofit fixture with (1) LED Tube	2	20	0	Ceiling	0	40	500	20	20	15	30	0	15	0	\$2
47	First Floor	Girls Room	Recessed 4ft Strip, Prismatic, w/ (3) F32T8 32w Lamps & (1) Electronic Ballast	2	100	200	2,200	440	Retrofit fixture with (3) LED Tubes	2	60	300	Ceiling	1	120	1,900	264	228	40	80	300	176	36	\$33
48	First Floor	Boys Room	Recessed 4ft Strip, Prismatic, w/ (3) F32T8 32w Lamps & (1) Electronic Ballast	2	100	200	2,200	440	Retrofit fixture with (3) LED Tubes	2	60	300	Ceiling	1	120	1,900	264	228	40	80	300	176	36	\$33
49	Third Floor	Floor 3	2'x4' Recessed Troffer, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	7	62	434	2,200	955	Retrofit fixture with (2) LED Tubes	7	40	0	Ceiling	0	280	2,200	616	616	22	154	0	339	0	\$53
50	Third Floor	Corridor	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	5,000	862	Retrofit fixture with (3) LED Tubes	2	60	0	Ceiling	0	120	5,000	600	600	26	52	0	262	0	\$41
51	Third Floor	Closet	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	500	43	Retrofit fixture with (3) LED Tubes	1	60	0	Ceiling	0	60	500	30	30	26	26	0	13	0	\$2
52	Third Floor	Stairwell	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	8,760	1,510	Retrofit fixture with (3) LED Tubes	2	60	0	Ceiling	0	120	8,760	1,051	1,051	26	52	0	459	0	\$72
53	Second Floor	Stairwell	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	8,760	1,510	Retrofit fixture with (3) LED Tubes	2	60	0	Ceiling	0	120	8,760	1,051	1,051	26	52	0	459	0	\$72
54	First Floor	Stairwell	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	8,760	755	Retrofit fixture with (3) LED Tubes	1	60	0	Ceiling	0	60	8,760	526	526	26	26	0	230	0	\$36
55	Second Floor	Girls Room	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,200	378	Retrofit fixture with (3) LED Tubes	2	60	300	Ceiling	1	120	1,900	264	228	26	52	300	114	36	\$23
56	Second Floor	Boys Room	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	2,200	189	Retrofit fixture with (3) LED Tubes	1	60	300	Ceiling	1	60	1,900	132	114	26	26	300	57	18	\$12
57	Second Floor	Girls Room	2'x2' Recessed Troffer, Prismatic Lens, w/ (2) FBO32T8/835, 32w 800 Lamps & (1) Electronic Ballast	1	62	62	2,200	136	Retrofit fixture with (2) LED Tubes	1	40	300	Ceiling	1	40	1,900	88	76	22	22	300	48	12	\$9
58	Second Floor	Boys Room	2'x2' Recessed Troffer, Prismatic Lens, w/ (2) FBO32T8/835, 32w 800 Lamps & (1) Electronic Ballast	2	62	124	2,200	273	Retrofit fixture with (2) LED Tubes	2	40	300	Ceiling	1	80	1,900	176	152	22	44	300	97	24	\$19
59	Second Floor	High School Link	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	8,760	1,507	Retrofit fixture with (3) LED Tubes	2	60	0	Ceiling	0	120	8,760	1,051	1,051	26	52	0	456	0	\$71
60	Second Floor	Locker Corridor	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	86	258	5,000	1,290	Retrofit fixture with (3) LED Tubes	3	60	0	Ceiling	0	180	5,000	900	900	26	78	0	390	0	\$61
61	Second Floor	Mechanical Room	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pandant, No Lens	2	68	136	500	68	Retrofit fixture with (2) LED Tubes	2	40	0	Ceiling	0	80	500	40	40	28	56	0	28	0	\$4
62	Second Floor	Ramp	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	86	516	5,000	2,580	Retrofit fixture with (3) LED Tubes	6	60	0	Ceiling	0	360	5,000	1,800	1,800	26	156	0	780	0	\$122
63	Second Floor	Ramp	2'x2' Recessed Troffer, Prismatic Lens, w/ (2) FBO32T8/835, 32w 800 Lamps & (1) Electronic Ballast	8	62	496	5,000	2,480	Retrofit fixture with (2) LED Tubes	8	40	0	Ceiling	0	320	5,000	1,600	1,600	22	176	0	880	0	\$137
64	Second Floor	Faculty Bathroom	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	2,200	189	Retrofit fixture with (3) LED Tubes	1	60	300	Ceiling	1	60	1,900	132	114	26	26	300	57	18	\$12
65	Second Floor	Locker Corridor	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	7	62	434	5,000	2,170	Retrofit fixture with (2) LED Tubes	7	40	0	Ceiling	0	280	5,000	1,400	1,400	22	154	0	770	0	\$120
66	Second Floor	Classroom L11	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	12	86	1,034	2,200	2,276	Retrofit fixture with (3) LED Tubes	12	60	300	Ceiling	1	720	1,900	1,584	1,368	26	314	300	692	216	\$142
67	Second Floor	Classroom L12	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	12	86	1,034	2,200	2,276	Retrofit fixture with (3) LED Tubes	12	60	300	Ceiling	1	720	1,900	1,584	1,368	26	314	300	692	216	\$142
68	Second Floor	Classroom L13	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	12	86	1,034	2,200	2,276	Retrofit fixture with (3) LED Tubes	12	60	300	Ceiling	1	720	1,900	1,584	1,368	26	314	300	692	216	\$142

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TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
\$1,170	\$250	\$1,385
\$360	\$0	\$360
\$180	\$0	\$180
\$630	\$0	\$630
\$1,080	\$250	\$1,295
\$1,440	\$250	\$1,655
\$1,080	\$250	\$1,295
\$1,440	\$250	\$1,655
\$480	\$0	\$480
\$240	\$0	\$240
\$1,650	\$0	\$1,650
\$120	\$0	\$120
\$240	\$250	\$455
\$240	\$250	\$455
\$630	\$0	\$560
\$240	\$0	\$180
\$120	\$0	\$90
\$240	\$0	\$180
\$240	\$0	\$180
\$120	\$0	\$90
\$240	\$250	\$395
\$120	\$250	\$305
\$90	\$250	\$285
\$180	\$250	\$355
\$240	\$0	\$180
\$360	\$0	\$270
\$180	\$0	\$140
\$720	\$0	\$540
\$720	\$0	\$560
\$120	\$250	\$305
\$630	\$0	\$490
\$1,440	\$250	\$1,295
\$1,440	\$250	\$1,295
\$1,440	\$250	\$1,295

Dom	e-Tech, Inc.		LIGHTING UPGRADE PROJECT LINE x LINE DETAIL		STOM CILITY				Dunellen Public Schools Lincoln Middle School			FA	CILITY S 26,248			DA	TE OF AU 1/1/2013										
	SPACE I	DESCRIPTION								REF	PLACE	MENT F	IXTURES								ENERG	Y ANAL	YSIS		COS	T ANALYSI	IS
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS 910	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS 910	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS) \$0.156	TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
69	Second Floor	Classroom L10	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	12	86	1,034	2,200	2,276	Retrofit fixture with (3) LED Tubes	12	60	300	Ceiling	1	720	1,900	1,584	1,368	26	314	300	692	216	\$142	\$1,440	\$250	\$1,295
70	Second Floor	Classroom L9	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	14	86	1,207	2,200	2,655	Retrofit fixture with (3) LED Tubes	14	60	300	Ceiling	1	840	1,900	1,848	1,596	26	367	300	807	252	\$165	\$1,680	\$250	\$1,475
71	Second Floor	Closet	Recessed round fixture, No lens w/ (1) 32W Compact Fluorescent Lamp (CFL)	1	32	32	500	16	None	1	32	0	Ceiling	0	32	500	16	16	0	0	0	0	0	\$0	\$0	\$0	\$0
72	Second Floor	Closet	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	62	62	500	31	Retrofit fixture with (2) LED Tubes	1	40	0	Ceiling	0	40	500	20	20	22	22	0	11	0	\$2	\$90	\$0	\$70
73	Second Floor	Classroom L8	Reccesed canopy lighting - 75 incandescent	1	75	75	2,200	165	Relamp 20 Watt LED Screw-in	1	20	300	Ceiling	1	20	1,900	44	38	55	55	300	121	6	\$20	\$20	\$250	\$235
74	Second Floor	Classroom L8	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	2,200	189	Retrofit fixture with (3) LED Tubes	1	60	300	Ceiling	1	60	1,900	132	114	26	26	300	57	18	\$12	\$120	\$250	\$305
75	Second Floor	Classroom L8	75W incandescent	5	75	375	2,200	825	23W CFL	5	23	300	Ceiling	1	115	1,900	253	219	52	260	300	572	35	\$95	\$25	\$250	\$240
76	Second Floor	Classroom L7	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	15	86	1,290	2,200	2,838	Retrofit fixture with (3) LED Tubes	15	60	300	Ceiling	1	900	1,900	1,980	1,710	26	390	300	858	270	\$176	\$1,800	\$250	\$1,565
77	Second Floor	Classroom L14	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	19	62	1,178	2,200	2,592	Retrofit fixture with (2) LED Tubes	19	40	300	Ceiling	1	760	1,900	1,672	1,444	22	418	300	920	228	\$179	\$1,710	\$250	\$1,545
78	Second Floor	Classroom L15	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	62	186	2,200	409	Retrofit fixture with (2) LED Tubes	3	40	300	Ceiling	1	120	1,900	264	228	22	66	300	145	36	\$28	\$270	\$250	\$425
79	Second Floor	Restroom	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	62	62	2,200	136	Retrofit fixture with (2) LED Tubes	1	40	300	Ceiling	1	40	1,900	88	76	22	22	300	48	12	\$9	\$90	\$250	\$285
80	Second Floor	Stairwell	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	62	186	8,760	1,629	Retrofit fixture with (2) LED Tubes	3	40	0	Ceiling	0	120	8,760	1,051	1,051	22	66	0	578	0	\$90	\$270	\$0	\$210
81	First Floor	Stairwell	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	62	248	8,760	2,172	Retrofit fixture with (2) LED Tubes	4	40	0	Ceiling	0	160	8,760	1,402	1,402	22	88	0	771	0	\$120	\$360	\$0	\$280
82	Second Floor	Classroom L16	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	15	86	1,290	2,200	2,838	Retrofit fixture with (3) LED Tubes	15	60	300	Ceiling	1	900	1,900	1,980	1,710	26	390	300	858	270	\$176	\$1,800	\$250	\$1,565
83	Second Floor	Classroom L17	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	86	516	2,200	1,135	Retrofit fixture with (3) LED Tubes	6	60	300	Ceiling	1	360	1,900	792	684	26	156	300	343	108	\$70	\$720	\$250	\$755
84	Second Floor	Classroom L18	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	15	86	1,290	2,200	2,838	Retrofit fixture with (3) LED Tubes	15	60	300	Ceiling	1	900	1,900	1,980	1,710	26	390	300	858	270	\$176	\$1,800	\$250	\$1,565
85	Second Floor	Classroom L19	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	18	86	1,548	2,200	3,406	Retrofit fixture with (3) LED Tubes	18	60	300	Ceiling	1	1,080	1,900	2,376	2,052	26	468	300	1,030	324	\$211	\$2,160	\$250	\$1,835
86	Second Floor	Janitor's Closet	1'x4' Wall Mount, Prismatic Lens with w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast, Wireguard	1	62	62	500	31	Retrofit fixture with (2) LED Tubes	1	40	0	Ceiling	0	40	500	20	20	22	22	0	11	0	\$2	\$90	\$0	\$80
				458		33,373		102,536		456				44	22,107		69,057	63,733		10,978		33,335	5,324	6,031	45,725	11,000	49,015



## LIGHTING RETROFIT SUMMARY FOR: Dunellen High School 411 1st Street, Dunellen, NJ 08812

BUILDING INFORM	ATION	E	EXISTING	FIXTURE	S	Р	ROPOS	ED FIXTUR	ES			S	AVINGS							FINANC	IAL		
BUILDING	SQ. FT.	PRE TOTAL FIXT. QTY	PRE TOTAL FIXT. WATTS	PRE ANNUAL KWH CONSUMPTI ON	PRE WATTS / SQ. FT	POST TOTAL FIXT. QTY	POST TOTAL FIXT. WATTS	POST ANNUAL KWH CONSUMPTION	POST WATTS / SQ. FT	WATTS SAVED	ANNUAL KWH SAVED WITH FIXTURES	ANNUAL KWH SAVED WITH SENSORS	TOTAL ANNUAL KWH SAVED	ANNUAL SAVINGS \$ FIXT.	ANNUAL SAVINGS \$ SENSORS	ANNUAL SAVINGS \$ TOTAL	CO2 REDUCTION (TONS)	FIATURE	NJ Smart Start SENSOR REBATE \$	FIXTURES TOTAL (INSTALLED) COST \$	SENSORS TOTAL (INSTALLED) COST \$	MATERIAL TOTAL (INSTALLED) COST \$	SIMPLE PAYBACK AFTER REBATE (YEARS)
Dunellen High School	77,794	0	80,803	196,585	1.04	805	51,922	128,108	0.67	28,881	68,477	11,905	80,382	\$10,640	\$1,850	\$12,490	22.6	\$26,330	\$4,945	\$102,050	\$23,090	\$125,140	7.5

PERCENTAGE OF REBATES IN TOTAL INSTALLED COST
PERCENTAGE OF CONSUMPTION COMPARE TO EXISTING STATE
EXISTING PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING
PROPOSED PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING

Do	Pre-Tech, Inc.		LIGHTING UPGRADE PROJECT LINE x LINE DETAIL						Dunellen Public Schools Dunellen High School			FAC	ILITY S 77,794				TE OF A 12/31/20	-						
	SPACE	DESCRIPTION								REI	PLACEN	IENT FI	TURES								ENERG	Y ANAL	YSIS	
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	default annual hours 910	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS 910	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS) \$0.155
1	2	3	4 2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700	5	6	7	8	9	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1	Third Floor	Hallway	Lamps & (1) Electronic Ballast	10	107	1,067	5,000	5,335	Retrofit fixture with (4) T8 LED Tubes	10	80	0	Ceiling	0	800	5,000	4,000	4,000	27	267	0	1,335	0	\$207
2	Third Floor	Classroom 201	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	10	62	620	2,200	1,364	Retrofit fixture with (2) T8 LED Tubes	10	40	300	Ceiling	1	400	1,900	880	760	22	220	300	484	120	\$94
3	Third Floor	Art Room 202	8' Pandant strip with matte reflector, No Lens, w/ (4) F32T8/32w 800 Lamps & (1) Electronic Ballast	1	107	107	2,200	235	Retrofit fixture with (4) T8 LED Tubes	1	80	300	Ceiling	1	80	1,900	176	152	27	27	300	59	24	\$13
4	Third Floor	Art Room 202	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	20	107	2,134	2,200	4,695	Retrofit fixture with (4) T8 LED Tubes	20	80	300	Ceiling	1	1,600	1,900	3,520	3,040	27	534	300	1,175	480	\$257
5	Third Floor	AV Closet	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	107	213	500	107	Retrofit fixture with (4) T8 LED Tubes	2	80	0	Ceiling	0	160	500	80	80	27	53	0	27	0	\$4
6	Third Floor	Classroom 203	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	107	640	2,200	1,408	Retrofit fixture with (4) T8 LED Tubes	6	80	300	Ceiling	1	480	1,900	1,056	912	27	160	300	352	144	\$77
7	Third Floor	Classroom 204	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	12	107	1,280	2,200	2,817	Retrofit fixture with (4) T8 LED Tubes	12	80	300	Ceiling	1	960	1,900	2,112	1,824	27	320	300	705	288	\$154
8	Third Floor	Classroom 205	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	12	107	1,280	2,200	2,817	Retrofit fixture with (4) T8 LED Tubes	12	80	300	Ceiling	1	960	1,900	2,112	1,824	27	320	300	705	288	\$154
9	Third Floor	Classroom 206	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	14	107	1,494	2,200	3,286	Retrofit fixture with (4) T8 LED Tubes	14	80	300	Ceiling	1	1,120	1,900	2,464	2,128	27	374	300	822	336	\$180
10	Third Floor	Classroom 207	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	107	107	2,200	235	Retrofit fixture with (4) T8 LED Tubes	1	80	300	Ceiling	1	80	1,900	176	152	27	27	300	59	24	\$13
11	Third Floor	Classroom 208	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	12	107	1,280	2,200	2,817	Retrofit fixture with (4) T8 LED Tubes	12	80	300	Ceiling	1	960	1,900	2,112	1,824	27	320	300	705	288	\$154
12	Third Floor	Girls Room	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	344	2,200	757	Retrofit fixture with (3) T8 LED Tubes	4	60	300	Ceiling	1	240	1,900	528	456	26	104	300	229	72	\$47
13	Third Floor	Boys Room	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	107	213	2,200	469	Retrofit fixture with (4) T8 LED Tubes	2	80	300	Ceiling	1	160	1,900	352	304	27	53	300	117	48	\$26
14	Third Floor	Stairwell	1'x4' Pandant Fixture, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	62	62	8,760	543	Retrofit fixture with (2) T8 LED Tubes	1	40	0	Ceiling	0	40	8,760	350	350	22	22	0	193	0	\$30
15	Second Floor	GYM	400W Metal Halide Fixture with Wireguard	20	460	9,200	2,200	20,240	4 Lamp F54T5HO/ (54W) High Bay Fixture with Wireguard	20	236	300	Ceiling	4	4,720	1,900	10,384	8,968	224	4,480	300	9,856	1,416	\$1,751
16	Third Floor	AV Closet	Wall Mounted-60W incandescent	1	60	60	500	30	23W Screw in CFL	1	18	0	Ceiling	0	18	500	9	9	42	42	0	21	0	\$3
17	Second Floor	Closet	60W incandescent	2	60	120	500	60	23W Screw-in CFL	2	18	0	Ceiling	0	36	500	18	18	42	84	0	42	0	\$7
18	Second Floor	Storage	60W incandescent	1	60	60	500	30	23W Screw-in CFL	1	18	0	Ceiling	0	18	500	9	9	42	42	0	21	0	\$3
19	Second Floor	GYM Loft	60W incandescent	5	60	300	500	150	23W Screw-in CFL	5	18	0	Ceiling	0	90	500	45	45	42	210	0	105	0	\$16
20	Second Floor	GYM Loft	8' Pandant Mount, Prismatic Lens, w/ (2) F96T12/95w Lamps & (1) Magnetic Ballast	5	142	708	500	354	Retrofit fixture with (2) T8 LED Tubes	5	40	0	Ceiling	0	200	500	100	100	102	508	0	254	0	\$39
21	Second Floor	Boys Locker Room	Recessed 4ft Strip, Prismatic, w/ (4) F32T8/32w Lamps & (1) Electronic Ballast	4	131	524	2,200	1,153	Retrofit fixture with (4) T8 LED Tubes	4	80	0	Wall	0	320	2,200	704	704	51	204	0	449	0	\$70
22	Second Floor	Office	1'x4' Surface Fixture, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	62	62	2,200	136	Retrofit fixture with (2) T8 LED Tubes	1	40	300	Wall	1	40	1,900	88	76	22	22	300	48	12	\$9
23	Second Floor	Office	1'x4' Surface Fixture, Prismatic Lens, w/ (2) F32T8/32w 700	1	62	62	2,200	136	Retrofit fixture with (2) T8 LED Tubes	1	40	300	Wall	1	40	1,900	88	76	22	22	300	48	12	\$9
24	Second Floor	Office	Lamps & (1) Electronic Ballast Recessed 4ft Strip, Prismatic, w/ (4) F32T8/32w Lamps & (1)	1	131	131	2,200	288	Retrofit fixture with (4) T8 LED Tubes	1	80	300	Wall	1	80	1,900	176	152	51	51	300	112	24	\$21
25	Second Floor	Office	Electronic Ballast 1'x4' Surface Fixture, No Lens, w/ (2) F32T8/32w 700 Lamps & (1)	1	62	62	2,200	136	Retrofit fixture with (2) T8 LED Tubes	1	40	300	Wall	1	40	1,900	88	76	22	22	300	48	12	\$9
26	Second Floor	Girls Locker Room Stairs	Electronic Ballast 1'x4' Surface Fixture, Prismatic Lens, w/ (2) F32T8/32w 700	1	62	62	2,200	136	Retrofit fixture with (2) T8 LED Tubes	1	40	0	Ceiling	0	40	2,200	88	88	22	22	0	48	0	\$8
20	Second Floor	Classroom 101	Lamps & (1) Electronic Ballast 2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700	9	107	960	2,200	2,113	Retrofit fixture with (4) T8 LED Tubes	9	80	300	Ceiling	1	720	1,900	1,584	1,368	22	240	300	529	216	\$116
27	Second Floor	Classroom 102	Lamps & (1) Electronic Ballast 2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700	3	107		2,200	704	Retrofit fixture with (4) T8 LED Tubes		80	300	Ceiling	1	240	1,900	528	456	27	80	300	176	72	\$39
_		Classroom 102	Lamps & (1) Electronic Ballast 2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700			320				3			-	4										
29	Second Floor		Lamps & (1) Electronic Ballast 2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700	9	107	960	2,200	2,113	Retrofit fixture with (4) T8 LED Tubes	-	80	300	Ceiling		720	1,900	1,584	1,368	27	240	300	529	216	\$116
30	Second Floor	Classroom 104	Lamps & (1) Electronic Ballast	9	107	960	2,200	2,113	Retrofit fixture with (4) T8 LED Tubes	9	80	300	Ceiling	1	720	1,900	1,584	1,368	27	240	300	529	216	\$116
31	Second Floor	Closet	60W incandescent 2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700	2	60	120	500	60	23W Screw-in CFL	2	18	0	Ceiling	0	36	500	18	18	42	84	0	42	0	\$7
32	Second Floor	Girls Room	Lamps & (1) Electronic Ballast	2	107	213	2,200	469	Retrofit fixture with (4) T8 LED Tubes	2	80	300	Ceiling	1	160	1,900	352	304	27	53	300	117	48	\$26
33	Second Floor	Classroom 105	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	9	107	960	2,200	2,113	Retrofit fixture with (4) T8 LED Tubes	9	80	300	Ceiling	1	720	1,900	1,584	1,368	27	240	300	529	216	\$116
34	Second Floor	Classroom 106	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	107	640	2,200	1,408	Retrofit fixture with (4) T8 LED Tubes	6	80	300	Ceiling	1	480	1,900	1,056	912	27	160	300	352	144	\$77

TOTAL SENSOR PLUS LATERNAL PLUS LATERNAL PLUS AFTER SOCY AFTER A	COS		S
\$1,500\$0\$1,100\$900\$250\$915\$150\$250\$325\$3,000\$250\$2,415\$300\$250\$2,415\$300\$250\$875\$1,800\$250\$1,535\$1,800\$250\$1,535\$1,800\$250\$1,535\$1,800\$250\$1,535\$1,800\$250\$1,535\$1,800\$250\$1,535\$1,800\$250\$1,535\$1,800\$250\$1,535\$480\$250\$1,535\$300\$250\$435\$300\$250\$435\$480\$250\$435\$300\$250\$435\$480\$0\$10\$5\$0\$5\$10\$0\$10\$5\$0\$25\$10\$0\$10\$5\$0\$25\$450\$0\$350\$450\$120\$170\$90\$120\$170\$90\$120\$170\$90\$120\$170\$90\$120\$170\$90\$120\$170\$90\$120\$170\$90\$120\$170\$90\$120\$170\$1,350\$250\$1,205\$1,350\$250\$1,205\$1,350\$250\$1,205\$1,350\$250\$435\$1,350\$250\$1,205\$1,350\$250\$1,205\$1,350\$250\$1,205<	COST (MATERIAL PLUS LABOR)	COST (MATERIAL PLUS LABOR)	INSTALLED COST AFTER INCENTIVES
Nome         Nome           \$900         \$250         \$915           \$150         \$250         \$325           \$3,000         \$250         \$2,415           \$300         \$0         \$220           \$300         \$250         \$875           \$300         \$250         \$1,535           \$1,800         \$250         \$1,535           \$1,800         \$250         \$1,535           \$2,100         \$250         \$1,535           \$1,800         \$250         \$1,535           \$1,800         \$250         \$1,535           \$1,800         \$250         \$1,535           \$1,800         \$250         \$1,535           \$480         \$250         \$1,535           \$480         \$250         \$1,535           \$480         \$250         \$1,535           \$300         \$250         \$1,535           \$480         \$250         \$1,535           \$480         \$250         \$1,535           \$5         \$0         \$5           \$10         \$1,000         \$6,440           \$5         \$0         \$25           \$25         \$0         \$250			
Nome         Nome           \$150         \$250         \$325           \$3,000         \$250         \$2,415           \$300         \$0         \$220           \$900         \$250         \$1,535           \$1,800         \$250         \$1,535           \$1,800         \$250         \$1,535           \$1,800         \$250         \$1,535           \$2,100         \$250         \$1,535           \$1,800         \$250         \$1,535           \$1,800         \$250         \$1,535           \$150         \$250         \$1,535           \$180         \$250         \$1,535           \$10         \$250         \$1,535           \$300         \$250         \$1,535           \$300         \$250         \$1,535           \$300         \$250         \$1,535           \$300         \$250         \$435           \$90         \$1,000         \$6,440           \$5         \$0         \$5           \$10         \$0         \$10           \$5         \$0         \$25           \$25         \$0         \$25           \$25         \$0         \$250 <t< td=""><td>\$1,500</td><td>\$0</td><td>\$1,100</td></t<>	\$1,500	\$0	\$1,100
No.         No.           \$3,000         \$250         \$2,415           \$300         \$0         \$220           \$900         \$250         \$875           \$1,800         \$250         \$1,535           \$1,800         \$250         \$1,535           \$2,100         \$250         \$1,535           \$1,800         \$250         \$1,535           \$1,800         \$250         \$1,535           \$1,800         \$250         \$1,535           \$10         \$250         \$1,535           \$480         \$250         \$1,535           \$480         \$250         \$1,535           \$300         \$250         \$435           \$300         \$250         \$435           \$90         \$10         \$70           \$8,000         \$1,000         \$6,440           \$91         \$0         \$10           \$5         \$0         \$25           \$10         \$0         \$10           \$5         \$0         \$25           \$10         \$0         \$10           \$25         \$0         \$25           \$10         \$120         \$170	\$900	\$250	\$915
No.         No.           \$300         \$0         \$220           \$900         \$250         \$875           \$1,800         \$250         \$1,535           \$1,800         \$250         \$1,535           \$2,100         \$250         \$1,535           \$1,800         \$250         \$1,535           \$150         \$250         \$1,535           \$150         \$250         \$1,535           \$150         \$250         \$1,535           \$1800         \$250         \$1,535           \$150         \$250         \$1,535           \$180         \$250         \$1,535           \$180         \$250         \$1,535           \$480         \$250         \$435           \$90         \$10         \$10           \$8,000         \$1,000         \$6,440           \$90         \$10         \$10           \$5         \$0         \$25           \$10         \$0         \$10           \$5         \$0         \$25           \$450         \$0         \$170           \$90         \$120         \$170           \$90         \$120         \$170	\$150	\$250	\$325
Nome         Nome           \$900         \$250         \$875           \$1,800         \$250         \$1,535           \$1,800         \$250         \$1,535           \$2,100         \$250         \$1,755           \$150         \$250         \$1,535           \$150         \$250         \$1,535           \$1800         \$250         \$1,535           \$1800         \$250         \$1,535           \$480         \$250         \$1,535           \$480         \$250         \$1,535           \$480         \$250         \$1,535           \$480         \$250         \$1,535           \$480         \$250         \$1,535           \$480         \$250         \$435           \$90         \$0         \$70           \$8,000         \$1,000         \$6,440           \$5         \$0         \$5           \$10         \$0         \$10           \$5         \$0         \$25           \$450         \$0         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170	\$3,000	\$250	\$2,415
Nome         Nome           \$1,800         \$250         \$1,535           \$1,800         \$250         \$1,535           \$2,100         \$250         \$1,755           \$150         \$250         \$1,535           \$150         \$250         \$1,535           \$150         \$250         \$1,535           \$1800         \$250         \$1,535           \$480         \$250         \$1,535           \$300         \$250         \$1,535           \$300         \$250         \$435           \$90         \$250         \$435           \$90         \$10         \$70           \$8,000         \$1,000         \$6,440           \$5         \$0         \$5           \$10         \$0         \$10           \$5         \$0         \$5           \$10         \$0         \$10           \$25         \$0         \$25           \$450         \$0         \$250           \$450         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90 <td>\$300</td> <td>\$0</td> <td>\$220</td>	\$300	\$0	\$220
\$1,800         \$250         \$1,535           \$2,100         \$250         \$1,755           \$150         \$250         \$325           \$150         \$250         \$1,535           \$480         \$250         \$1,535           \$480         \$250         \$1,535           \$300         \$250         \$435           \$300         \$250         \$435           \$90         \$0         \$70           \$8,000         \$1,000         \$6,440           \$5         \$0         \$5           \$10         \$0         \$10           \$5         \$0         \$10           \$5         \$0         \$10           \$10         \$0         \$10           \$5         \$0         \$25           \$10         \$0         \$10           \$10         \$0         \$10           \$25         \$0         \$25           \$450         \$0         \$250           \$100         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170      \$1,350 <t< td=""><td>\$900</td><td>\$250</td><td>\$875</td></t<>	\$900	\$250	\$875
S2,100         S250         S1,755           \$150         \$250         \$325           \$1,800         \$250         \$1,535           \$480         \$250         \$1,535           \$480         \$250         \$435           \$300         \$250         \$435           \$90         \$0         \$70           \$8,000         \$1,000         \$6,440           \$5         \$0         \$5           \$10         \$0         \$10           \$10         \$0         \$10           \$10         \$0         \$10           \$25         \$0         \$25           \$450         \$0         \$10           \$450         \$0         \$25           \$450         \$0         \$25           \$450         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$250         \$1,205           \$1,350<	\$1,800	\$250	\$1,535
\$150         \$250         \$325           \$1,800         \$250         \$1,535           \$480         \$250         \$1,535           \$300         \$250         \$435           \$300         \$250         \$435           \$90         \$0         \$70           \$8,000         \$1,000         \$6,440           \$5         \$0         \$51           \$10         \$0         \$10           \$5         \$0         \$51           \$10         \$0         \$10           \$5         \$0         \$51           \$10         \$0         \$10           \$5         \$0         \$10           \$10         \$0         \$10           \$10         \$0         \$10           \$25         \$0         \$25           \$450         \$0         \$10           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$1350         \$250<	\$1,800	\$250	\$1,535
No.         No.           \$1,800         \$250         \$1,535           \$480         \$250         \$575           \$300         \$250         \$435           \$90         \$0         \$70           \$8,000         \$1,000         \$6,440           \$5         \$0         \$51           \$10         \$0         \$10           \$5         \$0         \$51           \$10         \$0         \$10           \$5         \$0         \$51           \$10         \$0         \$10           \$5         \$0         \$51           \$10         \$0         \$10           \$5         \$0         \$51           \$25         \$0         \$25           \$450         \$0         \$120           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$10           \$1,350         \$250         \$1,205 <td>\$2,100</td> <td>\$250</td> <td>\$1,755</td>	\$2,100	\$250	\$1,755
\$480         \$250         \$575           \$300         \$250         \$435           \$90         \$0         \$70           \$8,000         \$1,000         \$6,440           \$5         \$0         \$5           \$10         \$0         \$10           \$5         \$0         \$10           \$5         \$0         \$10           \$5         \$0         \$10           \$5         \$0         \$10           \$5         \$0         \$10           \$5         \$0         \$10           \$5         \$0         \$10           \$60         \$0         \$25           \$450         \$0         \$350           \$600         \$0         \$440           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$1350         \$250         \$1,205           \$1,350         \$250	\$150	\$250	\$325
Nome         Nome           \$300         \$250         \$435           \$90         \$0         \$70           \$8,000         \$1,000         \$6,440           \$5         \$0         \$5           \$10         \$0         \$10           \$5         \$0         \$10           \$5         \$0         \$10           \$5         \$0         \$10           \$5         \$0         \$10           \$5         \$0         \$10           \$5         \$0         \$5           \$450         \$0         \$25           \$450         \$0         \$350           \$600         \$0         \$440           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$0         \$70           \$150         \$120         \$1,205           \$1,350         \$250         \$1,205           \$1,350         \$250         \$1,205           \$10         \$0         \$10      \$300         \$250         \$435 <td>\$1,800</td> <td>\$250</td> <td>\$1,535</td>	\$1,800	\$250	\$1,535
\$90         \$0         \$70           \$8,000         \$1,000         \$6,440           \$5         \$0         \$5           \$10         \$0         \$10           \$5         \$0         \$10           \$5         \$0         \$10           \$5         \$0         \$10           \$5         \$0         \$10           \$5         \$0         \$25           \$450         \$0         \$350           \$600         \$0         \$440           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$250         \$1,205           \$1,350         \$250         \$1,205           \$1,350         \$250         \$1,205      \$10         \$0	\$480	\$250	\$575
Nome         Nome           \$8,000         \$1,000         \$6,440           \$5         \$0         \$5           \$10         \$0         \$10           \$50         \$10         \$5           \$10         \$0         \$10           \$5         \$0         \$5           \$25         \$0         \$25           \$450         \$0         \$350           \$600         \$0         \$440           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$1350         \$250         \$1,205           \$1,350         \$250         \$1,205           \$10         \$0         \$10      \$300         \$250         \$435	\$300	\$250	\$435
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No         No           \$10         \$0         \$10           \$5         \$0         \$5           \$25         \$0         \$25           \$450         \$0         \$350           \$600         \$0         \$350           \$600         \$0         \$440           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$0         \$10           \$1350         \$250         \$1,205           \$1,350         \$250         \$1,205           \$10         \$0         \$10           \$300         \$250         \$435           \$1,350         \$250         \$1,205	\$8,000	\$1,000	\$6,440
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\$25         \$0         \$25           \$450         \$0         \$350           \$600         \$0         \$440           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$150         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$0         \$120           \$1,350         \$250         \$1,205           \$10         \$0         \$10           \$300         \$250         \$435           \$1,350         \$250         \$1,205	\$10	\$0	\$10
\$450         \$0         \$350           \$600         \$0         \$440           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$1205           \$1,350         \$250         \$1,205           \$10         \$0         \$10           \$300         \$250         \$435           \$1,350         \$250         \$1,205	\$5	\$0	\$5
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\$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$150         \$120         \$210           \$90         \$120         \$210           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$0         \$170           \$90         \$0         \$170           \$90         \$0         \$170           \$90         \$0         \$170           \$1,350         \$250         \$1,205           \$10         \$0         \$10           \$300         \$250         \$435           \$1,350         \$250         \$1,205	\$450	\$0	\$350
\$90         \$120         \$170           \$150         \$120         \$210           \$150         \$120         \$210           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$120         \$170           \$90         \$0         \$70           \$1,350         \$250         \$1,205           \$1,350         \$250         \$1,205           \$1,350         \$250         \$1,205           \$1,350         \$250         \$1,205           \$10         \$0         \$10           \$300         \$250         \$1,205           \$1,350         \$250         \$1,205           \$10         \$0         \$10           \$300         \$250         \$1,205           \$1,350         \$250         \$1,205	\$600	\$0	\$440
\$150         \$120         \$210           \$90         \$120         \$170           \$90         \$0         \$170           \$90         \$0         \$70           \$1,350         \$250         \$1,205           \$450         \$250         \$1,205           \$1,350         \$250         \$1,205           \$1,350         \$250         \$1,205           \$1,350         \$250         \$1,205           \$1,350         \$250         \$1,205           \$10         \$0         \$10           \$300         \$250         \$435           \$1,350         \$250         \$1,205	\$90	\$120	\$170
\$90         \$120         \$170           \$90         \$0         \$70           \$1,350         \$250         \$1,205           \$450         \$250         \$1,205           \$1,350         \$250         \$1,205           \$1,350         \$250         \$1,205           \$1,350         \$250         \$1,205           \$1,350         \$250         \$1,205           \$10         \$0         \$10           \$300         \$250         \$435           \$1,350         \$250         \$1,205	\$90	\$120	\$170
\$90         \$0         \$70           \$1,350         \$250         \$1,205           \$450         \$250         \$1,205           \$1,350         \$250         \$1,205           \$1,350         \$250         \$1,205           \$1,350         \$250         \$1,205           \$1,350         \$250         \$1,205           \$10         \$0         \$10           \$300         \$250         \$435           \$1,350         \$250         \$1,205	\$150	\$120	\$210
\$1,350         \$250         \$1,205           \$450         \$250         \$545           \$1,350         \$250         \$1,205           \$1,350         \$250         \$1,205           \$1,350         \$250         \$1,205           \$1,350         \$250         \$1,205           \$10         \$0         \$10           \$300         \$250         \$435           \$1,350         \$250         \$1,205	\$90	\$120	\$170
\$450         \$250         \$545           \$1,350         \$250         \$1,205           \$1,350         \$250         \$1,205           \$1,350         \$250         \$1,205           \$10         \$0         \$10           \$300         \$250         \$435           \$1,350         \$250         \$1,205	\$90	\$0	\$70
\$1,350         \$250         \$1,205           \$1,350         \$250         \$1,205           \$1,350         \$250         \$1,205           \$10         \$0         \$10           \$300         \$250         \$435           \$1,350         \$250         \$1,205	\$1,350	\$250	\$1,205
\$1,350         \$250         \$1,205           \$10         \$0         \$10           \$300         \$250         \$435           \$1,350         \$250         \$1,205	\$450	\$250	\$545
\$10         \$0         \$10           \$300         \$250         \$435           \$1,350         \$250         \$1,205	\$1,350	\$250	\$1,205
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	\$900	\$250	\$875

Do	ne-Tech, Inc.		LIGHTING UPGRADE PROJECT LINE x LINE DETAIL		JSTOM CILITY				Dunellen Public Schools Dunellen High School			FAC	ILITY S 77,794				TE OF A 12/31/20	-	]					
	SPACE I	DESCRIPTION								REF	PLACEN	MENT FI)	TURES								ENERG	Y ANAL	YSIS	
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS 910	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS 910	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS) \$0.155
35	Second Floor	Classroom 107	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	107	640	2,200	1,408	Retrofit fixture with (4) T8 LED Tubes	6	80	300	Ceiling	1	480	1,900	1,056	912	27	160	300	352	144	\$77
36	Second Floor	Classroom 108	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	107	107	2,200	235	Retrofit fixture with (4) T8 LED Tubes	1	80	300	Ceiling	1	80	1,900	176	152	27	27	300	59	24	\$13
37	Second Floor	Weight Room	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	10	107	1,067	2,200	2,347	Retrofit fixture with (4) T8 LED Tubes	10	80	300	Ceiling	1	800	1,900	1,760	1,520	27	267	300	587	240	\$129
38	Second Floor	Computer Lab	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	9	86	776	2,200	1,707	Retrofit fixture with (3) T8 LED Tubes	9	60	300	Ceiling	1	540	1,900	1,188	1,026	26	236	300	519	162	\$106
39	Second Floor	Typing Room	1'x4' Surface Fixture with matte reflector, Prismatic Lens, w/ (4) F32T8/32w 800 Lamps & (1) Electronic Ballast	16	107	1,707	2,200	3,756	Retrofit fixture with (4) T8 LED Tubes	16	80	300	Ceiling	1	1,280	1,900	2,816	2,432	27	427	300	940	384	\$206
40	Second Floor	Main Office	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	107	640	2,200	1,408	Retrofit fixture with (4) T8 LED Tubes	6	80	300	Wall	1	480	1,900	1,056	912	27	160	300	352	144	\$77
41	Second Floor	Office 1	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	107	213	2,200	469	Retrofit fixture with (4) T8 LED Tubes	2	80	300	Wall	1	160	1,900	352	304	27	53	300	117	48	\$26
42	Second Floor	Office 2	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	107	213	2,200	469	Retrofit fixture with (4) T8 LED Tubes	2	80	300	Wall	1	160	1,900	352	304	27	53	300	117	48	\$26
43	Second Floor	Office 3	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	107	213	2,200	469	Retrofit fixture with (4) T8 LED Tubes	2	80	300	Wall	1	160	1,900	352	304	27	53	300	117	48	\$26
44	Second Floor	Office 4	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	107	213	2,200	469	Retrofit fixture with (4) T8 LED Tubes	2	80	300	Wall	1	160	1,900	352	304	27	53	300	117	48	\$26
45	Second Floor	Office 5	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	107	213	2,200	469	Retrofit fixture with (4) T8 LED Tubes	2	80	300	Wall	1	160	1,900	352	304	27	53	300	117	48	\$26
46	Second Floor	Office 6	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	107	427	2,200	939	Retrofit fixture with (4) T8 LED Tubes	4	80	300	Wall	1	320	1,900	704	608	27	107	300	235	96	\$51
47	Second Floor	Room 6	60W incandescent	4	60	240	2,200	528	23W Screw-in CFL	4	18	300	Ceiling	1	72	1,900	158	137	42	168	300	370	22	\$61
48	Second Floor	Stairwell	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	107	213	8,760	1,869	Retrofit fixture with (4) T8 LED Tubes	2	80	0	Ceiling	0	160	8,760	1,402	1,402	27	53	0	468	0	\$73
49	Second Floor	Auditorium	60W incandescent	3	60	180	500	90	23W Screw-in CFL	3	18	300	Ceiling	1	54	200	27	11	42	126	300	63	16	\$12
50	Second Floor	Auditorium	Surface Mount 400W Metal Halide Fixture with Prismatic Lens (Auditorium)	9	460	4,140	500	2,070	4 Lamp F54T5HO/ (54W) High Bay Fixture	9	236	300	Ceiling	4	2,124	200	1,062	425	224	2,016	300	1,008	637	\$256
51	Second Floor	Library	1'x4' Surface Fixture, No Lens, w/ (2) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	24	66	1,584	2,200	3,485	Retrofit fixture with (2) T8 LED Tubes	24	40	300	Ceiling	3	960	1,900	2,112	1,824	26	624	300	1,373	288	\$258
52	Second Floor	Library - Stacks	2'x4' Surface Fixture, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	107	640	2,200	1,408	Retrofit fixture with (4) T8 LED Tubes	6	80	300	Ceiling	2	480	1,900	1,056	912	27	160	300	352	144	\$77
53	Second Floor	Library - Stacks	2'x2' Recessed Troffer, Prismatic Lens, w/ (2) FBO32T8/835, 32w 800 Lamps & (1) Electronic Ballast	6	62	372	2,200	818	Retrofit fixture with (2) T8 LED Tubes	6	40	300	Ceiling	2	240	1,900	528	456	22	132	300	290	72	\$56
54	Second Floor	Computer Room	2'x2' Recessed Troffer, Prismatic Lens, w/ (2) F20T12/20w Lamps & (1) Magnetic Ballast	4	42	166	2,200	366	Retrofit fixture with (2) T8 LED Tubes	4	40	300	Ceiling	1	160	1,900	352	304	2	6	300	14	48	\$10
55	Second Floor	Office A	1'x4' Surface Fixture, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	62	248	2,200	546	Retrofit fixture with (2) T8 LED Tubes	4	40	300	Wall	1	160	1,900	352	304	22	88	300	194	48	\$38
56	Second Floor	Office B	2'x2' Recessed Troffer, Prismatic Lens, w/ (2) F20T12/20w Lamps & (1) Magnetic Ballast	1	42	42	2,200	92	Retrofit fixture with (2) T8 LED Tubes	1	40	300	Wall	1	40	1,900	88	76	2	2	300	4	12	\$2
57	Second Floor	Corridor	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	8	107	854	5,000	4,268	Retrofit fixture with (4) T8 LED Tubes	8	80	0	Ceiling	0	640	5,000	3,200	3,200	27	214	0	1,068	0	\$166
58	Second Floor	Classroom 113	2'x4' Surface Fixture, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	62	372	2,200	818	Retrofit fixture with (2) T8 LED Tubes	6	40	300	Ceiling	1	240	1,900	528	456	22	132	300	290	72	\$56
59	Second Floor	Boys Room	1'x4' Surface Fixture, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	62	186	2,200	409	Retrofit fixture with (2) T8 LED Tubes	3	40	300	Ceiling	1	120	1,900	264	228	22	66	300	145	36	\$28
60	Second Floor	Quiet Room	1'x4' Surface Fixture with matte reflector, Prismatic Lens, w/ (4) F32T8/32w 800 Lamps & (1) Electronic Ballast	1	107	107	2,200	235	Retrofit fixture with (4) T8 LED Tubes	1	80	300	Ceiling	1	80	1,900	176	152	27	27	300	59	24	\$13
61	Second Floor	Girls Room	1'x4' Surface Fixture, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	62	186	2,200	409	Retrofit fixture with (2) T8 LED Tubes	3	40	300	Ceiling	1	120	1,900	264	228	22	66	300	145	36	\$28
62	Second Floor	Quiet Room	1'x4' Surface Fixture, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	62	62	2,200	136	Retrofit fixture with (2) T8 LED Tubes	1	40	300	Ceiling	1	40	1,900	88	76	22	22	300	48	12	\$9
63	Second Floor	Classroom 114	1'x4' Surface Fixture with matte reflector, Prismatic Lens, w/ (4) F32T8/32w 800 Lamps & (1) Electronic Ballast	11	107	1,174	2,200	2,582	Retrofit fixture with (4) T8 LED Tubes	11	80	300	Ceiling	1	880	1,900	1,936	1,672	27	294	300	646	264	\$141
64	Second Floor	West Wing Stairwell	1'x4' Recessed Fixture with matte reflector, Prismatic Lens, w/ (4) F32T8/32w 800 Lamps & (1) Electronic Ballast	3	108	323	8,760	2,830	Retrofit fixture with (4) T8 LED Tubes	3	80	0	Ceiling	0	240	8,760	2,102	2,102	28	83	0	728	0	\$113
65	First Floor	Music Room	1'x4' Surface Fixture, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	25	62	1,550	2,200	3,410	Retrofit fixture with (2) T8 LED Tubes	25	40	300	Ceiling	1	1,000	1,900	2,200	1,900	22	550	300	1,210	300	\$235
66	First Floor	Office A	2'x2' Recessed Troffer, Prismatic Lens, w/ (2) FBO32T8/835, 32w 800 Lamps & (1) Electronic Ballast	2	62	124	2,200	273	Retrofit fixture with (2) T8 LED Tubes	2	40	300	Wall	1	80	1,900	176	152	22	44	300	97	24	\$19
67	First Floor	Office B	60W incandescent	1	60	60	2,200	132	23W Screw-in CFL	1	18	300	Wall	1	18	1,900	40	34	42	42	300	92	5	\$15
68	First Floor	Bathroom	60W incandescent	2	60	120	2,200	264	23W Screw-in CFL	2	18	300	Ceiling	1	36	1,900	79	68	42	84	300	185	11	\$30

COS		S
TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
\$900	\$250	\$875
\$150	\$250	\$325
\$1,500	\$250	\$1,315
\$1,080	\$250	\$1,025
\$2,400	\$250	\$1,975
\$900	\$120	\$760
\$300	\$120	\$320
\$300	\$120	\$320
\$300	\$120	\$320
\$300	\$120	\$320
\$300	\$120	\$320
\$600	\$120	\$540
\$20	\$250	\$235
\$300	\$0	\$220
\$15	\$250	\$230
\$3,600	\$1,000	\$3,140
\$2,160	\$750	\$2,115
\$900	\$500	\$1,020
\$540	\$500	\$780
\$360	\$250	\$495
\$360	\$120	\$380
\$90	\$120	\$170
\$1,200	\$0	\$880
\$540	\$250	\$635
\$270	\$250	\$425
\$150	\$250	\$325
\$270	\$250	\$425
\$90	\$250	\$285
\$1,650	\$250	\$1,425
\$450	\$0	\$330
\$2,250	\$250	\$1,965
\$180	\$120	\$240
\$5	\$120	\$105
\$10	\$250	\$225

Do	ne-Tech, Inc.		LIGHTING UPGRADE PROJECT LINE x LINE DETAIL		JSTOM ACILITY				Dunellen Public Schools Dunellen High School			FAC	ILITY S 77,794				E OF AU 2/31/201		]								
	SPACE	DESCRIPTION								REP	LACE	MENT FI	KTURES							EN	ERGY	ANALY	SIS		COS	T ANALYS	IS
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS 910	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	TOTAL H WATTS	ANNUAL HOURS 910	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	SAVED HO	URS S VED F	KWH SAVED FROM	NNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS) \$0.155	TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
69	First Floor	Office C	1'x4' Surface Fixture, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	62	62	2,200	136	Retrofit fixture with (2) T8 LED Tubes	1	40	300	Wall	1	40	1,900	88	76	22	22 3	00	48	12	\$9	\$90	\$120	\$170
70	First Floor	Custodian	60W incandescent	1	60	60	500	30	23W Screw-in CFL	1	18	0	Ceiling	0	18	500	9	9	42	42	D	21	0	\$3	\$5	\$0	\$5
71	First Floor	Faculty Room	2'x4' Surface Fixture, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	9	107	960	2,200	2,113	Retrofit fixture with (4) T8 LED Tubes	9	80	300	Ceiling	1	720	1,900	1,584	1,368	27	240 3	00	529	216	\$116	\$1,350	\$250	\$1,205
72	First Floor	Bathroom	Recessed round fixture w/ prismatic lens w/ (2) 14W Compact Fluorescent Lamp (CFL)	2	28	56	2,200	123	None	2	28	300	Ceiling	1	56	1,900	123	106	0	0 3	00	0	17	\$3	\$0	\$250	\$215
73	First Floor	Kitchen	1'x4' Surface Fixture, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	20	62	1,240	2,200	2,728	Retrofit fixture with (2) T8 LED Tubes	20	40	0	Ceiling	0	800	2,200	1,760	1,760	22	440	0	968	0	\$150	\$1,800	\$0	\$1,400
74	First Floor	Kitchen Office	1'x4' Surface Mount, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	1	144	144	2,200	317	Retrofit fixture with (4) T8 LED Tubes	1	80	300	Wall	1	80	1,900	176	152	64	64 3	00	141	24	\$26	\$150	\$120	\$210
75	First Floor	Bathroom	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	107	107	2,200	235	Retrofit fixture with (4) T8 LED Tubes	1	80	300	Ceiling	1	80	1,900	176	152	27	27 3	00	59	24	\$13	\$150	\$250	\$325
76	First Floor	Storage	1'x4' Surface Fixture, No Lens, w/ (2) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	1	66	66	500	33	Retrofit fixture with (2) T8 LED Tubes	1	40	0	Ceiling	0	40	500	20	20	26	26	D	13	0	\$2	\$90	\$0	\$70
77	First Floor	Cafeteria	2'x4' Surface Mount, Prismatic Lens, w/ (4) F40T12/34w Lamps & (1) Magnetic Ballast	24	144	3,456	2,200	7,603	Retrofit fixture with (4) T8 LED Tubes	24	80	300	Ceiling	2	1,920	1,900	4,224	3,648	64	1,536 3	00 3	3,379	576	\$615	\$3,600	\$500	\$3,000
78	First Floor	Kitchen	60W incandescent	4	60	240	2,200	528	23W Screw-in CFL	4	18	0	Ceiling	0	72	2,200	158	158	42	168	) :	370	0	\$57	\$20	\$0	\$20
79	First Floor	Auditorium	9 Watt Compact Fluorescent	34	9	306	500	153	None	34	9	0	Ceiling	0	306	500	153	153	0	0	D	0	0	\$0	\$0	\$0	\$0
80	First Floor	Stage	60W incandescent	2	60	120	500	60	23W Screw-in CFL	2	18	0	Ceiling	0	36	500	18	18	42	84	D	42	0	\$7	\$10	\$0	\$10
81	First Floor	Stage	4' Pandant Fixture, No Lens, w/ (2) F40T12/34w Lamp & (1) Energy Saving Magnetic Ballast	8	75	600	500	300	Retrofit fixture with (2) T8 LED Tubes	8	40	0	Ceiling	0	320	500	160	160	35	280	D	140	0	\$22	\$720	\$0	\$560
82	First Floor	Auditorium Entry	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	11	62	682	500	341	Retrofit fixture with (2) T8 LED Tubes	11	40	0	Ceiling	0	440	500	220	220	22	242	D	121	0	\$19	\$990	\$0	\$770
83	First Floor	Stairwell Library	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	107	320	8,760	2,804	Retrofit fixture with (4) T8 LED Tubes	3	80	0	Ceiling	0	240	8,760	2,102	2,102	27	80	о <sup>.</sup>	702	0	\$109	\$450	\$0	\$330
84	First Floor	Classroom 5	2'x4' Surface Fixture, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	12	62	744	2,200	1,637	Retrofit fixture with (3) T8 LED Tubes	12	60	300	Ceiling	1	720	1,900	1,584	1,368	2	24 3	00	53	216	\$42	\$1,440	\$250	\$1,295
85	First Floor	Woodshop Room 5	1'x4' Surface Fixture, No Lens, w/ (2) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	58	66	3,828	2,200	8,422	Retrofit fixture with (2) T8 LED Tubes	58	40	0	Ceiling	0	2,320	2,200	5,104	5,104	26	1,508	) 3	3,318	0	\$515	\$5,220	\$0	\$4,060
86	First Floor	Classroom 4	2'x4' Surface Fixture, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	12	62	744	2,200	1,637	Retrofit fixture with (3) T8 LED Tubes	12	60	300	Ceiling	1	720	1,900	1,584	1,368	2	24 3	00	53	216	\$42	\$1,440	\$250	\$1,295
87	First Floor	Stairwell	1'x4' Pandant Fixture, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	62	248	8,760	2,172	Retrofit fixture with (2) T8 LED Tubes	4	40	0	Ceiling	0	160	8,760	1,402	1,402	22	88	о <sup>.</sup>	771	0	\$120	\$360	\$0	\$280
88	First Floor	Guidance Office	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	8	107	854	2,200	1,878	Retrofit fixture with (4) T8 LED Tubes	8	80	300	Wall	1	640	1,900	1,408	1,216	27	214 3	00	470	192	\$103	\$1,200	\$120	\$980
89	First Floor	Office 1	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	107	213	2,200	469	Retrofit fixture with (4) T8 LED Tubes	2	80	300	Wall	1	160	1,900	352	304	27	53 3	00	117	48	\$26	\$300	\$120	\$320
90	First Floor	Office 2	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	107	213	2,200	469	Retrofit fixture with (4) T8 LED Tubes	2	80	300	Wall	1	160	1,900	352	304	27	53 3	00	117	48	\$26	\$300	\$120	\$320
91	First Floor	Office 3	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	107	213	2,200	469	Retrofit fixture with (4) T8 LED Tubes	2	80	300	Wall	1	160	1,900	352	304	27	53 3	00	117	48	\$26	\$300	\$120	\$320
92	First Floor	Office 4	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	107	107	2,200	235	Retrofit fixture with (4) T8 LED Tubes	1	80	300	Wall	1	80	1,900	176	152	27	27 3	00	59	24	\$13	\$150	\$120	\$210
93	First Floor	Vice Principle Sec.	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	107	320	2,200	704	Retrofit fixture with (4) T8 LED Tubes	3	80	300	Wall	1	240	1,900	528	456	27	80 3	00	176	72	\$39	\$450	\$120	\$430
94	First Floor	Main Entrance	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	62	372	5,000	1,860	Retrofit fixture with (2) T8 LED Tubes	6	40	300	Ceiling	1	240	4,700	1,200	1,128	22	132 3	00	660	72	\$114	\$540	\$250	\$635
95	First Floor	Vice Principle	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	62	186	2,200	409	Retrofit fixture with (2) T8 LED Tubes	3	40	300	Wall	1	120	1,900	264	228	22	66 3	00	145	36	\$28	\$270	\$120	\$310
96	First Floor	Room	60W incandescent	3	60	180	2,200	396	23W Screw-in CFL	3	18	300	Wall	1	54	1,900	119	103	42	126 3	00	277	16	\$46	\$15	\$120	\$115
97	First Floor	Main Office	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	8	62	496	2,200	1,091	Retrofit fixture with (2) T8 LED Tubes	8	40	300	Wall	1	320	1,900	704	608	22	176 3	00	387	96	\$75	\$720	\$120	\$660
98	First Floor	Principal	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	62	186	2,200	409	Retrofit fixture with (2) T8 LED Tubes	3	40	300	Wall	1	120	1,900	264	228	22	66 3	00	145	36	\$28	\$270	\$120	\$310
99	First Floor	Bathroom	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	62	62	2,200	136	Retrofit fixture with (2) T8 LED Tubes	1	40	300	Ceiling	1	40	1,900	88	76	22	22 3	00	48	12	\$9	\$90	\$250	\$285
100	First Floor	Conference	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	62	124	2,200	273	Retrofit fixture with (2) T8 LED Tubes	2	40	300	Ceiling	1	80	1,900	176	152	22	44 3	00	97	24	\$19	\$180	\$250	\$355
101	First Floor	Storage	60W incandescent	2	60	120	500	60	23W Screw-in CFL	2	18	0	Ceiling	0	36	500	18	18	42	84	D	42	0	\$7	\$10	\$0	\$10
102	First Floor	Girls Room	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	62	248	2,200	546	Retrofit fixture with (2) T8 LED Tubes	4	40	300	Ceiling	1	160	1,900	352	304	22	88 3	00	194	48	\$38	\$360	\$250	\$495

	$\mathbf{D}$		LIGHTING UPGRADE PROJECT		JSTOM				Dunellen Public Schools				LITY SQ	). FT.			E OF Al										
Don	ne-Tech, Inc.		LINE X LINE DETAIL	FA	CILITY	<b>'</b> :			Dunellen High School				77,794			12	2/31/20 <sup>-</sup>	13									
	SPACE	DESCRIPTION							RI	EPLA	CEMEN	NT FIX	TURES								ENERG	Y ANAL	YSIS		COS		IS
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	default ANNUAL HOURS 910	PRE ANNUAL KWH	POST PROPOSED FIXTURE DESCRIPTION FIXT. QTY	WA	, H	NNUAL IOURS SAVED	SENSOR S TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS 910	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS) \$0.155	TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
103	First Floor	Closet	4ft Wall Mounted , Prismatic Lens, w/ (2) F32T8/32w Lamps & (1) Electronic Ballast	1	68	68	500	34	Retrofit fixture with (2) T8 LED Tubes 1	4	40	0	Ceiling	0	40	500	20	20	28	28	0	14	0	\$2	\$90	\$0	\$70
104	First Floor	Girls Locker Room Entry	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pandant, No Lens	1	68	68	2,200	150	Retrofit fixture with (2) T8 LED Tubes 1	4	40	300	Ceiling	1	40	1,900	88	76	28	28	300	62	12	\$12	\$90	\$250	\$285
105	First Floor	Girls Locker Room	8' Pandant Mount, No Lens, w/ (2) F96T12/75w Lamps & (1) Magnetic Ballast	2	142	283	2,200	623	Retrofit fixture with (2) T8 LED Tubes 2	4	40	300	Ceiling	1	80	1,900	176	152	102	203	300	447	24	\$73	\$180	\$250	\$355
106	First Floor	Girls Locker Room	60W incandescent	2	60	120	2,200	264	23W Screw-in CFL 2	1	18	300	Ceiling	1	36	1,900	79	68	42	84	300	185	11	\$30	\$10	\$250	\$225
107	First Floor	Girls Locker Room	4' Fluorescent Strip with (1) F32T8 & (1) Electronic Ballast, Wall Mounted, No Lens	2	35	70	2,200	154	Retrofit fixture with (1) T8 LED Tubes 2	2	20	300	Ceiling	1	40	1,900	88	76	15	30	300	66	12	\$12	\$120	\$250	\$315
108	First Floor	Hallway	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	5,000	860	Retrofit fixture with (3) T8 LED Tubes 2	6	60	0	Ceiling	0	120	5,000	600	600	26	52	0	260	0	\$40	\$240	\$0	\$180
109	First Floor	Room 1	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	8	86	690	2,200	1,517	Retrofit fixture with (3) T8 LED Tubes 8	6	60	300	Wall	1	480	1,900	1,056	912	26	210	300	461	144	\$94	\$960	\$120	\$820
110	First Floor	Room 2	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	12	107	1,280	2,200	2,817	Retrofit fixture with (4) T8 LED Tubes 12	8	30	300	Wall	1	960	1,900	2,112	1,824	27	320	300	705	288	\$154	\$1,800	\$120	\$1,420
111	First Floor	Boys Room	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	107	320	2,200	704	Retrofit fixture with (4) T8 LED Tubes 3	8	30	300	Ceiling	1	240	1,900	528	456	27	80	300	176	72	\$39	\$450	\$250	\$545
112	First Floor	Room	2'x4' Pandant, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	107	213	2,200	469	Retrofit fixture with (4) T8 LED Tubes 2	8	30	300	Wall	1	160	1,900	352	304	27	53	300	117	48	\$26	\$300	\$120	\$320
113	First Floor	Boiler Room	4' Fluorescent Strip with (2) F32T8 & (1) Electronic Ballast, Pandant, No Lens	11	68	750	8,760	6,572	Retrofit fixture with (2) T8 LED Tubes 11	4	40	0	Ceiling	0	440	8,760	3,854	3,854	28	310	0	2,717	0	\$422	\$990	\$0	\$770
114	First Floor	Boiler Room	60W incandescent	2	60	120	8,760	1,051	23W Screw-in CFL 2	1	18	0	Ceiling	0	36	8,760	315	315	42	84	0	736	0	\$114	\$10	\$0	\$10
115	First Floor	Nurse Entry	2'x2' Recessed Troffer, Prismatic Lens, w/ (2) FBO32T8/835, 32w 800 Lamps & (1) Electronic Ballast	2	62	124	2,200	273	Retrofit fixture with (2) T8 LED Tubes 2	4	40	300	Ceiling	1	80	1,900	176	152	22	44	300	97	24	\$19	\$180	\$250	\$355
116	First Floor	Nurse Office	1'x4' Surface Fixture, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	62	372	2,200	818	Retrofit fixture with (2) T8 LED Tubes 6	4	40	300	Wall	1	240	1,900	528	456	22	132	300	290	72	\$56	\$540	\$120	\$520
117	First Floor	Patient Room	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	107	107	2,200	235	Retrofit fixture with (4) T8 LED Tubes 1	8	30	300	Wall	1	80	1,900	176	152	27	27	300	59	24	\$13	\$150	\$120	\$210
118	First Floor	Bathroom	60W incandescent	3	60	180	2,200	396	23W Screw-in CFL 3	1	18	300	Ceiling	1	54	1,900	119	103	42	126	300	277	16	\$46	\$15	\$250	\$230
119	First Floor	Hallway	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	62	372	5,000	1,860	Retrofit fixture with (2) T8 LED Tubes 6	4	40	0	Ceiling	0	240	5,000	1,200	1,200	22	132	0	660	0	\$103	\$540	\$0	\$420
120	First Floor	Chemistry Hallway	2'x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	62	248	5,000	1,240	Retrofit fixture with (2) T8 LED Tubes 4	4	40	0	Ceiling	0	160	5,000	800	800	22	88	0	440	0	\$68	\$360	\$0	\$280
121	First Floor	Classroom 7 Chemistry	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	20	86	1,720	2,200	3,784	Retrofit fixture with (3) T8 LED Tubes 20	6	60	300	Ceiling	2	1,200	1,900	2,640	2,280	26	520	300	1,144	360	\$234	\$2,400	\$500	\$2,160
122	First Floor	Classroom 8 General Science	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	8	107	854	2,200	1,878	Retrofit fixture with (4) T8 LED Tubes 8	8	30	300	Ceiling	2	640	1,900	1,408	1,216	27	214	300	470	192	\$103	\$1,200	\$500	\$1,240
123	First Floor	Classroom 9	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	9	107	960	2,200	2,113	Retrofit fixture with (4) T8 LED Tubes 9	8	30	300	Ceiling	2	720	1,900	1,584	1,368	27	240	300	529	216	\$116	\$1,350	\$500	\$1,350
124	First Floor	Classroom 7 Chemistry	1'x4' Pandant strip, No Lens, w/ (2) F40T12/34w Lamps & (1) Energy Saving Magnetic Ballast	4	66	264	2,200	581	Retrofit fixture with (2) T8 LED Tubes 4	4	40	300	Ceiling	2	160	1,900	352	304	26	104	300	229	48	\$43	\$360	\$500	\$640
125	First Floor	Classroom 8 General Science	1'x4' Surface Fixture, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	62	248	2,200	546	Retrofit fixture with (2) T8 LED Tubes 4	4	40	300	Ceiling	2	160	1,900	352	304	22	88	300	194	48	\$38	\$360	\$500	\$640
126	First Floor	Classroom 9	60W incandescent	2	60	120	2,200	264	23W Screw-in CFL 2	1	18	0	Ceiling	0	36	2,200	79	79	42	84	0	185	0	\$29	\$10	\$0	\$10
127	First Floor	Hallway	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	107	640	5,000	3,201	Retrofit fixture with (4) T8 LED Tubes 6	8	30	0	Ceiling	0	480	5,000	2,400	2,400	27	160	0	801	0	\$124	\$900	\$0	\$660
127	-	Exterior	150 W Metal Halide Wall Pack	12	185	2,220	3,650	8,103	45 Watt LED Wall Mount 12	4	45	0	Ceiling	0	540	3,650	1,971	1,971	140	1,680	0	6,132	0	\$953	\$4,800	\$0	\$3,600
128	-	Exterior	Wall Mounted Shoebox - 100W incandescent	18	100	1,800	3,650	6,570	40 Watt LED Wall Mount 18	4	40	0	Ceiling	0	720	3,650	2,628	2,628	60	1,080	0	3,942	0	\$613	\$4,230	\$0	\$2,430
129	-	Exterior	Light Poles - 400W HID (Utility Owned)	4	460	1,840	3,650	6,716	None 4	46	60	0	Ceiling	0	1,840	3,650	6,716	6,716	0	0	0	0	0	\$0	\$0	\$0	\$0
					12,134	80,803		196,585	805					109	51,922		128,108	116,203 0				68,477	11,905	12,490	102,050	23,090	93,865



510 Thornall Street, Suite 170 Edison, NJ 08837 Tel: 732.590.0122 Fax: 732.590.0129

ECM #6:

### **HVAC UNIT UPGRADES**

#### **Rooftop AC Unit Replacement - Energy Savings Calculations**

								Existing S	ystem			Pr	oposed S	/stem					
Index	Tag#	Location	Qty	Area Serving	Cooling Capacity (tons)	Existing EER	Existing SEER	Heating Source	Heating Capacity input - MBH		Outside Air Economizer		Cooling SEER	Furnace Efficiency	Total Cost	Total Rebate	Electric Savings, kWh	Demand Savings, kW	Gas Savings, Therms
1	RTU	Faber Elementary School	1	Media Center	12.5	9.5	11	Natural Gas	250	80%	No	12.5	19.1	82%	\$21,400	\$988	10124	3.8	109
2	RTU	Faber Elementary School	1	Computer Room	4	11.2	13	Natural Gas	115	80%	No	12	17.5	82%	\$8,350	\$368	2103	0.3	50
3	RTU	Faber Elementary School	4	Gymnasium	12.5	9.5	11	Natural Gas	250	80%	Yes	12.5	19.1	82%	\$81,400	\$3,950	23946	15.2	435
4	RTU	Dunellen High School	2	Library	5	9	11	None	0		No	12	17.5	82%	\$16,830	\$920	7505	3.3	0
5	RTU	Dunellen High School	1	Special Education	4	9	11	Natural Gas	125	80%	Yes	12	17.5	82%	\$8,350	\$368	1678	1.3	54

Equipment Basis for Design:

3-25 Ton Units: Carrier WeatherExpert or Equivalent 30-75 Ton Units: Carrier WeatherMaker or Equivalent 80-150 Ton Units: Carrier WeatherExpert or Equivalent

	Total Cost	Total Rebate	Electric Savings, kWh	Demand Savings, kW	Gas Savings, Therms
Faber Total	\$111,150	\$5,306	36173	19	594
High School Total	\$25,180	\$1,288	9183	5	54
Total	\$136,330	\$6,594	45356	24	648

Faber Elementary School - Media Center

Total Cooling	Capacity	12.5		Unoccupied S	etback	4	°F (Heating)	]							
Total Heating	Capacity	250	]	Unoccupied L	oad	88%	of design	(3% per degree)							
Economizer		No	1			-	-	-							
Estimated Co	oling Load	80%	of total capaci	ty											
Estimated Hea	ating Load	80%	of total capaci	ty								A	t design conditi	ons	
						_					E	xisting EER=	9.5	New EER=	12.5
ndoor Temp (	Cooling (db)	75				]	Total Cooling Load	(Tons)	10.0		Existing	SEER (Est)=	11.0	New SEER=	19.1
ndoor Temp I			Indoor Temp (	wb)	63		Heating Capacity (M	MBH)	200.0		Ex	isting AFUE=	80%	New AFUE=	82%
	Dunellen High	301001					COOLING ENER	CY SAVINGS							
			1			I			I						
Ambient Bin	Avg. Temp	M.C.W.B.	H.R. Humidity	R.H. Relative			Total Bin Hours		Un-occupied		Existing	Proposed	Existing Unit	New Unit	Energy
Deg F	DB (deg F)	(deg F)	Ratio	Humidity (%)	Occupied	Unoccupied	During Occupied	Occupied Tons	Tons	Ton-Hrs/Yr	SEER	SEER	kWh	kWh	Savings
	(9-)	(9.)	(Grain/lb)				Hours				(Estimated)				(kWh)
Cooling														I. II.	
100-105	102.5	n/a	n/a	n/a	0.0	1.0	1	10.0	4.0	10	11.0	19.1	10.91	6.28	4.63
95-100	97.5	72.6	80.73	30.34%	0.0	21.0	21	10.0	4.0	210	11.0	19.1	229.09	131.94	97.15
90-95	92.5	74.1	97.45	42.55%	22.0	35.0	57	10.0	5.0	460	11.0	19.1	501.82	289.01	212.81
85-90	87.5	71.8	91.95	47.08%	113.0	116.0	229	8.6	4.3	1,479	11.0	19.1	1,612.99	928.95	684.04
80-85	82.5	69.4	86.88	52.20%	188.0	299.0	487	7.1	3.6	2,807	11.0	19.1	3,062.34	1,763.65	1,298.69
75-80	77.5	67.4	84.27	59.74%	182.0	539.0	721	5.7	2.9	3,600	11.0	19.1	3,927.27	2,261.78	1,665.49
70-75	72.5	64.6	77.48	64.93%	172.0	460.0	632	4.3	2.1	2,340	11.0	19.1	2,552.73	1,470.16	1,082.57
65-70	67.5	61.1	70.03	69.81%	210.0	607.0	817	2.9	1.4	2,034	11.0	19.1	2,219.22	1,278.09	941.14
60-65	62.5	56.5	58.40	69.39%	226.0	541.0	767	2.9	1.4	1,869	11.0	19.1	2,038.44		2,038.44
55-60	57.5	50.2	42.08	60.04%	277.0	535.0	812	2.9	1.4	1,924	11.0	19.1	2,099.22		2,099.22
							4,544						18,254	8,130	10,124
							HEATING ENER	GY SAVINGS							
			H.R. Humidity				Total Bin Hours								Energy
Ambient Bin	Avg. Temp	M.C.W.B.	Ratio	R.H. Relative	Occupied	Unoccupied	During Occupied	Occupied	Unoccupied	Therms/Yr	Existing	Proposed	Existing Unit	New Unit	Savings
Deg F	DB (deg F)	(deg F)	(Grain/lb)	Humidity (%)			Hours	Heating MBH	Heating MBH		AFUE	AFUE	Therms	Therms	Therms
			, ,												
50-55	52.5	46.3	36.51	62.51%	237.0	516.0	753	22	20	161	80%	82%	201.27	196.36	4.91
45-50	47.5	41.5	28.95	59.88%	136.0	334.0	470	44	39	202	80%	82%	252.04	245.90	6.15
40-45	42.5	38.0	26.44	66.11%	196.0	452.0	648	67	59	416	80%	82%	520.40	507.71	12.69
35-40	37.5	33.9	22.77	69.31%	203.0	532.0	735	89	78	632	80%	82%	789.60	770.34	19.26
30-35	32.5	29.3	18.58	68.99%	213.0	436.0	649	111	98	693	80%	82%	865.89	844.77	21.12
25-30	27.5	24.6		ļ	123.0	226.0	349	133	117	446	80%	82%	557.07	543.48	13.59
20-25	22.5	19.4		ļ	65.0	249.0	314	156	137	476	80%	82%	595.39	580.87	14.52
15-20	17.5	15.4		ļ	45.0	136.0	181	178	156	312	80%	82%	390.22	380.70	9.52
10-15	12.5	9.8		ļ	11.0	65.0	76	200	176	149	80%	82%	186.70	182.15	4.55
5-10	7.5	4.1		ļ	6.0	25.0	31	200	176	61	80%	82%	75.70	73.85	1.85
0-5	2.5	1.3		ļ	2.0	4.0	6	200	176	12	80%	82%	14.40	14.05	0.35
-5-0	-2.5	0.0			2.0	2.0	4	200	176	8	80%	82%	9.40	9.17	0.23
								1,600							
													4,458	4,349	109
													Therms	Therms	Therms

Faber Elementary School - Computer Room

Total Cooling	Capacity	4	1	Unoccupied S	etback	4	°F (Heating)	1							
Total Heating	Capacity	115		Unoccupied Lo	bad	88%	of design	(3% per degree)							
Economizer		No					, i i i i i i i i i i i i i i i i i i i								
Estimated Co	oling Load	80%	of total capaci	tv											
Estimated He	0	80%	of total capaci	•								А	t design conditi	ons	
	3			,							E	xisting EER=	11.2	New EER=	12.0
Indoor Temp	Cooling (db)	75				ר	Total Cooling Load	(Tons)	3.2			SEER (Est)=	13.0	New SEER=	17.5
Indoor Temp	0( /		Indoor Temp (	(wb)	63		Heating Capacity (M		92.0		0	isting AFUE=	80%	New AFUE=	82%
	Dunelien Higr	301001	indeer reinp (	(113)			• • • •	,	02.0				0070		0270
			T			1	COOLING ENER	GY SAVINGS			1				
Ambient Bin Deg F	Avg. Temp DB (deg F)	M.C.W.B. (deg F)	H.R. Humidity Ratio (Grain/lb)	R.H. Relative Humidity (%)	Occupied	Unoccupied	Total Bin Hours During Occupied Hours	Occupied Tons	Un-occupied Tons	Ton-Hrs/Yr	Existing SEER (Estimated)	Proposed SEER	Existing Unit kWh	New Unit kWh	Energy Savings (kWh)
Cooling															
100-105	102.5	n/a	n/a	n/a	0.0	1.0	1	3.2	1.3	3	13.0	17.5	2.95	2.19	0.76
95-100	97.5	72.6	80.73	30.34%	0.0	21.0	21	3.2	1.3	67	13.0	17.5	62.03	46.08	15.95
90-95	92.5	74.1	97.45	42.55%	22.0	35.0	57	3.2	1.6	147	13.0	17.5	135.88	100.94	34.94
85-90	87.5	71.8	91.95	47.08%	113.0	116.0	229	2.7	1.4	473	13.0	17.5	436.75	324.44	112.31
80-85	82.5	69.4	86.88	52.20%	188.0	299.0	487	2.3	1.1	898	13.0	17.5	829.19	615.97	213.22
75-80	77.5	67.4	84.27	59.74%	182.0	539.0	721	1.8	0.9	1,152	13.0	17.5	1,063.38	789.94	273.44
70-75	72.5	64.6	77.48	64.93%	172.0	460.0	632	1.4	0.7	749	13.0	17.5	691.20	513.46	177.74
65-70	67.5	61.1	70.03	69.81%	210.0	607.0	817	0.9	0.5	651	13.0	17.5	600.90	446.38	154.52
60-65	62.5	56.5	58.40	69.39%	226.0	541.0	767	0.9	0.5	598	13.0	17.5	551.95		551.95
55-60	57.5	50.2	42.08	60.04%	277.0	535.0	812	0.9	0.5	616	13.0	17.5	568.40		568.40
							4,544						4,943	2,839	2,103
	1	-					HEATING ENER	GY SAVINGS		-		r			
Ambient Bin Deg F	Avg. Temp DB (deg F)	M.C.W.B. (deg F)	H.R. Humidity Ratio (Grain/lb)	R.H. Relative Humidity (%)	Occupied	Unoccupied	Total Bin Hours During Occupied Hours	Occupied Heating MBH	Unoccupied Heating MBH	Therms/Yr	Existing AFUE	Proposed AFUE	Existing Unit Therms	New Unit Therms	Energy Savings Therms
50-55	52.5	46.3	36.51	62.51%	237.0	516.0	753	10	9	74	80%	82%	92.58	90.32	2.26
45-50	47.5	41.5	28.95	59.88%	136.0	334.0	470	20	18	93	80%	82%	115.94	113.11	2.83
40-45	42.5	38.0	26.44	66.11%	196.0	452.0	648	31	27	192	80%	82%	239.38	233.55	5.84
35-40	37.5	33.9	22.77	69.31%	203.0	532.0	735	41	36	291	80%	82%	363.22	354.36	8.86
30-35	32.5	29.3	18.58	68.99%	213.0	436.0	649	51	45	319	80%	82%	398.31	388.59	9.71
25-30	27.5	24.6			123.0	226.0	349	61	54	205	80%	82%	256.25	250.00	6.25
20-25	22.5	19.4			65.0	249.0	314	72	63	219	80%	82%	273.88	267.20	6.68
15-20	17.5	15.4			45.0	136.0	181	82	72	144	80%	82%	179.50	175.12	4.38
10-15	12.5	9.8			11.0	65.0	76	92	81	69	80%	82%	85.88	83.79	2.09
5-10	7.5	4.1			6.0	25.0	31	92	81	28	80%	82%	34.82	33.97	0.85
0-5	2.5	1.3			2.0	4.0	6	92	81	5	80%	82%	6.62	6.46	0.16
-5-0	-2.5	0.0			2.0	2.0	4	92	81	3	80%	82%	4.32	4.22	0.11
								736					2.051	2 001	50
													2,051	2,001	50 Theorem
													Therms	Therms	Therms

#### Rooftop AC Unit Replacement Faber Eleme

Faber Elementary School - Gymnasium

Total Cooling	Capacity	12.5	1	Unoccupied S	etback	4	°F (Heating)	1							
Total Heating		250		Unoccupied Lo	bad	88%	of design	(3% per degree)							
Economizer		Yes	1				5	(							
Estimated Co	oling Load	80%	of total capaci	tv											
Estimated Hea	5	80%	of total capaci									A	t design conditi	ons	
	5			· ·							E	xisting EER=	9.5	New EER=	12.5
Indoor Temp	Cooling (db)	75				1	Total Cooling Load	(Tons)	10.0			SEER (Est)=	11.0	New SEER=	19.1
Indoor Temp I	0 \ /		Indoor Temp (	(wb)	63		Heating Capacity (M	. ,	200.0		0	isting AFUE=	80%	New AFUE=	82%
		301001	indeer reinp (	(113)					20010				0070		0270
							COOLING ENER	GY SAVINGS			1				
			H.R. Humidity				Total Bin Hours				Existing				Energy
Ambient Bin	Avg. Temp	M.C.W.B.	Ratio	R.H. Relative	Occupied	Unoccupied	During Occupied	Occupied Tons	Un-occupied	Ton-Hrs/Yr	SEER	Proposed	Existing Unit	New Unit	Savings
Deg F	DB (deg F)	(deg F)	(Grain/lb)	Humidity (%)			Hours		Tons		(Estimated)	SEER	kWh	kWh	(kWh)
Cooling															
100-105	102.5	n/a	n/a	n/a	0.0	1.0	1	10.0	4.0	10	11.0	19.1	10.91	6.28	4.63
95-100	97.5	72.6	80.73	30.34%	0.0	21.0	21	10.0	4.0	210	11.0	19.1	229.09	131.94	97.15
90-95	92.5	74.1	97.45	42.55%	22.0	35.0	57	10.0	5.0	460	11.0	19.1	501.82	289.01	212.81
85-90	87.5	71.8	91.95	47.08%	113.0	116.0	229	8.6	4.3	1,479	11.0	19.1	1,612.99	928.95	684.04
80-85	82.5	69.4	86.88	52.20%	188.0	299.0	487	7.1	3.6	2,807	11.0	19.1	3,062.34	1,763.65	1,298.69
75-80	77.5	67.4	84.27	59.74%	182.0	539.0	721	5.7	2.9	3,600	11.0	19.1	3,927.27	2,261.78	1,665.49
70-75	72.5	64.6	77.48	64.93%	172.0	460.0	632	4.3	2.1	2,340	11.0	19.1	2,552.73	1,470.16	1,082.57
65-70	67.5	61.1	70.03	69.81%	210.0	607.0	817	2.9	1.4	2,034	11.0	19.1	2,219.22	1,278.09	941.14
60-65	62.5	56.5	58.40	69.39%	226.0	541.0	767	2.9	1.4	1,869	11.0	19.1	0.00		0.00
55-60	57.5	50.2	42.08	60.04%	277.0	535.0	812	2.9	1.4	1,924	11.0	19.1	0.00		0.00
							4,544						14,116	8,130	5,987
							HEATING ENER	GY SAVINGS	1			1			
Ambient Bin	Avg. Temp	M.C.W.B.	H.R. Humidity	R.H. Relative			Total Bin Hours	Occupied	Unoccupied		Existing	Proposed	Existing Unit	New Unit	Energy
Deg F	DB (deg F)	(deg F)	Ratio	Humidity (%)	Occupied	Unoccupied	During Occupied	Heating MBH	Heating MBH	Therms/Yr	AFUE	AFUE	Therms	Therms	Savings
Dogi	DD (dog i )	(dog r)	(Grain/lb)	riannaity (70)			Hours	r loading mbri	ricating mbri		74 02	7.1 02	monno	monno	Therms
50-55	52.5	46.3	36.51	62.51%	237.0	516.0	753	22	20	161	80%	82%	201.27	196.36	4.91
45-50	47.5	41.5	28.95	59.88%	136.0	334.0	470	44	39	202	80%	82%	252.04	245.90	6.15
40-45	42.5	38.0	26.44	66.11%	196.0	452.0	648	67	59	416	80%	82%	520.40	507.71	12.69
35-40	37.5	33.9	22.77	69.31%	203.0	532.0	735	89	78	632	80%	82%	789.60	770.34	19.26
30-35	32.5	29.3	18.58	68.99%	213.0	436.0	649	111	98	693	80%	82%	865.89	844.77	21.12
25-30	27.5	24.6			123.0	226.0	349	133	117	446	80%	82%	557.07	543.48	13.59
20-25	22.5	19.4			65.0	249.0	314	156	137	476	80%	82%	595.39	580.87	14.52
15-20	17.5	15.4			45.0	136.0	181	178	156	312	80%	82%	390.22	380.70	9.52
10-15	12.5	9.8			11.0	65.0	76	200	176	149	80%	82%	186.70	182.15	4.55
5-10	7.5	4.1			6.0	25.0	31	200	176	61	80%	82%	75.70	73.85	1.85
0-5	2.5	1.3			2.0	4.0	6	200	176	12	80%	82%	14.40	14.05	0.35
-5-0	-2.5	0.0			2.0	2.0	4	200	176	8	80%	82%	9.40	9.17	0.23
								1,600							
													4,458	4,349	109
													Therms	Therms	Therms

Dunellen High School - Library

Total Cooling	Capacity	5	7	Unoccupied S	etback	4	°F (Heating)								
Total Heating	Capacity	0	7	Unoccupied Lo	oad	88%	of design	(3% per degree)							
Economizer		No	7					•							
Estimated Cod	oling Load	80%	of total capaci	ty											
Estimated Hea	ating Load	80%	of total capaci	ty								A	t design conditi	ons	
											E	xisting EER=	9.0	New EER=	12.0
Indoor Temp (	Cooling (db)	75	5			1	Total Cooling Load	(Tons)	4.0		Existing	SEER (Est)=	11.0	New SEER=	17.5
Indoor Temp H			Indoor Temp (	(wb)	63		Heating Capacity (M	ИВН)	0.0		Ex	isting AFUE=	0%	New AFUE=	82%
r	Dunelien High	301001													
			1	1		1	COOLING ENER	GT SAVINGS				r			
Ambient Bin Deg F	Avg. Temp DB (deg F)	M.C.W.B. (deg F)	H.R. Humidity Ratio (Grain/lb)	R.H. Relative Humidity (%)	Occupied	Unoccupied	Total Bin Hours During Occupied Hours	Occupied Tons	Un-occupied Tons	Ton-Hrs/Yr	Existing SEER (Estimated)	Proposed SEER	Existing Unit kWh	New Unit kWh	Energy Savings (kWh)
Cooling						-	-	-							
100-105	102.5	n/a	n/a	n/a	0.0	1.0	1	4.0	1.6	4	11.0	17.5	4.36	2.74	1.62
95-100	97.5	72.6	80.73	30.34%	0.0	21.0	21	4.0	1.6	84	11.0	17.5	91.64	57.60	34.04
90-95	92.5	74.1	97.45	42.55%	22.0	35.0	57	4.0	2.0	184	11.0	17.5	200.73	126.17	74.56
85-90	87.5	71.8	91.95	47.08%	113.0	116.0	229	3.4	1.7	591	11.0	17.5	645.19	405.55	239.64
80-85	82.5	69.4	86.88	52.20%	188.0	299.0	487	2.9	1.4	1,123	11.0	17.5	1,224.94	769.96	454.98
75-80	77.5	67.4	84.27	59.74%	182.0	539.0	721	2.3	1.1	1,440	11.0	17.5	1,570.91	987.43	583.48
70-75	72.5	64.6	77.48	64.93%	172.0	460.0	632	1.7	0.9	936	11.0	17.5	1,021.09	641.83	379.26
65-70	67.5	61.1	70.03	69.81%	210.0	607.0	817	1.1	0.6	814	11.0	17.5	887.69	557.98	329.71
60-65	62.5	56.5	58.40	69.39%	226.0	541.0	767	1.1	0.6	747	11.0	17.5	815.38		815.38
55-60	57.5	50.2	42.08	60.04%	277.0	535.0	812	1.1	0.6	770	11.0	17.5	839.69		839.69
							4,544						7,302	3,549	3,752

**Dunellen High School - Special Education** 

Total Cooling	Capacity	4	1	Unoccupied S	etback	4	°F (Heating)	1							
Total Heating	Capacity	125		Unoccupied Lo	oad	88%	of design	(3% per degree)							
Economizer		Yes					, i i i i i i i i i i i i i i i i i i i								
Estimated Co	oling Load	80%	of total capaci	tv											
Estimated Hea		80%	of total capaci									At	t design conditi	ons	
			-								E	xisting EER=	9.0	New EER=	12.0
Indoor Temp (	Cooling (db)	75				1	Total Cooling Load	(Tons)	3.2		Existing	SEER (Est)=	11.0	New SEER=	17.5
Indoor Temp I		70	Indoor Temp (	(wb)	63		Heating Capacity (	MBH)	100.0		Ex	isting AFUE=	80%	New AFUE=	82%
	Dunelien righ	SCHOOL				-		GY SAVINGS							
							<b>T</b> ( 10) 11				<b>-</b>				_
Ambient Bin	Avg. Temp	M.C.W.B.	H.R. Humidity	R.H. Relative			Total Bin Hours	0	Un-occupied	T 11 N/.	Existing SEER	Proposed	Existing Unit	New Unit	Energy
Deg F	DB (deg F)	(deg F)	Ratio	Humidity (%)	Occupied	Unoccupied	During Occupied	Occupied Tons	Tons	Ton-Hrs/Yr	-	SEER	kWh	kWh	Savings
-			(Grain/lb)				Hours				(Estimated)				(kWh)
Cooling			-									•			
100-105	102.5	n/a	n/a	n/a	0.0	1.0	1	3.2	1.3	3	11.0	17.5	3.49	2.19	1.30
95-100	97.5	72.6	80.73	30.34%	0.0	21.0	21	3.2	1.3	67	11.0	17.5	73.31	46.08	27.23
90-95	92.5	74.1	97.45	42.55%	22.0	35.0	57	3.2	1.6	147	11.0	17.5	160.58	100.94	59.64
85-90	87.5	71.8	91.95	47.08%	113.0	116.0	229	2.7	1.4	473	11.0	17.5	516.16	324.44	191.72
80-85	82.5	69.4	86.88	52.20%	188.0	299.0	487	2.3	1.1	898	11.0	17.5	979.95	615.97	363.98
75-80	77.5	67.4	84.27	59.74%	182.0	539.0	721	1.8	0.9	1,152	11.0	17.5	1,256.73	789.94	466.78
70-75	72.5	64.6	77.48	64.93%	172.0	460.0	632	1.4	0.7	749	11.0	17.5	816.87	513.46	303.41
65-70	67.5	61.1	70.03	69.81%	210.0	607.0	817	0.9	0.5	651	11.0	17.5	710.15	446.38	263.77
60-65	62.5	56.5	58.40	69.39%	226.0	541.0	767	0.9	0.5	598	11.0	17.5	0.00		0.00
55-60	57.5	50.2	42.08	60.04%	277.0	535.0	812	0.9	0.5	616	11.0	17.5	0.00		0.00
							4,544					8	4,517	2,839	1,678
													1-		
			T	1		1	HEATING ENER	GY SAVINGS	1						
Ambient Din	Ava Tomp	M.C.W.B.	H.R. Humidity				Total Bin Hours	Occupied	Unconvision		Eviating	Dranaad	Evicting Unit	New Unit	Energy
Ambient Bin Deg F	Avg. Temp DB (deg F)	(deg F)	Ratio	R.H. Relative Humidity (%)	Occupied	Unoccupied	During Occupied	Occupied Heating MBH	Unoccupied Heating MBH	Therms/Yr	Existing AFUE	Proposed AFUE	Existing Unit Therms	Therms	Savings
Degi	DB (deg 1)	(deg i )	(Grain/lb)	riumuny (78)			Hours	Theating MDT	Treating WDT		AIOL	AI UL	mennis	menns	Therms
50-55	52.5	46.3	36.51	62.51%	237.0	516.0	753	11	10	81	80%	82%	100.63	98.18	2.45
45-50	47.5	41.5	28.95	59.88%	136.0	334.0	470	22	20	101	80%	82%	126.02	122.95	3.07
40-45	42.5	38.0	26.44	66.11%	196.0	452.0	648	33	29	208	80%	82%	260.20	253.85	6.35
35-40	37.5	33.9	22.77	69.31%	203.0	532.0	735	44	39	316	80%	82%	394.80	385.17	9.63
30-35	32.5	29.3	18.58	68.99%	213.0	436.0	649	56	49	346	80%	82%	432.94	422.38	10.56
25-30	27.5	24.6	1		123.0	226.0	349	67	59	223	80%	82%	278.53	271.74	6.79
20-25	22.5	19.4	1		65.0	249.0	314	78	68	238	80%	82%	297.69	290.43	7.26
15-20	17.5	15.4	1		45.0	136.0	181	89	78	156	80%	82%	195.11	190.35	4.76
10-15	12.5	9.8	1		11.0	65.0	76	100	88	75	80%	82%	93.35	91.07	2.28
5-10	7.5	4.1	1		6.0	25.0	31	100	88	30	80%	82%	37.85	36.93	0.92
0-5	2.5	1.3	1		2.0	4.0	6	100	88	6	80%	82%	7.20	7.02	0.18
-5-0	-2.5	0.0	Ì		2.0	2.0	4	100	88	4	80%	82%	4.70	4.59	0.11
								800							-
													2,229	2,175	54
													Therms	Therms	Therms

#### Heating and Cooling Degree Days

KEWR - Degree days for occupied hours: Monday - Friday, 7 AM - 6 PM (Except July)

		Total	January	February	March	April	May	June	July	August	September	October	November	December
	DB (F)	Hrs	Hrs	Hrs	Hrs	Hrs	Hrs	Hrs	Hrs	Hrs	Hrs	Hrs	Hrs	Hrs
	100 to 105	0												
	95 to 100	0												
_	90 to 95	22				5	6	1		10				
Cooling	85 to 90	113			1	1	20	28		45				
00	Dunellen High	188			10	5		52		72				
C	Dunellen High	182			6			51		74				
	70 to 75	172			3			40		28				
	65 to 70	210			7	25		42		19				
	60 to 65	226			14					5				
	55 to 60	277	7	2				2		-	13			
	50 to 55	237	4					_			1	56		
	45 to 50	136	2	-								18		27
	40 to 45	196										15		
	35 to 40	203	32									2	27	58
	30 to 35	213	68										27	57
ing	25 to 30	123	40										10	
Heating	20 to 25	65											6	
Ĩ	15 to 20	45							-		-			
	10 to 15	11	7	3										
	5 to 10	6	6	-										
	0 to 5	2												
												-		
	-5 to 0	2	2											
	-5 to 0	2		cent above)										
KEWR - Deg	-5 to 0 ree days for un	occupied hours	s (Any hours ex											-
KEWR - Deg	ree days for un	occupied hours	s (Any hours ex January	February		April	May	June	July	August	September	October		December
KEWR - Degi	ree days for un DB (F)	occupied hours Total Hrs	s (Any hours ex		March Hrs	April Hrs	May Hrs	June Hrs	Hrs	August Hrs	September Hrs	October Hrs		December Hrs
KEWR - Deg	DB (F) 100 to 105	occupied hours Total Hrs 1	s (Any hours ex January	February					Hrs 1	Hrs				
KEWR - Deg	ree days for un DB (F) 100 to 105 95 to 100	occupied hours Total Hrs 1 21	s (Any hours ex January Hrs	February		Hrs	Hrs	Hrs	Hrs 1 21	Hrs	Hrs			
	DB (F) 100 to 105 95 to 100 90 to 95	occupied hours Total Hrs 1 21 57	s (Any hours ex January Hrs	February		Hrs 5	Hrs 6	Hrs 1	Hrs 1 21 29	Hrs 16	Hrs	Hrs		
	ree days for unit DB (F) 100 to 105 95 to 100 90 to 95 85 to 90	Total Hrs 1 21 57 229	s (Any hours ex January Hrs	February	Hrs  1	Hrs 5 10	Hrs 6 28	Hrs 1 45	Hrs 1 21 29 63	Hrs 16 64	Hrs 18	Hrs		
	ree days for und DB (F) 100 to 105 95 to 100 90 to 95 85 to 90 80 to 85	Total Hrs 1 21 57 229 487	s (Any hours ex January Hrs	February	Hrs 1 11	Hrs 5 10 12	Hrs 6 28 45	Hrs 1 45 120	Hrs 1 21 29 63 132	Hrs 16 64 130	Hrs 18 37	Hrs	Hrs	
KEWR - Deg	DB (F) 100 to 105 95 to 100 90 to 95 85 to 90 80 to 85 75 to 80	occupied hours Total Hrs 1 21 57 229 487 721	s (Any hours ex January Hrs	February	Hrs 1 11 13	Hrs 5 10 12 8	Hrs 6 28 45 36	Hrs 1 45 120 128	Hrs 1 21 29 63 132 179	Hrs 16 64 130 268	Hrs 18 37 87	Hrs 	Hrs	
	DB (F) 100 to 105 95 to 100 90 to 95 85 to 90 80 to 85 75 to 80 70 to 75	occupied hours Total Hrs 1 21 57 229 487 721 632	s (Any hours ex January Hrs	February	Hrs 1 11 13 9	Hrs 5 10 12 8 13	Hrs 6 28 45 36 59	Hrs 1 45 120 128 131	Hrs 1 21 29 63 132 179 171	Hrs 16 64 130 268 94	Hrs 18 37 87 134	Hrs  	Hrs	Hrs
	ree days for unit DB (F) 100 to 105 95 to 100 90 to 95 85 to 90 80 to 85 75 to 80 70 to 75 65 to 70	occupied hours Total Hrs 1 21 57 229 487 721 632 817	s (Any hours ex January Hrs	February	Hrs 1 11 13 9 25	Hrs 5 10 12 8 13 39	Hrs 6 28 45 36 59 87	Hrs 1 45 120 128 131 131	Hrs 1 21 29 63 132 179 171 145	Hrs 16 64 130 268 94 88	Hrs 18 37 87 134 165	Hrs   	Hrs Hrs Hrs Hrs Hrs	Hrs
	ree days for unit DB (F) 100 to 105 95 to 100 90 to 95 85 to 90 80 to 85 75 to 80 75 to 80 70 to 75 65 to 70 60 to 65	occupied hours Total Hrs 1 21 57 229 487 721 632 817 767	s (Any hours ex January Hrs	February Hrs	Hrs 1 11 13 9 25 37	Hrs 5 10 12 8 39 61	Hrs 6 28 45 36 59 87 156	Hrs 1 45 120 128 131 170 95	Hrs 1 21 29 63 132 179 171 171 145 3	Hrs 16 64 130 268 94 88 61	Hrs 18 37 87 134 165 151	Hrs 2 21 83 149	Hrs 	Hrs
	DB (F)           100 to 105           95 to 100           90 to 95           85 to 90           80 to 85           75 to 80           70 to 75           65 to 70           60 to 65           55 to 60	occupied hours Total Hrs 1 21 57 229 487 721 632 817 767 812	s (Any hours ex January Hrs	February Hrs	Hrs 1 1 13 9 25 37 51	Hrs 5 10 12 8 13 39 61 121	Hrs 6 28 45 36 59 87 156 220	Hrs 1 45 120 128 131 131	Hrs 1 21 29 63 132 179 171 171 145 3	Hrs 16 64 130 268 94 88	Hrs 18 37 87 134 165 151 98	Hrs 2 21 83 149 154	Hrs 	Hrs
	DB (F)           100 to 105           95 to 100           90 to 95           85 to 90           80 to 85           75 to 80           70 to 75           65 to 70           60 to 65           55 to 60           50 to 55	occupied hours Total Hrs 1 21 57 229 487 721 632 817 767 812 753	s (Any hours ex January Hrs	February Hrs	Hrs 1 11 13 9 25 37 37 51 85	Hrs 5 10 12 8 39 61 121 163	Hrs 6 28 45 36 59 87 156 220 91	Hrs 1 45 120 128 131 170 95	Hrs 1 21 29 63 132 179 171 171 145 3	Hrs 16 64 130 268 94 88 61	Hrs 18 37 87 134 165 151	Hrs 2 21 83 149 154 161	Hrs 15 54 91 120	Hrs 12 51
	DB (F)           100 to 105           95 to 100           90 to 95           85 to 90           80 to 85           75 to 80           70 to 75           65 to 70           60 to 65           55 to 60           50 to 55           45 to 50	occupied hours Total Hrs 1 21 57 229 487 721 632 817 767 812 753 470	s (Any hours ex January Hrs 15 15 13 4	February Hrs	Hrs 1 11 13 9 25 37 51 85 88 89	Hrs 5 10 12 8 13 39 61 11 121 163 87	Hrs 6 28 45 36 59 87 156 220 91 16	Hrs 1 45 120 128 131 170 95	Hrs 1 21 29 63 132 179 171 171 145 3	Hrs 16 64 130 268 94 88 61	Hrs 18 37 87 134 165 151 98	Hrs 2 21 83 149 154 161 88	Hrs 15 54 91 120 81	Hrs
	DB (F)           100 to 105           95 to 100           90 to 95           85 to 90           80 to 85           75 to 80           70 to 75           65 to 70           60 to 65           55 to 60           50 to 55           45 to 50           40 to 45	occupied hours Total Hrs 1 21 57 229 487 721 632 817 767 812 753 470 648	s (Any hours ex January Hrs 15 15 13 4 31	February Hrs 4 4 33 44 78	Hrs 1 1 13 9 25 37 51 85 89 127	Hrs 5 10 12 8 13 39 61 121 163 87 131	Hrs 6 28 45 36 59 87 156 220 91 16	Hrs 1 45 120 128 131 170 95	Hrs 1 21 29 63 132 179 171 171 145 3	Hrs 16 64 130 268 94 88 61	Hrs 18 37 87 134 165 151 98	Hrs 2 21 83 149 154 68 88 68	Hrs 15 54 91 120 81 111	Hrs 12 51 60 102
	DB (F)           100 to 105           95 to 100           90 to 95           85 to 90           80 to 85           75 to 80           70 to 75           65 to 70           60 to 65           55 to 60           50 to 55           45 to 50           40 to 45           35 to 40	occupied hours Total Hrs 1 21 57 229 487 721 632 817 767 812 753 470 648 735	s (Any hours ex January Hrs 115 13 13 4 4 31 81	February Hrs 4 4 33 44 78 143	Hrs 1 11 13 9 25 37 51 85 89 127 146	Hrs 5 10 12 8 13 39 61 121 163 87 121 163 87 131 58	Hrs 6 28 45 36 59 87 156 220 91 16	Hrs 1 45 120 128 131 170 95	Hrs 1 21 29 63 132 179 171 171 145 3	Hrs 16 64 130 268 94 88 61	Hrs 18 37 87 134 165 151 98	Hrs 2 21 83 149 154 161 88	Hrs 15 54 91 120 81 111 113	Hrs 12 51 60 102 176
Cooling	DB (F)           100 to 105           95 to 100           90 to 95           85 to 90           80 to 85           75 to 80           70 to 75           65 to 70           60 to 65           55 to 60           50 to 55           45 to 50           44 to 45           35 to 40           30 to 35	occupied hours Total Hrs 1 21 57 229 487 721 632 817 767 812 753 470 648 735 649	s (Any hours ex January Hrs 115 131 4 31 81 172	February Hrs 4 33 44 78 143 138	Hrs 1 1 11 13 9 25 37 51 85 89 127 146 76	Hrs 5 10 12 8 13 39 61 121 163 87 121 163 87 131 58	Hrs 6 28 45 36 59 87 156 220 91 16	Hrs 1 45 120 128 131 170 95	Hrs 1 21 29 63 132 179 171 171 145 3	Hrs 16 64 130 268 94 88 61	Hrs 18 37 87 134 165 151 98	Hrs 2 21 83 149 154 68 88 68	Hrs 15 54 91 120 81 111 111 113 58	Hrs 12 51 60 102 177 193
Cooling	ree days for unit DB (F) 100 to 105 95 to 100 90 to 95 85 to 90 80 to 85 75 to 80 70 to 75 65 to 70 60 to 65 55 to 60 50 to 55 45 to 50 40 to 45 35 to 40 30 to 35 25 to 30	occupied hours Total Hrs 1 21 57 229 487 721 632 817 767 812 753 470 649 349	s (Any hours ex January Hrs 115 115 113 4 4 311 81 172 107	February Hrs 4 33 44 4 33 44 4 33 3 44 4 33 3 43 56	Hrs 1 1 13 9 25 37 51 85 89 127 146 76 41	Hrs 5 100 12 8 339 61 121 163 87 131 58 212	Hrs 6 28 45 36 59 87 156 220 91 16	Hrs 1 45 120 128 131 170 95	Hrs 1 21 29 63 132 179 171 171 145 3	Hrs 16 64 130 268 94 88 61	Hrs 18 37 87 134 165 151 98	Hrs 2 21 83 149 154 68 88 68	Hrs 15 54 91 120 81 111 111 113 58 49	Hrs 12 51 60 102 177 193 96
Cooling	DB (F)           100 to 105           95 to 100           90 to 95           85 to 90           80 to 85           75 to 80           70 to 75           65 to 70           60 to 65           55 to 60           50 to 55           45 to 50           40 to 45           35 to 40           30 to 35           25 to 30           20 to 25	occupied hours Total Hrs 1 21 57 229 487 721 632 817 767 812 753 470 648 735 649 349 314	s (Any hours ex January Hrs 115 115 113 4 311 811 172 107 141	February Hrs	Hrs 1 1 11 13 9 25 37 51 85 89 127 146 76 41 24	Hrs 5 10 12 8 13 39 61 121 163 87 131 58 12	Hrs 6 28 45 36 59 87 156 220 91 16	Hrs 1 45 120 128 131 170 95	Hrs 1 21 29 63 132 179 171 171 145 3	Hrs 16 64 130 268 94 88 61	Hrs 18 37 87 134 165 151 98	Hrs 2 21 83 149 154 68 88 68	Hrs 15 54 91 120 81 111 111 113 58	Hrs 12 51 60 102 177 193 96
	DB (F)           100 to 105           95 to 100           90 to 95           85 to 90           80 to 85           75 to 80           70 to 75           65 to 70           60 to 65           55 to 60           55 to 30           20 to 25           15 to 20	occupied hours Total Hrs 1 21 57 229 487 721 632 817 767 812 753 470 648 735 649 349 344 181	s (Any hours ex January Hrs 15 15 13 4 31 4 31 81 172 107 141 95	February Hrs	Hrs 1 1 11 13 9 25 37 51 85 89 127 146 76 41 24 6	Hrs 5 10 12 8 13 39 61 121 163 87 131 58 12	Hrs 6 28 45 36 59 87 156 220 91 16	Hrs 1 45 120 128 131 170 95	Hrs 1 21 29 63 132 179 171 171 145 3	Hrs 16 64 130 268 94 88 61	Hrs 18 37 87 134 165 151 98	Hrs 2 21 83 149 154 68 88 68	Hrs 15 54 91 120 81 111 111 113 58 49	Hrs 12 51 60 102 177 193 96
Cooling	DB (F)           100 to 105           95 to 100           90 to 95           85 to 90           80 to 85           75 to 80           70 to 75           65 to 70           60 to 65           55 to 60           50 to 55           45 to 50           40 to 45           35 to 30           20 to 25           15 to 20           10 to 15	occupied hours Total Hrs 1 21 57 229 487 721 632 817 767 812 753 470 648 735 649 349 349 314 181	s (Any hours ex January Hrs 15 15 13 4 31 81 172 107 141 95 50	February Hrs 4 33 44 78 143 138 56 6 7 80 23	Hrs 1 1 11 13 9 25 37 51 85 89 127 146 76 41 24 6 3	Hrs 5 10 12 8 13 39 61 121 163 87 131 58 12	Hrs 6 28 45 36 59 87 156 220 91 16	Hrs 1 45 120 128 131 170 95	Hrs 1 21 29 63 132 179 171 171 145 3	Hrs 16 64 130 268 94 88 61	Hrs 18 37 87 134 165 151 98	Hrs 2 21 83 149 154 68 88 68	Hrs 15 54 91 120 81 111 111 113 58 49	Hrs 12 51 60 102 177 193 96
Cooling	ree days for unit DB (F) 100 to 105 95 to 100 90 to 95 85 to 90 80 to 85 75 to 80 70 to 75 65 to 70 60 to 65 55 to 60 50 to 55 45 to 50 40 to 45 35 to 40 30 to 35 25 to 30 20 to 25 15 to 20 10 to 15 5 to 10	occupied hours Total Hrs 1 21 57 229 487 721 632 817 767 812 753 470 648 735 649 349 349 314 181 76 31	s (Any hours ex January Hrs 115 13 14 31 172 107 141 195 50 25	February Hrs 4 4 33 44 78 143 138 56 6 6 7 80 23 6	Hrs 1 1 11 13 9 25 37 51 85 89 127 146 76 41 24 6 3	Hrs 5 10 12 8 13 39 61 121 163 87 131 58 12	Hrs 6 28 45 36 59 87 156 220 91 16	Hrs 1 45 120 128 131 170 95	Hrs 1 21 29 63 132 179 171 171 145 3	Hrs 16 64 130 268 94 88 61	Hrs 18 37 87 134 165 151 98	Hrs 2 21 83 149 154 68 88 68	Hrs 15 54 91 120 81 111 111 113 58 49	Hrs 12 51 60 102 177 193 96
Cooling	DB (F)           100 to 105           95 to 100           90 to 95           85 to 90           80 to 85           75 to 80           70 to 75           65 to 70           60 to 65           55 to 60           50 to 55           45 to 50           40 to 45           35 to 30           20 to 25           15 to 20           10 to 15	occupied hours Total Hrs 1 21 57 229 487 721 632 817 767 812 753 470 648 735 649 349 349 314 181	s (Any hours ex January Hrs 115 13 14 31 172 107 141 195 50 25	February Hrs 4 4 33 44 78 143 138 56 6 6 7 80 23 6	Hrs 1 1 11 13 9 25 37 51 85 89 127 146 76 41 24 6 3	Hrs 5 10 12 8 13 39 61 121 163 87 131 58 12	Hrs 6 28 45 36 59 87 156 220 91 16	Hrs 1 45 120 128 131 170 95	Hrs 1 21 29 63 132 179 171 171 145 3	Hrs 16 64 130 268 94 88 61	Hrs 18 37 87 134 165 151 98	Hrs 2 21 83 149 154 68 88 68	Hrs 15 54 91 120 81 111 111 113 58 49	Hrs 12 51 60 102 177 193 96





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ECM #7:

### **BOILER REPLACEMENT**

#### **Boiler Replacement - Dunellen High School**

Natural Hea	ting Capacity at the High So	hool	
RTUs	1455 MBH	25%	
Boiler Rm.	4320 MBH	75%	
Total	5775 MBH		

It is assumed that the total gas consumption of the boilers is proportional to equipment capacity.

Therefore, it is assumed that **75%** of the natural gas is used at the boiler plant.

Annual natural gas consumption for domestic hot water is estimated based on usage during June and October.

			Hig	gh School				]		
Month	Total Natural Gas Therms	Domestic Hot Water, Therms	Net Natural Gas for Heating, Therms	Boiler Consumption, Therms	Total Cost	\$/Therm	Est. Existing Boiler Efcy	Proposed Boiler Efcy	Proposed Natural Gas Therms	Energy Savings, Therms
Jan-13	6,691	438	6,254	4,678	\$4,358	\$0.93	70%	87%	3,764	914
Mar-13	6,346	438	5,909	4,420	\$4,224	\$0.96	70%	87%	3,556	864
Apr-13	4,127	438	3,689	2,759	\$1,951	\$0.71	70%	88%	2,195	564
May-13	1,713	438	1,276	954	\$720	\$0.75	70%	89%	751	204
Jun-13	227	227	0	0	\$0	-	-	-	-	-
Jul-13	170	170	0	0	\$0	-	-	-	-	-
Aug-13	157	157	0	0	\$0	-	-	-	-	-
Sep-13	175	175	0	0	\$0	-	-	-	-	-
Oct-13	253	253	0	0	\$0	-	-	-	-	-
Nov-13	3,697	438	3,260	2,438	\$2,570	\$1.05	70%	89%	1,918	521
Dec-13	7,075	438	6,637	4,965	\$4,581	\$0.92	70%	88%	3,950	1,016
Jan-14	7,279	438	6,841	5,118	\$4,747	\$0.93	70%	87%	4,118	1,000
	37,910	4,045	33,865	25,333	\$23,149	\$0.91			20,251	5,082

#### **Existing Conditions and Assumptions**

1- The H.B. Smith boiler estimated efficiency = 70 %

Total Cost

Material Installation

Total



2- One (1) boiler is sufficient to handle entire heating load. Second boiler provides 100% redundancy.

3-Boilers are insulated with asbestos. Asbestos remediation is not included in the cost of this ECM.

4-Domestic Water Usage Estimated based DOE statistical information (5.2 kBtu/SF/Year) for education facilities

#### **Proposed Changes**

1 - Replace HB Smith Boilers with high efficiency condensing hot water boilers.

#### **Boiler Replacement - Design Basis**

Boiler	# of Units	Capacity, MBH	Action	Proposed
HB Smith	2	4,320	Replace boilers	2 x Aerco BMK 2.0 or similar



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ECM #8:

### DOMESTIC HOT WATER HEATER REPLACEMENT

### **Domestic Water Heater Replacement Savings**

Index	Location	Qty	Area Serving	Storage Capacity, Gals	Fuel	Heating Capacity, MBH	Efficiency, %	Action	Proposed Unit	Efficiency, %	Project Cost	Savings, Therms	Cost Savings
1		1	Bathrooms, Classroooms	200	Natural Gas	250	80%	Replace and resize.	AO Smith Cyclone BTH-120A	95%	\$14,182		
2	Faber Elementary	1	Bathrooms, Classroooms	80	Natural Gas	60	80%	Replace unit.	AO Smith Cyclone BTX-100	95%	\$7,475	648	\$599
3	School	1	Bathrooms, Classroooms	100	Natural Gas	75	80%	Replace unit.	AO Smith Cyclone BTH-120	95%	\$9,312	048	2222
4		1	Kitchen	300	Natural Gas	600	80%	Install condensing unit in parallel	AO Smith Cyclone BTH-120A	95%	\$14,182		
5	Lincoln Middle	1	Bathrooms, Classroooms	71	Natural Gas	120	0%	Replace unit.	AO Smith Cyclone BTH-120	95%	\$9,312	191	\$242
6	School	1	Bathrooms, Classroooms	20	Electric	-	80%	Existing to remain (1)	-	-		191	ŞZ4Z
7	Dunellen High	1	Bathrooms, Classroooms	70	Natural Gas	75	0%	Replace unit.	AO Smith Cyclone BTX-100	95%	\$7,475	565	érro.
8	School	1	Kitchen	-	Natural Gas	-	80%	Replace unit.	AO Smith Cyclone BTH-250A	95%	\$20,725		\$553

( - ) Information Not Available During Survey

1 - Small unit serving one bathroom

	Total Cost	Savings	Payback
Faber Elementary School	\$45,152	\$599	75
Lincoln Middle School	\$9,312	\$242	38
Dunellen High School	\$28,200	\$553	51

Domestic Water Heater Replacement Savings - Faber Elementary School

				Domes	tic Hot Water Savings				
Month	Total Natural Gas Therms	Domestic Hot Water, Therms	Total Cost	\$/Therm	Est. Existing Boiler Efcy	Proposed Boiler Efcy	Proposed Natural Gas Therms	Energy Savings, Therms	Cost Savings
Jan-13	7,670	483	\$442	\$0.92	80%	93%	415	67	\$62
lace and res	6,256	483	\$442	\$0.91	80%	93%	415	67	\$62
Mar-13	10,049	483	\$441	\$0.91	80%	93%	415	67	\$62
Apr-13	3,331	483	\$349	\$0.72	80%	93%	415	67	\$49
Jun-13	1,455	483	\$416	\$0.86	80%	93%	415	67	\$58
Sep-13	777	777	\$872	\$1.12	80%	93%	669	109	\$122
Oct-13	1,051	483	\$392	\$0.81	80%	93%	415	67	\$55
Nov-13	4,940	483	\$483	\$1.00	80%	93%	415	67	\$68
Dec-13	7,429	483	\$449	\$0.93	80%	93%	415	67	\$63
	42,959	4,639	\$4,285	\$0.92			3,991	648	\$599

Sep-13 bill includes usage during July, August, September.

Annual domestic hot water usage is estimated based DOE statistical information (5.2 kBtu/SF/Year) for education facilities

Area 89,203 SF DHW Usage

4639 Therms

Domestic Hot Water Savings											
Month	Total Natural Gas Therms	Domestic Hot Water, Therms	Total Cost	\$/Therm	Est. Existing Boiler Efcy	Proposed Boiler Efcy	Proposed Natural Gas Therms	Energy Savings, Therms	Cost Savings		
Dec-12	3,038	169	\$163	\$0.97	80%	93%	146	24	\$23		
ace and re	3,226	169	\$159	\$0.94	80%	93%	146	24	\$22		
Feb-13	4,624	169	\$157	\$0.93	80%	93%	146	24	\$22		
Mar-13	3,516	169	\$165	\$0.97	80%	93%	146	24	\$23		
Apr-13	2,364	169	\$124	\$0.73	80%	93%	146	24	\$17		
May-13	1,355	169	\$131	\$0.78	80%	93%	146	24	\$18		
Jun-13	39	39	\$132	\$3.38	80%	93%	34	5	\$18		
Jul-13	23	23	\$121	\$5.18	80%	93%	20	3	\$17		
Aug-13	23	23	\$121	\$5.17	80%	93%	20	3	\$17		
Sep-13	33	33	\$128	\$3.87	80%	93%	28	5	\$18		
Oct-13	61	61	\$148	\$2.41	80%	93%	53	9	\$21		
Nov-13	1,950	169	\$186	\$1.10	80%	93%	146	24	\$26		
	20,252	1,365	\$1,735				1,174	191	\$242		

Annual domestic hot water usage is estimated based DOE statistical information (5.2 kBtu/SF/Year) for education facilities

Area 26,248 SF

DHW Usage 1365 Therms

Domestic Hot Water Savings											
Month	Total Natural Gas Therms	Domestic Hot Water, Therms	Total Cost	\$/Therm	Est. Existing Boiler Efcy	Proposed Boiler Efcy	Proposed Natural Gas Therms	Energy Savings, Therms	Cost Savings		
Jan-13	6,691	438	\$408	\$0.93	80%	93%	377	61	\$57		
Mar-13	6,346	438	\$418	\$0.96	80%	93%	377	61	\$58		
Apr-13	4,127	438	\$309	\$0.71	80%	93%	377	61	\$43		
May-13	1,713	438	\$330	\$0.75	80%	93%	377	61	\$46		
Jun-13	227	227	\$265	\$1.17	80%	93%	195	32	\$37		
Jul-13	170	170	\$225	\$1.32	80%	93%	146	24	\$31		
Aug-13	157	157	\$216	\$1.38	80%	93%	135	22	\$30		
Sep-13	175	175	\$229	\$1.31	80%	93%	151	24	\$32		
Oct-13	253	253	\$283	\$1.12	80%	93%	217	35	\$40		
Nov-13	3,697	438	\$461	\$1.05	80%	93%	377	61	\$64		
Dec-13	7,075	438	\$404	\$0.92	80%	93%	377	61	\$56		
Jan-14	7,279	438	\$406	\$0.93	80%	93%	377	61	\$57		
	37,910	4,045	\$3,954	\$0.98			3,480	565	\$553		

Domestic Water Heater Replacement Savings - Dunellen High School

Annual domestic hot water usage is estimated based DOE statistical information (5.2 kBtu/SF/Year) for education facilities

Area 77,794 SF

DHW Usage 4045 Therms





510 Thornall Street, Suite 170 Edison, NJ 08837 Tel: 732.590.0122 Fax: 732.590.0129

ECM #9:

# **DESTRATIFICATION FANS**

#### **De-stratification Fans**

Index	Building	Space	Heating System Efficiency		Subject Space Floor Area SF	Estimated Heating Load, MBH	Total Heating Energy Cons. Therms	Subject Space Heating Energy Cons. Therms*	Estimated Stratification °F	Resultant Overheating* °F	Existing Unoccupied Setback °F	Est. Energy Savings, Therms	Est. Energy Savings, kWh
1	Faber Elementary School	All Purpose Room	80%	89,203	4050	82	38,320	1740	15	7.5	2	392	-438
2	Faber Elementary School	Gymnasium	80%	89,203	8200	141	38,320	3523	10	5	2	529	-1051
3	Dunellen High School	Gymnasium	70%	77,794	9000	161	33,865	3918	10	5	2	588	-1051

\* Calculated based on the area of the space, total area of the building and total heating energy consumption

### Cost Estimate

1,000 per fan (installed)

Index	Building	Space	# of Fans	Total Cost
1	Faber Elementary School	All Purpose Room	4	\$4,000
2	Faber Elementary School	Gymnasium	6	\$6,000
3	Dunellen High School	Gymnasium	6	\$6,000

# De-stratification Fans: Faber Elementary School - All Purpose Room

			Unoccupied Setback	2	°F
Total Facilty Floor Area	89,203		Net heating Load when set back	94%	of design
Areas w/ Radiators (est)	4,050		Stratification	15	°F (Temperature difference between ceiling and floor)
Net area affected (est)	12%		Average Overheating due to Stratification	8	°F
Est. Heating Energy Cons.	1,740	Therms			-
		-			

	Indoor Temp Cooling (db)	Indoor Temp (wb)	Heating Load (MBH)	82 MBH	Exist AFUE=	80%	New AFUE=	
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				All Purp	ose Roo	m with 1	5°F Tem	perature	Stratificat	ion			
Ambient Bin Deg F	Avg. Temp DB (deg F)	M.C.W.B. (deg F)	H.R. Humidity Ratio (Grain/lb)	R.H. Relative Humidity (%)	Occupied	Occupied Set-back	Total Bin Hours During Occupy Hours	Heating Load without setback, MBH	Heating Load with setback, MBH	Therms/Yr	Existing AFUE	Existing Usage Therms	Existing Usage Therms
50-55	52.5	-	-	-	237	753	990	7	6	64	80%		81
45-50	47.5	-	-	-	136	470	606	14	13	79	80%		99
40-45	42.5	-	-	-	196	648	844	20	19	165	80%		206
35-40	37.5	-	-	-	203	735	938	27	26	244	80%		305
30-35	32.5	-	-	-	213	649	862	34	32	281	80%		351
25-30	27.5	-	-	-	123	349	472	41	38	185	80%		231
20-25	22.5	-	-	-	65	314	379	48	45	172	80%		215
15-20	17.5	-	-	-	45	181	226	55	51	117	80%		147
10-15	12.5	-	-	-	11	76	87	61	58	51	80%		63
5-10	7.5	-	-	-	6	31	37	68	64	24	80%		30
0-5	2.5	-	-	-	2	6	8	75	71	6	80%		7
-5-0	-2.5	-	-	-	2	4	6	75	71	4	80%		5
							5,455						

Fuel Type Natural Gas

1,740 Therms

Fuel HHV 100 kbtu/Therm

Fuel Unit Therms

# De-stratification Fans: Faber Elementary School - All Purpose Room

Stratification0°FAverage Overheating due to Stratification0°F

Indoor Temp Cooling (db)		Indoor Temp (wb)		Net Heating Load (MBH)	63	MBH	Exist AFUE=	80%	New AFUE=	
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			Α	II Purpos	se Room	with Mi	nimal Te	mperatur	e Stratifica	ation			
Ambient Bin Deg F	Avg. Temp DB (deg F)	M.C.W.B. (deg F)	H.R. Humidity Ratio (Grain/lb)	R.H. Relative Humidity (%)	Occupied	Occupied Set-back	Total Bin Hours During Occupy Hours	Heating Load without setback, MBH	Heating Load with setback, MBH	Therms/Yr	Existing AFUE	Existing Usage Therms	Existing Usage Gallons
50-55	52.5	-	-	-	237	753	990	5	5	50	80%		62
45-50	47.5	-	-	-	136	470	606	11	10	61	80%		76
40-45	42.5	-	-	-	196	648	844	16	15	128	80%		160
35-40	37.5	-	-	-	203	735	938	21	20	189	80%		236
30-35	32.5	-	-	-	213	649	862	26	25	218	80%		272
25-30	27.5	-	-	-	123	349	472	32	30	143	80%		179
20-25	22.5	-	-	-	65	314	379	37	35	133	80%		167
15-20	17.5	-	-	-	45	181	226	42	40	91	80%		114
10-15	12.5	-	-	-	11	76	87	48	45	39	80%		49
5-10	7.5	-	-	-	6	31	37	53	50	19	80%		23
0-5	2.5	-	-	-	2	6	8	58	55	4	80%		6
-5-0	-2.5	-	-	-	2	4	6	58	55	3	80%		4

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<b>T</b> 1				

Fan Energy Consumption	4380 Hours (52 weeks, 12 hours per day)	
# of Fans	4	Energy Savings
Fan Power	25 Watts each	
Total Energy Consumption	438 kWh	

1,349

Therms

392

# De-stratification Fans: Faber Elementary School - Gymnasium

	_		Unoccupied Setbac	< 2	°F
Total Facilty Floor Area	89,203		Net heating Load when set bac	x 94%	of design
Areas w/ Radiators (est)	8,200		Stratificatio	n 10	°F (Temperature difference between ceiling and floor)
Net area affected (est)	12%		Average Overheating due to Stratificatio	า 5	°F
Est. Heating Energy Cons.	3,523	Therms			_

Indoor Temp Cooling (db) Indoor Temp (wb) Heat	ig Load (MBH) 166 MI	/IBH Exist AFUE=	80%	New AFUE=	
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				All Purp	ose Roo	m with 1	0°F Tem	perature	Stratificat	ion			
Ambient Bin Deg F	Avg. Temp DB (deg F)	M.C.W.B. (deg F)	H.R. Humidity Ratio (Grain/lb)	R.H. Relative Humidity (%)	Occupied	Occupied Set-back	Total Bin Hours During Occupy Hours	Heating Load without setback, MBH	Heating Load with setback, MBH	Therms/Yr	Existing AFUE	Existing Usage Therms	Existing Usage Therms
50-55	52.5	-	-	-	237	753	990	14	13	131	80%		163
45-50	47.5	-	-	-	136	470	606	28	26	160	80%		200
40-45	42.5	-	-	-	196	648	844	42	39	334	80%		418
35-40	37.5	-	-	-	203	735	938	55	52	495	80%		618
30-35	32.5	-	-	-	213	649	862	69	65	569	80%		712
25-30	27.5	-	-	-	123	349	472	83	78	374	80%		468
20-25	22.5	-	-	-	65	314	379	97	91	349	80%		436
15-20	17.5	-	-	-	45	181	226	111	104	238	80%		298
10-15	12.5	-	-	-	11	76	87	125	117	103	80%		128
5-10	7.5	-	-	-	6	31	37	138	130	49	80%		61
0-5	2.5	-	-	-	2	6	8	152	143	12	80%		15
-5-0	-2.5	-	-	-	2	4	6	152	143	9	80%		11
							5,455						

Fuel Type Natural Gas

3,527

Fuel HHV 100 kbtu/Therm

Fuel Unit Therms

Stratification 0 °F Average Overheating due to Stratification 0 °F

Indoor Temp Cooling (db)		Indoor Temp (wb)		Net Heating Load (MBH)	141	MBH	Exist AFUE=	80%	New AFUE=	
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All Purpose Room with Minimal Temperature Stratification														
Ambient Bin Deg F	Avg. Temp DB (deg F)	M.C.W.B. (deg F)	H.R. Humidity Ratio (Grain/lb)	R.H. Relative Humidity (%)	Occupied	Occupied Set-back	Total Bin Hours During Occupy Hours	Heating Load without setback, MBH	Heating Load with setback, MBH	Therms/Yr	Existing AFUE	Existing Usage Therms	Existing Usage Gallons	
50-55	52.5	-	-	-	237	753	990	12	11	111	80%		139	
45-50	47.5	-	-	-	136	470	606	24	22	136	80%		170	
40-45	42.5	-	-	-	196	648	844	35	33	284	80%		355	
35-40	37.5	-	-	-	203	735	938	47	44	420	80%		526	
30-35	32.5	-	-	-	213	649	862	59	55	484	80%		605	
25-30	27.5	-	-	-	123	349	472	71	66	318	80%		398	
20-25	22.5	-	-	-	65	314	379	82	77	296	80%		371	
15-20	17.5	-	-	-	45	181	226	94	88	202	80%		253	
10-15	12.5	-	-	-	11	76	87	106	99	87	80%		109	
5-10	7.5	-	-	-	6	31	37	118	111	41	80%		52	
0-5	2.5	-	-	-	2	6	8	129	122	10	80%		12	
-5-0	-2.5	-	-	-	2	4	6	129	122	7	80%		9	

			mennis
Fan Energy Consumption	4380 Hours (52 weeks, 12 hours per day)		
# of Fans	6	Energy Savings	529
Fan Power	40 Watts each		Therms
Total Energy Consumption	1051.2 kWh		

2,998

# De-stratification Fans: Dunellen High School - Gymnasium

			Unoccupied Setback	2	°F
Total Facilty Floor Area	77,794		Net heating Load when set back	94%	of design
Areas w/ Radiators (est)	9,000		Stratification	10	°F (Temperature difference between ceiling and floor)
Net area affected (est)	12%		Average Overheating due to Stratification	5	°F
Est. Heating Energy Cons.	3,918	Therms			

	Indoor Temp Cooling (db)		Indoor Temp (wb)		Heating Load (MBH)	161	MBH	Exist AFUE=	70%	New AFUE=	
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				All Purp	ose Roo	m with 1	0°F Tem	perature	Stratificat	ion			
Ambient Bin Deg F	Avg. Temp DB (deg F)	M.C.W.B. (deg F)	H.R. Humidity Ratio (Grain/lb)	R.H. Relative Humidity (%)	Occupied	Occupied Set-back	Total Bin Hours During Occupy Hours	Heating Load without setback, MBH	Heating Load with setback, MBH	Therms/Yr	Existing AFUE	Existing Usage Therms	Existing Usage Therms
50-55	52.5	-	-	-	237	753	990	13	13	127	70%		182
45-50	47.5	-	-	-	136	470	606	27	25	155	70%		222
40-45	42.5	-	-	-	196	648	844	40	38	325	70%		464
35-40	37.5	-	-	-	203	735	938	54	51	481	70%		687
30-35	32.5	-	-	-	213	649	862	67	63	554	70%		791
25-30	27.5	-	-	-	123	349	472	81	76	364	70%		520
20-25	22.5	-	-	-	65	314	379	94	89	339	70%		484
15-20	17.5	-	-	-	45	181	226	108	101	231	70%		331
10-15	12.5	-	-	-	11	76	87	121	114	100	70%		143
5-10	7.5	-	-	-	6	31	37	135	126	47	70%		68
0-5	2.5	-	-	-	2	6	8	148	139	11	70%		16
-5-0	-2.5	-	-	-	2	4	6	148	139	9	70%		12
							5,455						

Fuel Type Natural Gas

Fuel HHV 100 kbtu/Therm

- ----

Fuel Unit Therms

3,919 Therms 
 Stratification
 0
 °F

 Average Overheating due to Stratification
 0
 °F

Indoor Temp Cooling	db)	Indoor Temp (wb)		Net Heating Load (MBH)	137	MBH	Exist AFUE=	70%	New AFUE=		
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			Α	II Purpo	se Room	with Mi	nimal Te	mperatur	e Stratifica	ation			
Ambient Bin Deg F	Avg. Temp DB (deg F)	M.C.W.B. (deg F)	H.R. Humidity Ratio (Grain/lb)	R.H. Relative Humidity (%)	Occupied	Occupied Set-back	Total Bin Hours During Occupy Hours	Heating Load without setback, MBH	Heating Load with setback, MBH	Therms/Yr	Existing AFUE	Existing Usage Therms	Existing Usage Gallons
50-55	52.5	-	-	-	237	753	990	11	11	108	70%		154
45-50	47.5	-	-	-	136	470	606	23	21	132	70%		189
40-45	42.5	-	-	-	196	648	844	34	32	276	70%		394
35-40	37.5	-	-	-	203	735	938	46	43	409	70%		584
30-35	32.5	-	-	-	213	649	862	57	54	470	70%		672
25-30	27.5	-	-	-	123	349	472	69	64	309	70%		442
20-25	22.5	-	-	-	65	314	379	80	75	288	70%		412
15-20	17.5	-	-	-	45	181	226	91	86	197	70%		281
10-15	12.5	-	-	-	11	76	87	103	97	85	70%		121
5-10	7.5	-	-	-	6	31	37	114	107	40	70%		57
0-5	2.5	-	-	-	2	6	8	126	118	10	70%		14
-5-0	-2.5	-	-	-	2	4	6	126	118	7	70%		10

			menns
Fan Energy Consumption	4380 Hours (52 weeks, 12 hours per day)		
# of Fans	6	Energy Savings	588
Fan Power	40 Watts each		Therms
Total Energy Consumption	1051.2 kWh		

#### Heating and Cooling Degree Days

KEWR - Degree days for occupied hours: Monday - Friday, 7 AM - 6 PM (Except July)

		Total	January	February	March	April	May	June	July	August	September	October	November	December
	DB (F)	Hrs	Hrs	Hrs		Hrs	Hrs	Hrs			Hrs	Hrs	Hrs	Hrs
	100 to 105	0												
	95 to 100	0												
5	90 to 95	22				5	6	1		10				
Cooling	85 to 90	113			1	1	20	28		45	18			
õ	80 to 85	188			10	5	20	52		72	29			
U	75 to 80	182			6	2	13			74				
	70 to 75	172			3	3	30			28	60			
	65 to 70	210			7	25				19		29		
	60 to 65	226			14			15		5	33		-	
	55 to 60	277	7	2	24			2			13	56		
	50 to 55	237	4	14	34						1	56		
	45 to 50	136		9	30		3					18		27
	40 to 45	196			34							15		-
	35 to 40	203			34							2	27	
D	30 to 35	213			22								27	
atin	25 to 30	123			15								10	19
Heating	20 to 25	65			5								6	6
_	15 to 20	45	25	18	2									
	10 to 15	11	7	3	1									
	5 to 10	6	-											
	0 to 5	2												
	-5 to 0	2	2											

KEWR - Degree days for unoccupied hours (Any hours except above)

		Total	January	February	March	April	May	June	July	August	September	October	November	December
	DB (F)	Hrs	Hrs	Hrs	Hrs	Hrs	Hrs	Hrs	Hrs	Hrs	Hrs	Hrs	Hrs	Hrs
	100 to 105	1							1					
	95 to 100	21							21					
D	90 to 95	57				5	-		29					
ooling	85 to 90	229			1	10	28							
Č	80 to 85	487			11		-							
-	75 to 80	721			13	-	36					2		
	70 to 75	632			9	-			171	-				
	65 to 70	817			25			170	-					
	60 to 65	767			37					-	151	149		
-	55 to 60	812			51		220	23		23				12
	50 to 55	753		33	85			/			29		120	
	45 to 50	470		44 78	89		16				1	88		60
	40 to 45	648	31	-	127	131						68		102 176
	35 to 40 30 to 35	735 649	81 172	143 138	146 76							18	113 58	
бu	25 to 30	349	1/2	56	41	12							49	
Heating	20 to 25	349	107	67	24								28	54
Ť	15 to 20	181	95		6								20	54
	10 to 15	76			3									
	5 to 10	31		6										
	0 to 5	6	-											
	-5 to 0	4	4											





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ECM #10:

# **KITCHEN HOOD CONTROLS**

### **Kitchen Hood Controls**

Index	Building	Space	# of Hoods	Hood Width	Hood Height	Flow CFM/LF	Estimated Savings Hrs/Day	Est. Energy Savings, Therms	Est. Energy Savings, kWh
1	Faber Elementary School	Kitchen	1	15	5	200	4	352	1079
2	Dunellen High School	Kitchen	1	15	5	200	4	352	1079

\* Calculated based on hourly operation savings by automatically shutting off the units when there is no temperature or smoke activity.

# **Basis of Design**

Greenheck Kitchen Hood Energy Management Panel

Cost Estimate

\$5,000 per controller (installed)

#### Kitchen Hood Controls - Faber Elementary School

Ritchen Hood Controls - Faber Elementary School									
				CFM/Linear					
	# of hoods	Depth	Width	Length	Total CFM				
Hood Sizes	1	5	15	200	3000				
	Swings				4				
Run Hour S	0								
Dally nours	s of operatior	1			7				
Fan HP (est based on 2" static) 1.3									
Fan run hours 800									
Total Electi	ricity Savings				1079 k <sup>v</sup>				

Maximum Heat Load 162.75 MBH

	T ( ) D'				
Ambient Bin Deg F	Total Bin Hours During Occupy Hours	MBH	Therms /Yr	Existing AFUE	Existing Unit Therms
50 to 55	85	18	15	80%	19.21
45 to 50	48	36	17	80%	21.70
40 to 45	65	54	35	80%	44.08
35 to 40	69	72	50	80%	62.39
30 to 35	82	90	74	80%	92.68
25 to 30	43	109	47	80%	58.32
20 to 25	17	127	22	80%	26.90
15 to 20	9	145	13	80%	16.28
10 to 15	3	163	5	80%	6.10
5 to 10	1	163	2	80%	2.03
0 to 5	1	163	2	80%	2.03
	423				
					352

File         Select Location(s)       Select Hours       Select Procedure         Use LEFT Mouse Button       HOURS       Sul MON       THU       File         Use LEFT Mouse Button       HOURS       SUN       MON       THU       File       Select Procedure         Use LEFT Mouse Button       HOURS       SUN       MON       TUE       TUE       Select Hours       Select Procedure         Months       Use LEFT Mouse Button       HOURS       SUN       MON       TUE       Select Month       OU       Colspan="2">SUN       MON       TUE       SUN       MON       TUE       SUN       OU	۲	Selected Location: NEWARK INTERNATIONAL ARPT NJ USAF # 725020 – 🗆 🗙
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City         State         USAF #         Latitude         Longitude         Elevation           NEWARK         NJ         725020         40.717         -74.183         3 m / 10 ft         STOP		Select ALL     All     All     All     All     All
INTERNATIONAL ARPT	INI	City     State     USAF #     Latitude     Longitude     Elevation       NEWARK     NJ     725020     40.717     -74.183     3 m / 10 ft

#### Kitchen Hood Controls - Dunellen High School

Kitchen Hood Controls - Dunenen High School									
				CFM/Linear					
	# of hoods	Depth	Width	Length	Total CFM				
Hood Sizes	1	5	15	200	3000				
Run Hour S Daily hours	avings of operatior	1			4 7				
Fan HP (est based on 2" static) 1.3									
Fan run hours 800									
Total Electr	icity Savings				1079 k <sup>v</sup>	Wh			

Maximum Heat Load 162.75 MBH

Energy Con	sumption - O	ccupied - N	o Setback		
Ambient Bin Deg F	Total Bin Hours During Occupy Hours	MBH	Therms /Yr	Existing AFUE	Existing Unit Therms
50 to 55	85	18	15	80%	19.21
45 to 50	48	36	17	80%	21.70
40 to 45	65	54	35	80%	44.08
35 to 40	69	72	50	80%	62.39
30 to 35	82	90	74	80%	92.68
25 to 30	43	109	47	80%	58.32
20 to 25	17	127	22	80%	26.90
15 to 20	9	145	13	80%	16.28
10 to 15	3	163	5	80%	6.10
5 to 10	1	163	2	80%	2.03
0 to 5	1	163	2	80%	2.03
	423				
					352
					Therms

۰.		×						
File	le Select Location(s) Select Hours Select Procedure							
	Use LEFT Mouse Button or SPACEBAR to select/de-select       OT 02       OT 03       OT 04       OT 04       OT 04       OT 04       OT 04       OT 04       OT 04       OT 04       OT 07       OT 07							
	Print Hours Selection         Select ALL							
INT	City State USAF # Latitude Longitude Elevation NEWARK NJ 725020 40.717 -74.183 3 m / 10 ft INTERNATIONAL ARPT							





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ECM #11:

# **DISHWASHER BOOSTER HEATER**

# Gas Fired Dishwasher Booster Heater

Faber Elementary School
-------------------------

Water Use Per Wash	40 gallons of water
Dishwasher run time	2 /day
Dishwasher usage	200 Days
Total Energy Usage	9296 kBTUs
Electricity Usage	2724 kWh
Electricity Demand	27 kW
Gas Fired Booster Efficiency	80%
Gas Consumption After Conversion	-74 Therms
Estimated Cost	\$2,750 installed

Dunellen High School	
Water Use Per Wash	40 gallons of water
Dishwasher run time	2 /day
Dishwasher usage	200 Days
Total Energy Usage	9296 kBTUs
Electricity Usage	2724 kWh
Electricity Demand	27 kW
Gas Fired Booster Efficiency	80%
Gas Consumption After Conversion	-74 Therms
Estimated Cost	\$2,750 installed

Basis of Design: Vanguard Booster Heaters or equivalent





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ECM #12:

# UNIT VENTILATOR UPGRADES

#### **Unit Ventilator Replacement - Energy Savings Calculations**

Index	Tag#	Location	Qty	Area Serving	Cooling Capacity (tons)	Cooling EER	Heating Fuel	Est. Heating Capacity input - MBH	Heating Efficiency	Year Mfd	Proposed System	Energy Savings, kWh	Energy Savings, Therms
1	UV	Faber Elementary School	15	Classrooms	-	-	Hot Water	15	80%	1960	New Unit Ventilators with EC	4032	1066
2	UV	Dunellen High School	20	Classrooms	-	-	Hot Water	15	80%	1960	Motors, connected to existing BMS	5376	1421
3													

#### Scope of Work

Replace Unit Ventilators with New Unit Ventilators

Proposed units shall be connected to the existing Buildint Management System

Proposed units shall be furnished with EC Motors

Proposed units shall have full outside air damper controls and demand controlled ventilation.

Location	Qty	Total Cost
Faber Elementary School	15	\$75,000
Dunellen High School	20	\$100,000

# **Unit Ventilator Energy Savings**

## per unit

Existing Conditions			
Est. Heating Load (MBH)	15.0	Unoccupied Heating Load (MBH)	
Temperature observed (F)	74	Temperature Setback (F)	
		Temperature Setpoint (F)	
Heating Design Day DT (F)	65	Heating Design DT (F)	
Existing Heating Efcy	80%	Occupied Heating Load (MBH)	
Proposed Heating Efcy		Temperature Setback (F)	
Cost of Natural Gas / Therm		Temperature Setpoint (F)	
		Heating Design DT (F)	

#### Mon - Fri (07:00-17:00) (Except July)

Energy Con	sumption - Occup	ied - No Setba	ck				
Ambient Bin Deg F	Total Bin Hours During Occupy Hours	MBH	Therms /Yr	Existing AFUE	Proposed AFUE	Existing Unit Therms	
50-55	237	2	4	80%	80%	4.94	
45-50	136	3	5	80%	80%	5.67	
40-45	196	5	10	80%	80%	12.25	
35-40	203	7	14	80%	80%	16.92	
30-35	213	8	18	80%	80%	22.19	
25-30	123	10	12	80%	80%	15.38	
20-25	65	12	8	80%	80%	9.48	
15-20	45	13	6	80%	80%	7.50	
10-15	11	15	2	80%	80%	2.06	
5-10	6	15	1	80%	80%	1.13	
0-5	2	15	0	80%	80%	0.38	
-5-0	2	15	0	80%	80%	0.38	
	1,239						
						98	
						Therms	

### Mon - Fri (01-06, 22-23) Weekend (24 hrs)

Energy Con	sumption - Unocc	upied - No Set	back				
Ambient Bin Deg F	Total Bin Hours During Occupy Hours	MBH	Therms /Yr	Existing AFUE	Proposed AFUE	Existing Unit Therms	
50-55	382	2	6	80%	80%	7.96	
45-50	256	3	9	80%	80%	10.67	
40-45	362	5	18	80%	80%	22.63	
35-40	414	7	28	80%	80%	34.50	
30-35	353	8	29	80%	80%	36.77	
25-30	171	10	17	80%	80%	21.38	
20-25	202	12	24	80%	80%	29.46	
15-20	121	13	16	80%	80%	20.17	
10-15	57	15	9	80%	80%	10.69	
5-10	23	15	3	80%	80%	4.31	
0-5	4	15	1	80%	80%	0.75	
-5-0	2	15	0	80%	80%	0.38	
	2,347						
						200	
						Thormo	

# Mon - Fri (18:00-22:00)

Energy Consumption - Occupied - No Setback							
Ambient Bin Deg F	Total Bin Hours During Occupy Hours	MBH	Therms /Yr	Existing AFUE	Proposed AFUE	Existing Unit Therms	
50-55	134	2	2	80%	80%	2.79	
45-50	78	3	3	80%	80%	3.25	
40-45	90	5	5	80%	80%	5.63	
35-40	118	7	8	80%	80%	9.83	
30-35	83	8	7	80%	80%	8.65	
25-30	55	10	6	80%	80%	6.88	
20-25	47	12	5	80%	80%	6.85	
15-20	15	13	2	80%	80%	2.50	
10-15	8	15	1	80%	80%	1.50	
5-10	2	15	0	80%	80%	0.38	
0-5		15	0	80%	80%	0.00	
-5-0		15	0	80%	80%	0.00	
	630						
						48	

Therms

# Mon - Fri (07:00-17:00) (July Only)

Energy Con	sumption - Occup	oied - No Setba	ck				
Ambient Bin Deg F	Total Bin Hours During Occupy Hours	MBH	Therms /Yr	Existing AFUE	Proposed AFUE	Existing Unit Therms	
50-55		2	0	80%	80%	0.00	
45-50		3	0	80%	80%	0.00	
40-45		5	0	80%	80%	0.00	
35-40		7	0	80%	80%	0.00	
30-35		8	0	80%	80%	0.00	
25-30		10	0	80%	80%	0.00	
20-25		12	0	80%	80%	0.00	
15-20		13	0	80%	80%	0.00	
10-15		15	0	80%	80%	0.00	
5-10		15	0	80%	80%	0.00	
0-5		15	0	80%	80%	0.00	
-5-0		15	0	80%	80%	0.00	
	0						
						0	
			-	-		Therms	

 
 Total Bin Hours During Occupy Hours
 Existing Unit Therms

 4,216
 346

# **Unit Ventilator Energy Savings**

### per unit

63

Proposed Conditions			
Est. Heating Load (MBH)	15	Unoccupied Heating Load (MBH)	
Temperature Setpoint (F)	72	Temperature Setback (F)	
Temperature Setback		Temperature Setpoint (F)	
Heating Design Day DT (F)	65	Heating Design DT (F)	
Existing Heating Efcy	80%	Occupied Heating Load	
Proposed Heating Efcy		Temperature Reset (F)	
Cost of Natural Gas / Therm		Temperature Setpoint (F)	

Heating Design DT (F)

#### Mon - Fri (07:00-17:00) (Except July)

Energy Con	sumption - Occup	oied - No Setba	ck				
Ambient Bin Deg F	Total Bin Hours During Occupy Hours	MBH	Therms /Yr	Existing AFUE	Proposed AFUE	Existing Unit Therms	Energy Savings Therms
50-55	237	1.6	4	80%	80%	4.79	4.9
45-50	136	3.2	4	80%	80%	5.49	5.7
40-45	196	4.8	9	80%	80%	11.87	12.3
35-40	203	6.5	13	80%	80%	16.40	16.9
30-35	213	8.1	17	80%	80%	21.50	22.2
25-30	123	9.7	12	80%	80%	14.90	15.4
20-25	65	11.3	7	80%	80%	9.19	9.5
15-20	45	12.9	6	80%	80%	7.27	7.5
10-15	11	14.5	2	80%	80%	2.00	2.1
5-10	6	14.5	1	80%	80%	1.09	1.1
0-5	2	14.5	0	80%	80%	0.36	0.4
-5-0	2	14.5	0	80%	80%	0.36	0.4
	1,239						
						95	98
						Therms	Therms

#### Mon - Fri (01-06, 22-23) Weekend (24 hrs)

Energy Consumption - Unoccupied - Setback							
Ambient Bin Deg F	Total Bin Hours During Occupy Hours	MBH	Therms /Yr	Existing AFUE	Proposed AFUE	Existing Unit Therms	Energy Savings Therms
50-55	382	1	4	80%	80%	5.31	8.0
45-50	256	2	6	80%	80%	7.11	10.7
40-45	362	3	12	80%	80%	15.08	22.6
35-40	414	4	18	80%	80%	23.00	34.5
30-35	353	6	20	80%	80%	24.51	36.8
25-30	171	7	11	80%	80%	14.25	21.4
20-25	202	8	16	80%	80%	19.64	29.5
15-20	121	9	11	80%	80%	13.44	20.2
10-15	57	10	6	80%	80%	7.13	10.7
5-10	23	10	2	80%	80%	2.88	4.3
0-5	4	10	0	80%	80%	0.50	0.8
-5-0	2	10	0	80%	80%	0.25	0.4
	2,347						
						133	200
						Therms	Therms

#### Mon - Fri (18:00-22:00)

Energy Con	sumption - Occup	pied - Setback						
Ambient Bin Deg F	Total Bin Hours During Occupy Hours	MBH	Therms /Yr	Existing AFUE	Proposed AFUE	Existing Unit Therms	:	Energy Savings Therms
50-55	134	1.6	2	80%	80%	2.71		2.8
45-50	78	3.2	3	80%	80%	3.15		3.3
40-45	90	4.8	4	80%	80%	5.45		5.6
35-40	118	6.5	8	80%	80%	9.53		9.8
30-35	83	8.1	7	80%	80%	8.38		8.6
25-30	55	9.7	5	80%	80%	6.66		6.9
20-25	47	11.3	5	80%	80%	6.64		6.9
15-20	15	12.9	2	80%	80%	2.42		2.5
10-15	8	14.5	1	80%	80%	1.45		1.5
5-10	2	14.5	0	80%	80%	0.36		0.4
0-5		14.5	0	80%	80%	0.00		0.0
-5-0		14.5	0	80%	80%	0.00		0.0
	630							
						47		48
						Therms		Therms

### Mon - Fri (07:00-17:00) (July Only)

	(07.00-17.00)	(oury only)					1	
Energy Con	sumption - Occup	bied - Setback						
Ambient Bin Deg F	Total Bin Hours During Occupy Hours	MBH	Therms /Yr	Existing AFUE	Proposed AFUE	Existing Unit Therms		Energy Saving Therm
50-55		2	0	80%	80%	0.00		0.0
45-50		3	0	80%	80%	0.00		0.0
40-45		5	0	80%	80%	0.00		0.0
35-40		6	0	80%	80%	0.00		0.0
30-35		8	0	80%	80%	0.00		0.0
25-30		10	0	80%	80%	0.00		0.0
20-25		11	0	80%	80%	0.00		0.0
15-20		13	0	80%	80%	0.00		0.0
10-15		15	0	80%	80%	0.00		0.0
5-10		15	0	80%	80%	0.00		0.0
0-5		15	0	80%	80%	0.00		0.0
-5-0		15	0	80%	80%	0.00		0.0
	0							
						0		0
						Therms	_	Therms

Total	Total Bin Hours During Occupy Hours			Existing Unit Therms	Energy Savings Therms
	4,216			275	71

Energy Savings Summary	
Existing Energy Consumption (Therms)	346
New Energy Consumption (Therms)	275
Gas Savings (Therms)	71
Gas Savings %	20.5%

Additional Savings due to New EC Motors	
Number of Fan Motors Existing Fan Motor Power	1 250 W
EC Fan Motor Power Fan Power Savings	150 W 100 W
Fan Run Hours Total Annual Fan Run Hours	1,239 (# of occupied hours when OA<55) 2688 Hrs
Total Fan Energy Consumption Existing Total Fan Energy Consumption Proposed	672 kWh 403.2 kWh
Fan Energy Savings	268.8 kWh
Fair Energy Savings	200.0 KWII
Implementation Cost (per unit)	

New Unit Ventilator	\$2,000
Network Connection	\$1,000
Installation	\$2,000
Total	\$5,000



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ECM #13:

# **DEMAND CONTROLLED VENTILATION**

# **Demand Controlled Ventilation**

DCV #	Building	Space	# of HVAC Units	Cooling Capacity, Tons	Est. Heating Capacity, MBH	Est. Cooling Load, Tons (60%)	Est. Heating Load, MBH (25%)	Est. Energy Savings, kWh	Est. Energy Savings, Therms	Project Cost
1	Faber Elementary School	Media Center	1	12.5	250	8	63	2,315	211	\$8,000
2	Faber Elementary School	Gymnasium	4	50	1,000	30	250	9,262	843	\$14,000
3	Faber Elementary School	All Purpose Room	1	0	82	0	82	0	277	\$8,000
4	Lincoln Middle School	Cafetorium	1	40	800	24	200	7,409	675	\$8,000
5	Dunellen High School	Auditorium Seating Area	1	40	800	24	200	7,409	675	\$8,000
6	Dunellen High School	Auditorium Stage	1	20	400	12	100	3,705	337	\$8,000
7	Dunellen High School	Gymnasium	2	0	161	0	161	0	543	\$10,000

# O.A.: Outside Air

#### **Assumptions**

Estimated total cooling load is 60% of the total cooling capacity Estimated total heating load is 25% of the total heating capacity Estimated O.A. heating/cooling Load = 30% total heating/cooling load.

#### Cost of Implementation

\$6,000 per space \$2,000 per unit

			Sav	/ings
DCV #	Building	Project Cost	Electric	Nat. Gas
	Faber Elementary School	\$30,000	11,577	1,331
	Lincoln Middle School	\$8,000	7,409	675
	Dunellen High School	\$26,000	11,114	1,555

### Based on sample calculation (See next page)

Energy Savings	309 kWh/Ton
Energy Savings	3 Therms/MBH

#### Sample Demand Controlled Ventilation Savings

For Net Heating Load	100 MBH	Estimated Outside Air Heating I
For Net Total Cooling Load	100 Tons	Estimated Net Total Cooling Los
		Estimated an description of DOV

g Load, RTUs oad Estimated savings via DCV

30 MBH (30% of total) 30 Tons (30% of total)  $40\%\,$  OA overall reduction

Hours of Operation (Based on 24 Hours)	Start:	0	Stop:	24	Total Cooling Load (Tons)	12.0	Exist EER=		New EER=	
Indoor Temp Cooling (db)	75	Indoor Temp (wb)		63	Heating Capacity (MBH)	12.0	Exist AFUE=	75%	New AFUE=	80%
Indoor Temp Heating (db)	70									

	COOLING ENERGY SAVINGS												
Ambient Bin Deg F	Avg. Temp DB (deg F)	M.C.W.B. (deg F)	H.R. Humidity Ratio (Grain/lb)	R.H. Relative Humidity (%)	Occupied	Unoccupied	Total Bin Hours During Occupy Hours	Un-occupied Tons	Occupied Tons	Ton-Hrs/Yr	Existing EER	Existing Unit kWh	
Cooling													
95-100	97.5	72.6	80.73	30.34%	0	21	21	6.00	12.00	252	7.5	403.20	
90-95	92.5	74.1	97.45	42.55%	22	57	79	6.00	12.00	816	7.5	1,305.60	
85-90	87.5	71.8	91.95	47.08%	113	229	342	5.14	10.29	2,937	8.0	4,404.86	
80-85	82.5	69.4	86.88	52.20%	188	487	675	4.29	8.57	4,980	8.0	7,470.00	
75-80	77.5	67.4	84.27	59.74%	182	721	903	3.43	6.86	5,568	8.5	7,860.71	
70-75	72.5	64.6	77.48	64.93%	172	632	804	2.57	5.14	3,693	8.5	5,213.04	
65-70	67.5	61.1	70.03	69.81%	210	817	1,027	1.71	3.43	3,161	9.0	4,214.86	
60-65	62.5	56.5	58.40	69.39%	226	767	993		Econmizor		10.0	0.00	
55-60	57.5	50.2	42.08	60.04%	277	812	1,089	Econmizer			10.0	0.00	

#### 4,844 144,000

30,872

					HEATIN	IG ENERGY	SAVINGS					
Ambient Bin Deg F	Avg. Temp DB (deg F)	M.C.W.B. (deg F)	H.R. Humidity Ratio (Grain/lb)	R.H. Relative Humidity (%)	Occupied	Unoccupied	Total Bin Hours During Occupy Hours	Unoccupied Heating MBH	Occupied Heating MBH	Therms/Yr	Existing AFUE	Existing Unit Therms
50-55	52.5	46.3	36.51	62.51%	237.0	753.0	990	0.67	1.33	12	75%	15.49
45-50	47.5	41.5	28.95	59.88%	136.0	470.0	606	1.33	2.67	14	75%	19.13
40-45	42.5	38.0	26.44	66.11%	196.0	648.0	844	2.00	4.00	30	75%	39.79
35-40	37.5	33.9	22.77	69.31%	203.0	735.0	938	2.67	5.33	45	75%	59.48
30-35	32.5	29.3	18.58	68.99%	213.0	649.0	862	3.33	6.67	50	75%	67.16
25-30	27.5	24.6			123.0	349.0	472	4.00	8.00	33	75%	43.79
20-25	22.5	19.4			65.0	314.0	379	4.67	9.33	32	75%	43.12
15-20	17.5	15.4			45.0	181.0	226	5.33	10.67	22	75%	28.94
10-15	12.5	9.8			11.0	76.0	87	6.00	12.00	10	75%	13.04
5-10	7.5	4.1			6.0	31.0	37	6.00	12.00	4	75%	5.44
0-5	2.5	1.3			2.0	6.0	8	6.00	12.00	1	75%	1.12
-5-0	-2.5	0.0			2.0	4.0	6	6.00	12.00	1	75%	0.80
							5,455					
Occupied: KEV	/R - Degree days	for occupied h	ours: Monday -	Friday, 7 AM - 6	PM (Except Jul	y)						337
Inoccupied: K	EM/R Degree d	ave for upoccup	ind hours (Any)	ours avcant ab								Thorms

Unoccupied: KEWR - Degree days for unoccupied hours (Any hours except above)





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ECM #14:

# **EXHAUST FAN CONTROLS**

# **Exhaust Fan Control Savings**

Tag	Building	Space	Est. # of Exhaust Fans*	Ave. Exhaust Flow, CFM	Total Exhaust Flow, CFM	Est. Fan Power Savings, kWh	Est. Cooling Savings, kWh	Est. Energy Savings, Therms	Project Cost
1	Faber Elementary School	Media Center	5	500	2,500	1,170	0	1,506	\$5,000
2	Lincoln Middle School	Cafetorium	2	500	1,000	468	0	603	\$2,000
3	Dunellen High School	Gymnasium	3	500	1,500	702	0	904	\$3,000

\* Estimated number of exhaust fans not on a timer

#### **Assumptions**

Estimated total cooling load is 60% of the total cooling capacity Estimated total heating load is 25% of the total heating capacity Estimated O.A. heating/cooling Load = 30% total heating/cooling load. Each fan motor is 100W and shuts off 9 hours per day, 5 days/week, 52 weeks.

#### Cost of Implementation

\$1,000 per unit

			Sa	vings
DCV #	Building	Project Cost	Electric	Nat. Gas
	Faber Elementary School	\$5,000	1,170	1,506
	Lincoln Middle School	\$2,000	468	603
	Dunellen High School	\$3,000	702	904

# Based on sample calculation (See next page)

Energy Savings Energy Savings 0.44 kWh/CFM 0.60 Therms/CFM

#### Sample Exhasut Fan Control Savings

Flow	1000 CFM
Net Heating Load	55 MBH
Net Cooling Load	2.5 Tons

Hours of Operation (Based on 24 Hours)	Start:	0 5	Stop:	24	Total Cooling Load (Tons)	2.5	Exist EER=		New EER=	
Indoor Temp Cooling (db)	75	Indoor Temp (wi	b)	63	Heating Capacity (MBH)	55.0	Exist AFUE=	80%	New AFUE=	80%
Indoor Temp Heating (db)	70									

					COOLIN	IG ENERGY	SAVINGS					
Ambient Bin Deg F	Avg. Temp DB (deg F)	M.C.W.B. (deg F)	H.R. Humidity Ratio (Grain/lb)	R.H. Relative Humidity (%)		CDDs when Exhaust is OFF	Total Bin Hours During Occupy Hours	Un-occupied Tons	Occupied Tons	Ton-Hrs/Yr	Existing EER	Existing Unit kWh
Cooling				•		•						•
95-100	97.5	72.6	80.73	30.34%		0	0	1.25	2.50	0	9.0	0
90-95	92.5	74.1	97.45	42.55%		0	0	1.25	2.50	0	9.0	0
85-90	87.5	71.8	91.95	47.08%		0	0	1.07	2.14	0	9.0	0
80-85	82.5	69.4	86.88	52.20%		27	27	0.89	1.79	48	9.0	64
75-80	77.5	67.4	84.27	59.74%		55	55	0.71	1.43	79	9.0	105
70-75	72.5	64.6	77.48	64.93%		97	97	0.54	1.07	104	10.0	125
65-70	67.5	61.1	70.03	69.81%		168	168	0.36	0.71	120	10.0	144
60-65	62.5	56.5	58.40	69.39%		238	238		Econmizer		10.0	0
55-60	57.5	50.2	42.08	60.04%		292	292		LCOIIIIIZEI		10.0	0

585 30,000 438

					HEATIN	IG ENERGY	SAVINGS					
Ambient Bin Deg F	Avg. Temp DB (deg F)	M.C.W.B. (deg F)	H.R. Humidity Ratio (Grain/lb)	R.H. Relative Humidity (%)		HDDs when Exhaust is OFF	Total Bin Hours During Occupy Hours	Unoccupied Heating MBH	Occupied Heating MBH	Therms/Yr	Existing AFUE	Existing Unit Therms
50-55	52.5	46.3	36.51	62.51%		298	298	3.06	6.11	18	80%	23
45-50	47.5	41.5	28.95	59.88%		206	206	6.11	12.22	25	80%	31
40-45	42.5	38.0	26.44	66.11%		303	303	9.17	18.33	56	80%	69
35-40	37.5	33.9	22.77	69.31%		335	335	12.22	24.44	82	80%	102
30-35	32.5	29.3	18.58	68.99%		292	292	15.28	30.56	89	80%	112
25-30	27.5	24.6				149	149	18.33	36.67	55	80%	68
20-25	22.5	19.4				159	159	21.39	42.78	68	80%	85
15-20	17.5	15.4				95	95	24.44	48.89	46	80%	58
10-15	12.5	9.8				50	50	27.50	55.00	28	80%	34
5-10	7.5	4.1				23	23	27.50	55.00	13	80%	16
0-5	2.5	1.3				4	4	27.50	55.00	2	80%	3
-5-0	-2.5	0.0				1	1	27.50	55.00	1	80%	1
	-						1,915			•	•	
xhaust Hours:	: KEWR - Degree	days for occupi	ed hours: Mond	ay - Saturday, 6	M - 9 PM (Exc	ept July-Sep)						603
lo Exhaust Ho	urs: KEWR - Deg	ree days for und	occupied hours (	Any hours exce	above)							Therms



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# **RENEWABLES CALCULATIONS**

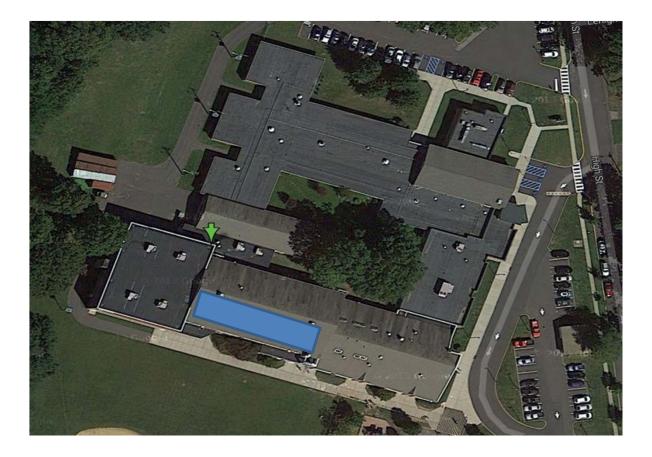
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# DUNELLEN SCHOOLS RENEWABLE CALCULATIONS SOLAR ENERGY

Building	Faber Elementary School	Lincoln Middle School	Dunellen High School	Total
Locations to Install Panels	Roof	Roof	Roof	
Assumpti	ons	_		
System Capacity, kW-dc( maximum utilization of roof space)	20	11	32	63
Annual Electric Generation, kWhrs of AC electricity porduced	27,318	14,310	42,495	84,123
Total Annual Facility Electric Use, kWhrs	611,616	289,033	485,098	1,385,747
% of Total Annual Usage	4%	5%	9%	6%
All-In Cost of Electricity Year 1	\$0.155	\$0.158	\$0.167	\$0.160
Annaul Electric Cost Savings	\$4,245	\$2,258	\$7,091	\$13,594
Estimated SREC Value (Year 1)	\$100 / SREC	\$100 / SREC	\$100 / SREC	\$100 / SREC
Estimated year 1 SREC Revenue	\$2,732	\$1,431	\$4,250	\$8,412
Estimated Total Annual Revenue	\$6,977	\$3,689	\$11,341	\$22,006
Enviromenta	Impact			
Equvilant Annual CO2 Emmison Reduction (tons per year)	9.0	4.7	14.0	27.8
Equvilant Cars Removed From Road Anually	2	1	2	5
Equvilant Acres of Tress Planted Annualy	2	1	4	8
Financial R	esults			
System Installed Cost	\$81,900	\$42,900	\$127,400	\$252,200
Simple Payback ( Years )	12	12	11	11
IRR (25 Years)	6%	7%	7%	7%
Net Present Value (25 yrs, 4% discount rate)	\$56,925	\$30,483	\$98,051	\$182,865
1.Estimated CO2 Emissions Rate: 0.66 lbs/kWh 2.EPA Estimate: 11,560 CO2 per car 3.EPA Estimate:7,333 lbs CO2 per acre of trees planted				

# DUNELLEN SCHOOLS - SOLAR ENERGY ANALYSIS

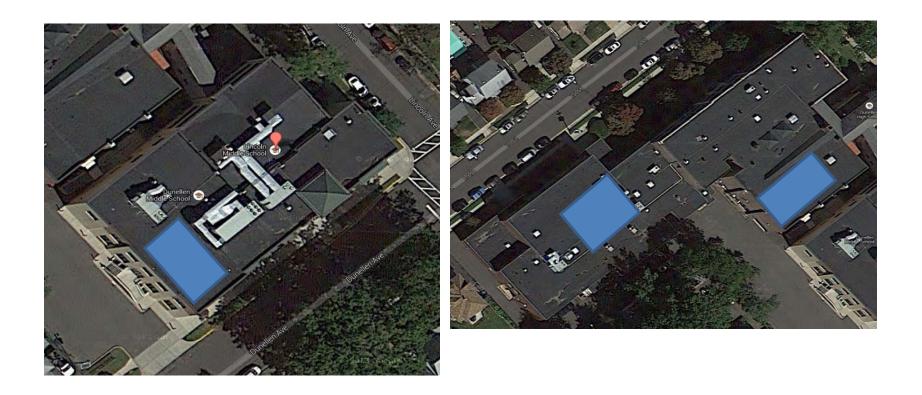
Faber Elementary School



# **DUNELLEN SCHOOLS - SOLAR ENERGY ANALYSIS**

Lincoln Middle School

Dunellen High School



Electric Cost \$0.16 SREC \$0.10 Total \$0.26 Energy Cost Annual Escalation Capacity Loss 0.50%

3%

Faber Elementary School

Year	Investment	Electric Generation kWh	Energy Cost Savings	Maint Cost	Net Cas Flow	Cumlative Cash Flow
0	\$81,900	0	0	0	(\$81,900)	0
1	0	27,318	\$6,977	0	\$6,977	(\$74,923)
2	0	27,182	\$7,150	0	\$7,150	(\$67,774)
3	0	27,045	\$7,327	0	\$7,327	(\$60,446)
4	0	26,909	\$7,509	0	\$7,509	(\$52,937)
5	0	26,772	\$7,695	258	\$7,695	(\$45,242)
6	0	26,635	\$7,886	257	\$7,886	(\$37,356)
7	0	26,499	\$8,080	255	\$8,080	(\$29,276)
8	0	26,362	\$8,280	254	\$8,280	(\$20,996)
9	0	26,226	\$8,484	253	\$8,484	(\$12,512)
10	0	26,089	\$8,693	251	\$8,693	(\$3,819)
11	0	25,952	\$8,907	250	\$8,907	\$5,088
12	0	25,816	\$9,126	249	\$9,126	\$14,214
13	0	25,679	\$9,350	248	\$9,350	\$23,564
14	0	25,543	\$9,579	247	\$9,579	\$33,144
15	0	25,406	\$9,814	245	\$9,814	\$42,958
16	0	25,270	\$10,054	244	\$10,054	\$53,012
17	0	25,133	\$10,300	243	\$10,300	\$63,311
18	0	24,996	\$10,551	242	\$10,551	\$73,862
19	0	24,860	\$10,808	240	\$10,808	\$84,670
20	0	24,723	\$11,071	239	\$11,071	\$95,742
21	0	24,587	\$11,340	238	\$11,340	\$107,082
22	0	24,450	\$11,616	237	\$11,616	\$118,698
23	0	24,313	\$11,897	236	\$11,897	\$130,595
24	0	24,177	\$12,185	234	\$12,185	\$142,780
25	0	24,040	\$12,480	233	\$12,480	\$155,260
					\$237,160	\$738,700
					Net Present Value	\$56,925
					Internal Rate of Return	6.49%

Electric Cost SREC Total Energy Cost Annual Escalation Capacity Loss

\$0.16 \$0.10 \$0.26 1 3%

0.50%

Lincoln Middle School

Year	Investment	Electric Generation kWh	Energy Cost Savings	Maint Cost	Net Cas Flow	Cumlative Cash Flow
0	\$42,900	0	0	0	(\$42,900)	0
1	0	14,310	\$3,689	0	\$3,689	(\$39,211)
2	0	14,238	\$3,780	0	\$3,780	(\$35,431)
3	0	14,167	\$3,874	0	\$3,874	(\$31,557)
4	0	14,095	\$3,970	0	\$3,970	(\$27,587)
5	0	14,023	\$4,069	135	\$4,069	(\$23,518)
6	0	13,952	\$4,169	134	\$4,169	(\$19,349)
7	0	13,880	\$4,272	134	\$4,272	(\$15,077)
8	0	13,809	\$4,378	133	\$4,378	(\$10,699)
9	0	13,737	\$4,486	132	\$4,486	(\$6,214)
10	0	13,666	\$4,596	132	\$4,596	(\$1,617)
11	0	13,594	\$4,709	131	\$4,709	\$3,092
12	0	13,523	\$4,825	130	\$4,825	\$7,917
13	0	13,451	\$4,943	130	\$4,943	\$12,860
14	0	13,380	\$5,065	129	\$5,065	\$17,925
15	0	13,308	\$5,189	128	\$5,189	\$23,114
16	0	13,236	\$5,316	128	\$5,316	\$28,430
17	0	13,165	\$5,446	127	\$5,446	\$33,875
18	0	13,093	\$5,578	127	\$5,578	\$39,454
19	0	13,022	\$5,714	126	\$5,714	\$45,168
20	0	12,950	\$5,854	125	\$5,854	\$51,022
21	0	12,879	\$5,996	125	\$5,996	\$57,017
22	0	12,807	\$6,141	124	\$6,141	\$63,159
23	0	12,736	\$6,290	123	\$6,290	\$69,449
24	0	12,664	\$6,443	123	\$6,443	\$75,892
25	0	12,592	\$6,598	122	\$6,598	\$82,490
					\$125,390	\$400,602
				]	Net Present Value	\$30,483
				·	Internal Rate of Return	6.68%

Electric Cost SREC Total Energy Cost Annual Escalation Capacity Loss

\$0.17

\$0.10

\$0.27

0.50%

3%

Dunellen High School

				0.995		
Year	Investment	Electric Generation kWh	Energy Cost Savings	Maint Cost	Net Cas Flow	Cumlative Cash Flov
0	\$127,400	0	0	0	(\$127,400)	0
1	0	42,495	\$11,341	0	\$11,341	(\$116,059)
2	0	42,283	\$11,623	0	\$11,623	(\$104,436)
3	0	42,070	\$11,911	0	\$11,911	(\$92,525)
4	0	41,858	\$12,207	0	\$12,207	(\$80,318)
5	0	41,645	\$12,509	401	\$12,509	(\$67,809)
6	0	41,433	\$12,819	399	\$12,819	(\$54,991)
7	0	41,220	\$13,135	397	\$13,135	(\$41,855)
8	0	41,008	\$13,460	395	\$13,460	(\$28,396)
9	0	40,795	\$13,792	393	\$13,792	(\$14,604)
10	0	40,583	\$14,131	391	\$14,131	(\$472)
11	0	40,371	\$14,479	389	\$14,479	\$14,007
12	0	40,158	\$14,835	387	\$14,835	\$28,842
13	0	39,946	\$15,199	385	\$15,199	\$44,041
14	0	39,733	\$15,572	383	\$15,572	\$59,613
15	0	39,521	\$15,953	382	\$15,953	\$75,567
16	0	39,308	\$16,344	380	\$16,344	\$91,910
17	0	39,096	\$16,743	378	\$16,743	\$108,653
18	0	38,883	\$17,152	376	\$17,152	\$125,805
19	0	38,671	\$17,570	374	\$17,570	\$143,374
20	0	38,458	\$17,997	372	\$17,997	\$161,372
21	0	38,246	\$18,435	370	\$18,435	\$179,806
22	0	38,033	\$18,882	368	\$18,882	\$198,689
23	0	37,821	\$19,340	367	\$19,340	\$218,029
24	0	37,608	\$19,808	365	\$19,808	\$237,837
25	0	37,396	\$20,287	363	\$20,287	\$258,124
					\$385,524	\$1,344,204
					Net Present Value	\$98,051
					Internal Rate of Return	7.39%