

CHANGE ORDER

Project: Performance Contract
Valley Stream UFSD 13
585 N. Corona Avenue
Valley Stream, New York 11580

Change Order Number: 1

Date: 4/5/2018

Agreement Date: 1/17/17

To Customer: Valley Stream UFSD 13
Proposal No. VSUFSD13120816

Agreement For: EPC

The Parties hereby agree to modify the above-referenced Agreement (the "Agreement") as set forth below. Except as modified herein, all other terms and conditions of the Agreement will remain unchanged and in full force and effect.

The Agreement is changed as follows:

Following the formal review by the State Education Department the following contract documents have been modified – Attachment G, Exhibit G-5, and Exhibit G-6. The new amended documents are enclosed within and are titled Attachment G – CO #1, Exhibit G-5 – CO #1, and Exhibit G-6 – CO #1 accordingly. These documents shall replace the previous ones in their entirety.

Attachment A (Scope of Work) shall be modified as follows:

Under ECM 1 (LED Lighting Upgrade) add item 10) as follows – "LED retrofit work shall comply with items 1.a.i., 1.a.ii., and 1.a.iii. of the NY State Education Department's Document titled Eligibility of Building Aid for Fluorescent and LED Lighting Retrofits dated February 1, 2017." Item 9) shall be removed in its entirety and replaced with the following:

- 9) The warranty for the lighting is as follows:
- a) Linear LED lamps are covered by a manufacturer warranty for a period of ten (10) years for 2', 3', and 4' linear LED Lamps.
 - b) Screw in PAR LED lamps are covered by a manufacturer warranty for a period of five (5) years.
 - c) Screw in A-Line LED lamps are covered by a manufacturer warranty for a period of three (3) years.
 - d) LED fixture drivers are covered by a manufacturer warranty for a period of five (5) years for LSI fixtures, or ten (10) years for Deco fixtures.
 - e) LED line voltage battery backups are covered by a manufacturer warranty for a period of seven (7) years.
 - f) LED recessed can kits are covered by a manufacturer warranty for a period of five (5) years.
 - g) Exit signs are covered by a manufacturer warranty for a period of five (5) years.

Attachment F (Energy Guarantee), section 5.7 shall be replaced with the following – "Honeywell shall assist the customer in the completion of applications for rebates with PSEG and National Grid during the construction period of the project. Honeywell shall guarantee at least \$5,000 in rebate monies be paid by these utilities directly to the District. In the event the actual total of these rebate monies is less than \$5,000,

Honeywell will reduce its contract price in the amount of the difference between \$5,000 and the actual total rebate amount received by the District.”

The following provision will be added to Article 11 (Miscellaneous Provisions) of the Agreement:

11.17 HONEYWELL and the CUSTOMER acknowledge that this Contract is subject to 8 NYCRR 155.20 and, as such, is subject to approval by the Commissioner of Education of the State of New York. This agreement shall not be executory until approval of the Commissioner is obtained.

	Total
The original Contract Sum was.....	\$ <u>3,709,300</u>
Net change by previously authorized Change Orders.....	\$ <u>0</u>
The Contract Sum prior to this Change Order was.....	\$ <u>3,709,300</u>
The Contract Sum will be unchanged by this Change Order in the amount of.....	\$ <u>0</u>
The new Contract Sum including this Change Order will be..	\$ <u>3,709,300</u>
The Contract Time will be unchanged by.....	<u>(0) calendar days</u>
The original Guarantee was.....	\$ <u>4,369,869</u>
Net change by previously authorized Change Orders	\$ <u>0</u>
The Guarantee prior to this Change Order was.....	\$ <u>4,369,869</u>
The Guarantee will be increased by this Change Order in the amount of.....	\$ <u>125,891</u>
The new Guarantee including this Change Order will be.....	\$ <u>4,495,760</u>

Honeywell International Inc.
115 Tabor Road
Morris Plains, New Jersey 07950

Valley Stream UFSD 13
585 N. Corona Avenue
Valley Stream, NY 11580

By: _____

By: _____

Date: _____

Date: _____

**ATTACHMENT G – CO #1
SCHEDULE OF SAVINGS**

1. Schedule of Savings

The total energy and operational Cost Avoidance over the Term of the contract is equal to or greater than \$4,495,760 as defined in the table below:

YEAR	ENERGY	OPERATIONAL	TOTAL
1	\$198,285	\$16,312	\$214,597
2	\$201,713	\$16,638	\$218,351
3	\$205,201	\$16,971	\$222,172
4	\$208,751	\$17,310	\$226,061
5	\$212,364	\$17,656	\$230,020
6	\$216,040	\$18,009	\$234,049
7	\$219,782	\$18,370	\$238,151
8	\$223,589	\$18,737	\$242,326
9	\$227,464	\$19,112	\$246,576
10	\$231,408	\$19,494	\$250,902
11	\$235,422	\$19,884	\$255,306
12	\$239,506	\$20,281	\$259,788
13	\$243,664	\$20,687	\$264,351
14	\$247,894	\$21,101	\$268,995
15	\$252,200	\$21,523	\$273,723
16	\$256,583	\$21,953	\$278,536
17	\$261,043	\$22,392	\$283,435
18	\$265,582	\$22,840	\$288,422
TOTALS	\$4,146,490	\$349,270	\$4,495,760

Notes:

- 1) All ECMs include a 2% annual utility escalation
- 2) In addition to the point above, ECM 8 – Install Solar Photovoltaic Systems also includes a 0.50% annual degradation in production

or the sum of the Retrofit and Support Costs for such Guarantee Year, whichever is less. Provided further, in no event shall the cost avoidance guarantee provided herein exceed the total installation, maintenance, and financing costs for the Work under this Agreement. Proforma budget neutral or positive cash flows are not guaranteed.

The Term of the Guarantee Performance Period is 18 years, subject to Attachment F.

1.1 Energy Savings. The first year amount of energy savings is the sum of the below listed ECMs. The schedule of savings does not include the absolute increase in energy use due to the implementation of measures to increase environmental comfort as directed by the customer, and other baseline adjustments (see 1.3.1.1). The Guaranteed savings are less than the projected savings, represented in Exhibit G-5. The Cost Avoidance is based on the listed Energy and Operational Cost Avoidance Guarantee Practices contained in Section 1.3 herein.

Att A No. [a]	ECM Description	Electric Year 1	Non-Electric Year 1	Total Year 1
1	LED Lighting Upgrade	\$42,173	\$(986)	\$41,187
2	Replace Air Handling Unit	\$ -	\$192	\$192
3	Replace Domestic Hot Water Heater	\$ -	\$254	\$254
4	Replace Pumps and Pump Motors	\$91	\$ -	\$91
5	Install Pipe Insulation	\$ -	\$675	\$675
6	Building Management System Upgrades	\$5,529	\$38,965	\$44,493
7	Desktop Computer Power Management	\$5,907	\$ -	\$5,907
8	Install Solar Photovoltaic Systems	\$105,486	\$ -	\$105,486
	Totals	\$159,185	\$39,100	\$198,285

[a] Att A: Attachment A, Scope of Work

Customer agrees that the baseline for the unit cost of energy will be adjusted each year of the guarantee term. This annually adjusted value of energy unit cost is stipulated as the new baseline in each succeeding year. Customer agrees that baseline adjustment is stipulated to be an escalation of 2% per year for the unit cost of electric utilities and 2% per year for gas utilities used in the determination of cost avoidance each year.

1.2 Operational Cost Savings. The annual guarantee of operational cost avoidance strategies are listed below. The Savings are based on the listed Energy and Operational Cost Avoidance Guarantee Practices contained in Section 1.3 herein. The verification methodology for the operational cost savings described below and identified in Section 1 shall be option A whereby the initial metric to be used shall be the Customer execution of the final delivery and acceptance certificate contained in Attachment J of the contract. The execution of this certificate is an indication that the equipment / systems have been installed and they operate and perform in accordance with the specifications and meet all functional tests. Beyond the initial year it is the responsibility of the Customer to insure the installed equipment continues to operate in accordance with the specified criteria throughout the term of the contract. The Customer acknowledges and agrees that, if it did not enter into this agreement, it would have to take future steps to achieve the same ends as does the work included in Attachment A of this contract, and that, in doing so, it would incur operational costs of at least the amount per year over the life of the performance period as presented below and in the Schedule of Savings. The Customer agrees that, by entering into this agreement, it will avoid future operational costs in at least these amounts.

Further, the Customer acknowledges that operational cost savings categorized as capital cost avoidance are part of, or are causally connected to scope of work specified in Attachment A (i.e., the ECMs being implemented), and are documented by industry standard engineering methodologies acceptable to the Customer.

Customer agrees that the baseline for the unit cost of operations will be adjusted each year of the guarantee term. This annually adjusted value of operational unit cost is stipulated as the new baseline in each succeeding year. Customer agrees that baseline adjustment is stipulated to be an escalation of 2% per year for operational costs used in the determination of operational cost avoidance each year.

The operational cost avoidance values were identified, reviewed, and agreed to by a team of Customer’s representatives including Gerard Antoine – Assistant Superintendent for Business and Human Resources and Jim Daly – Director of Facilities.

OSD #	Operational Savings Description (OSD)	Att. A Ref.	Cost Avoidance Category (O&M, Capital)	1 st Year Cost Avoidance
1	LED Lighting Upgrade	ECM 1	O&M	\$4,386
2	Replace Air Handling Unit	ECM 2	O&M	\$1,230
3	Building Management System Upgrades	ECM 6	O&M	\$10,696
Total				\$15,590

[a] O&M: Operations and Maintenance

1.3 Energy and Operational Cost Avoidance Guarantee Practices:

1.3.1 BASELINE Operating Parameters are the facility(s) and system(s) operations measured and/or observed before commencement of the Work. The data summarized will be used in the calculation of the baseline energy consumption and/or demand and for calculating baseline adjustments for changes in facility operation that occur during the Guarantee Period. HONEYWELL and CUSTOMER agree that the operating parameters specified in this section are representative of equipment operating characteristics during the Baseline Period specified in this Agreement. The following data was collected with the assistance of Jim Daly – Director of Facilities.

The Baseline Period is defined as July 2014 to June 2015 (Fiscal Year 2014/2015).

The Contractual Baseline consists of the Baseline Conditions and Baseline Operating Parameters collected from the Baseline Period and modified by Baseline Adjustments, as necessary, as defined herein and by the Exhibits to Attachment G.

Baseline operating parameters are stipulated in <Baseline Operating Parameters> attached hereto and incorporated herein as Exhibit G-1. See Energy Savings Calculations, attached hereto and incorporated herein as Exhibit G-5 for further information regarding stipulated baseline parameters.

1.3.1.1 Pre-Retrofit Baseline Adjustments: The following describes the adjustments that have been made during the determination of the Baseline, prior to the determination of the projected cost avoidance and the guaranteed cost avoidance. The adjustments are due to those projects included in Attachment A, or other known events, which increase energy use prior to the application of the ECMs.

A. None

Routine and non-routine future post-retrofit baseline adjustments are discussed in section 1.4.4.

1.3.2 GUARANTEE PERIOD Operating Parameters of the facility(s) and system(s) after completion of Work. The Customer agrees to operate, or cause to effect the operation of the Work in such manner that is in accordance with the Guaranteed Period Operating Parameters. The data summarized will be used in the calculation of the post-retrofit energy consumption and/or demand. HONEYWELL and CUSTOMER agree that the proposed operating parameters specified in this section are representative of equipment operating characteristics during the Guarantee Period specified in this Agreement. And, further, that they are agreed to be reasonable and may be used in the calculation of the cost avoidance, as if the site is actually operating per the parameters outlined in this section.

Guarantee Period operating parameters are stipulated in <Guarantee Period Operating Parameters> attached hereto and incorporated herein as Exhibit G-2.

1.3.2.1 Post-Retrofit Baseline Adjustments: The following describes known future events, events not captured in section 1.3.1.1., which generally increase energy use compared to the Baseline Period. This energy use is added to the baseline to determine an adjusted baseline against which the energy and energy cost avoidance will be determined. Energy increases are variable and dependent on the actual use of equipment.

A. None

1.3.3 Operational Cost Avoidance: The following parameters, methodologies, and/or calculations were used in determining the Operational Costs and/or avoided costs due to the Retrofit and Support Services implementation and are agreed to be reasonable and may be used in the calculation of the cost avoidance.

Operational cost avoidance methodology and/or calculation details are attached hereto and are incorporated herein as the exhibits outlined in the following table.

OSD #	Operational Savings Description	Cost Avoidance Methodology	Exhibit
1	LED Lighting Upgrade	The new LED lighting fixtures and retrofit kits being installed have a longer material life than the standard existing equipment. This translates into a longer Mean Time Between Failures (MTBF) thus resulting in a longer timeframe between equipment replacement periods.	G-6
2	Replace Air Handling Unit	Operational cost savings are a result of a reduction in the District's current repair dollar spend on the existing equipment.	G-6
3	Building Management System Upgrades	For the elimination of providing JACE license upgrades District-wide to match each and every PC JAVA upgrade implemented by their IT Department. Furthermore, the open protocol, open license, N4 JACE panels afford the District more cost effective preventive maintenance through competitive procurement amongst several authorized dealers.	G-6
The operational savings measures and which budget line items or invoice categories that are affected, are cross-referenced in each Operational Savings Cost Avoidance Detail in the Exhibits.			

[a] O&M: Operations and Maintenance

1.3.4 Other Energy and Operating Savings Measures: The following measures were not included in the guarantee, but may be used during the term in the determination of realized cost avoidance, or calculation of performance versus the guarantee, or to show value-add to the Customer:

Att A No.	Description of Attachment A Tasks not included in Sections 1.1 or 1.2 above
N/A	None

1.4 Guarantee Savings Measurement and Verification Plan

1.4.1 Measurement and Verification Methodology(s):

Energy Conservation Measure	Electric Savings Verification Method	Fuel Savings Verification Method	Operational Savings Verification Method
LED Lighting Upgrade	Option A	Option C	Option A
Replace Air Handling Unit	N/A	Option C	Option A
Replace Domestic Hot Water Heater	N/A	Option C	N/A
Replace Pumps and Pump Motors	Option A	N/A	N/A
Install Pipe Insulation	N/A	Option C	N/A
Building Management System Upgrades	Option A	Option C	Option A
Desktop Computer Power Management	Option A	N/A	N/A
Install Solar Photovoltaic Systems	Option A	N/A	N/A

A description of M&V options applicable to this program are included in the Measurement and Verification Options Matrix, attached hereto and incorporated herein as Exhibit G-7.

1.4.2 Energy Cost Avoidance: The following describes the Measurement and Verification procedures, formulas, and stipulated values which may be used in the calculation of the energy cost avoidance. The calculation of energy cost avoidance is based upon the utility rate paid during the Guarantee Year, or the Baseline Period utility rate, whichever produces the higher cost avoidance and/or as defined heretofore. Energy cost avoidance may also include, but is not limited to, Savings from demand charges, power factor correction, taxes, ratchet charges, rate changes and other utility tariff charges that are reduced as a result of the HONEYWELL involvement. The Customer is responsible for procuring a ratchet reset from the local utility company, as applicable. In case any ratchets are not reset the following adjustment will be made - energy cost avoidance will be calculated as if the ratchet has been reset at the end of the installation of electrical demand reducing ECMs.

1.4.2.1 Avoided Energy Costs: The Baseline utility rate structures are defined in Exhibit G-3. Electrical demand costs are based on average demand charges at that respective facility. Electrical energy costs are based on average electrical energy charges at that respective facility. Fuel prices are based on average prices for each facility for the baseline year. Energy rates are escalated during future years as described in Section 1.1.

1.4.3 Specific ECM M&V Plan(s): The following describes the Measurement and Verification procedures, formulas, and stipulated values which may be used in the determination of cost avoidance and/or performance against the Guarantee for this each specific ECM in addition to the general Energy Cost Avoidance procedure outlined in 1.4.2.

1.4.3.1 Table of Specific ECM M&V Plan Exhibits:

ECM	ECM Description	M&V Plan Exhibit
1	LED Lighting Upgrade	G-7
2	Replace Air Handling Unit	G-7
3	Replace Domestic Hot Water Heater	G-7
4	Replace Pumps and Pump Motors	G-7
5	Install Pipe Insulation	G-7
6	Building Management System Upgrades	G-7
7	Desktop Computer Power Management	G-7
8	Install Solar Photovoltaic Systems	G-7

1.4.4 Constants: The constants and/or stipulated values defined in the Exhibits to Attachment G, or as defined herein, are mutually agreed to by the Customer to be reasonable and may be used in the determination of the cost avoidance.

1.4.5 Exhibits and Schedules: The following Exhibits are attached hereto and are made a part of this Agreement by reference.

1.4.5.1 Exhibits

- Exhibit G-1 Baseline Operating Parameters
- Exhibit G-2 Guarantee Period Operating Parameters
- Exhibit G-3 Contractual Baseline Conditions, Utility Use, Utility Unit Costs

Exhibit G-4	Baseline Regression for Option C Meters
Exhibit G-5	Energy Savings Calculations
Exhibit G-6	Operations Cost Avoidance Methodology
Exhibit G-7	M&V Plan Descriptions
Exhibit G-8	Data Logging Results

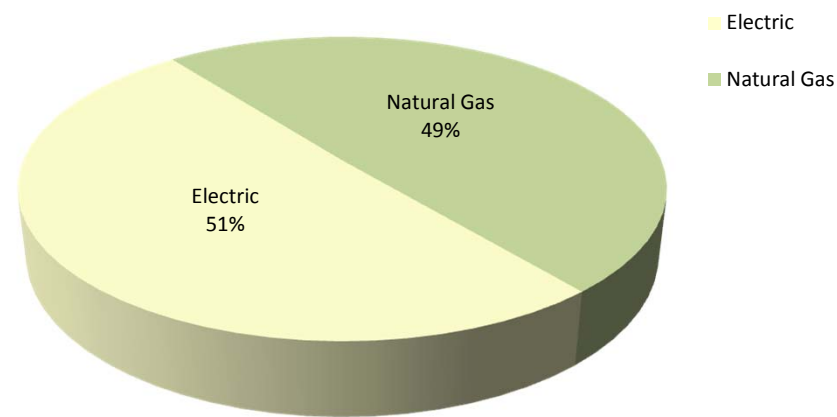
Exhibit G-5 - CO #1

Valley Stream UFSD 13
 Exhibit G-5-Baseline
 Utility Summary
 FY 14/15 (July 2014 - June 2015)

Building	Square Footage	Electric										Fuel Designation	Natural Gas				Total Thermal				Total Energy		
		Total Cost	Total kWh	Demand Cost	Total kW Demand	Demand Months	\$/kW	Blended Rate	Unblended Rate	\$ per Square Ft	Main Heating Utility	Total Cost	Total Therms	Blended Rate	\$ per Square Ft	Total Cost	MMBtu/Yr Total	\$/MMBtu	\$ per Square Ft	\$/Sq ft	kBtu/sq ft	Total Cost	
Howell Road ES	67,760	\$ 43,378	240,120	\$ 10,070	989	11	\$ 10.19	\$ 0.181	\$ 0.139	\$ 0.64	Natural Gas	\$ 47,412	59,800	\$ 0.793	\$ 0.70	\$ 47,412	5,980	\$ 7.93	\$ 0.70	\$ 1.34	100.3	\$ 90,790	
James A. Dever ES	65,101	\$ 42,781	238,500	\$ 10,078	1,064	11	\$ 9.48	\$ 0.179	\$ 0.137	\$ 0.66	Natural Gas	\$ 39,804	49,619	\$ 0.802	\$ 0.61	\$ 39,804	4,962	\$ 8.02	\$ 0.61	\$ 1.27	88.7	\$ 82,585	
Wheeler Avenue ES	71,388	\$ 37,978	205,440	\$ 9,158	902	11	\$ 10.16	\$ 0.185	\$ 0.140	\$ 0.53	Natural Gas	\$ 26,186	35,592	\$ 0.736	\$ 0.37	\$ 26,186	3,559	\$ 7.36	\$ 0.37	\$ 0.90	59.7	\$ 64,164	
Willow Road ES	69,699	\$ 35,048	197,520	\$ 8,316	818	11	\$ 10.17	\$ 0.177	\$ 0.135	\$ 0.50	Natural Gas	\$ 41,905	51,380	\$ 0.816	\$ 0.60	\$ 41,905	5,138	\$ 8.16	\$ 0.60	\$ 1.10	83.4	\$ 76,952	
TOTALS	273,948	\$ 159,185	881,580	\$ 37,621	3,771		\$ 9.98	\$ 0.181	\$ 0.138	\$ 0.58		\$ 155,307	196,391	\$ 0.791	\$ 0.57	\$ 155,307	19,639	\$ 7.91	\$ 0.57	\$ 1.15	82.7	\$ 314,492	

Electric	\$ 159,185
Natural Gas	\$ 155,307
Total	\$ 314,492

Utility Costs by Type



Heating Content of Fuels

Natural Gas	100,000	BTU/Therm
Fuel Oil #2	138,500	BTU/Gallon
Fuel Oil #4	145,000	BTU/Gallon
Fuel Oil #6	153,000	BTU/Gallon
Propane	91,500	BTU/CCF
Wood Chips	9,200,000	BTU/Ton
Wood Pellets	15,980,000	BTU/Ton

Exhibit G-5 - CO #1

Valley Stream UFSD 13
 Exhibit G-5-WD
 Weather Data - TMY 3 Hourly Records

COOLING

JFK International Airport, NY

All Months

Amb. Temp Bin [°F]	Ave Temp [°F]	01-08 Hours	09-16 Hours	17-24 Hours	WB [°F]	Enthalpy [BTU/lb]	Total Bin Hours
100 to 105	102.5	-	-	-	-	-	-
95 to 100	97.5	-	3	-	75.3	38.6	3
90 to 95	92.5	-	18	3	71.8	35.4	21
85 to 90	87.5	-	100	18	72.9	36.4	118
80 to 85	82.5	37	292	126	71.4	35.1	455
75 to 80	77.5	189	296	247	69.6	33.6	732
70 to 75	72.5	275	234	272	66.5	31.1	781
65 to 70	67.5	245	248	272	61.7	27.6	765
60 to 65	62.5	282	226	287	57.3	24.6	795
Total		1,028	1,417	1,225			3,670

JFK International Airport, NY

Cooling Months Only (April - September)

Amb. Temp Bin [°F]	Ave Temp [°F]	01-08 Hours	09-16 Hours	17-24 Hours	WB [°F]	Enthalpy [BTU/lb]	Total Bin Hours
100 to 105	102.5	-	-	-	-	-	-
95 to 100	97.5	-	3	-	75.3	38.6	3
90 to 95	92.5	-	18	3	71.8	35.4	21
85 to 90	87.5	-	100	18	72.9	36.4	118
80 to 85	82.5	37	292	126	71.4	35.1	455
75 to 80	77.5	189	289	247	69.7	33.7	725
70 to 75	72.5	275	200	270	66.6	31.2	745
65 to 70	67.5	236	184	245	61.7	27.5	665
60 to 65	62.5	232	158	196	56.9	24.3	586
Total		969	1,244	1,105			3,318

HEATING

JFK International Airport, NY

All Months

Amb. Temp Bin [°F]	Ave Temp [°F]	01-08 Hours	09-16 Hours	17-24 Hours	WB [°F]	Enthalpy [BTU/lb]	Total Bin Hours
55 to 60	57.5	259	225	246	52.1	21.4	730
50 to 55	52.5	236	228	217	47.6	18.9	681
45 to 50	47.5	158	206	181	42.9	16.6	545
40 to 45	42.5	320	280	332	39.1	14.8	932
35 to 40	37.5	395	283	367	34.0	12.6	1,045
30 to 35	32.5	239	120	167	29.1	10.5	526
25 to 30	27.5	109	76	81	23.4	8.3	266
20 to 25	22.5	100	51	72	18.9	6.7	223
15 to 20	17.5	58	29	25	14.6	5.3	112
10 to 15	12.5	10	5	6	9.5	3.6	21
5 to 10	7.5	8	-	1	5.3	2.4	9
0 to 5	2.5	-	-	-	-	-	-
-5 to 0	-2.5	-	-	-	-	-	-
-10 to -5	-7.5	-	-	-	-	-	-
-15 to -10	-12.5	-	-	-	-	-	-
Total		1,892	1,503	1,695			5,090

JFK International Airport, NY

Heating Months Only (October - March)

Amb. Temp Bin [°F]	Ave Temp [°F]	01-08 Hours	09-16 Hours	17-24 Hours	WB [°F]	Enthalpy [BTU/lb]	Total Bin Hours
55 to 60	57.5	60	127	96	51.2	20.9	283
50 to 55	52.5	110	178	125	47.2	18.8	413
45 to 50	47.5	108	164	121	42.7	16.5	393
40 to 45	42.5	240	251	280	39.0	14.7	771
35 to 40	37.5	355	282	362	34.0	12.5	999
30 to 35	32.5	239	120	167	29.1	10.5	526
25 to 30	27.5	109	76	81	23.4	8.3	266
20 to 25	22.5	100	51	72	18.9	6.7	223
15 to 20	17.5	58	29	25	14.6	5.3	112
10 to 15	12.5	10	5	6	9.5	3.6	21
5 to 10	7.5	8	-	1	5.3	2.4	9
0 to 5	2.5	-	-	-	-	-	-
-5 to 0	-2.5	-	-	-	-	-	-
-10 to -5	-7.5	-	-	-	-	-	-
-15 to -10	-12.5	-	-	-	-	-	-
Total		1,397	1,283	1,336			4,016

Exhibit G-5 - CO #1

Valley Stream UFSD 13
 Exhibit G-5-WD
 Weather Data - TMY 3 Hourly Records

BMS / Occupancy Schedules

Building	EXISTING				Summer Schedule
	Weekday Schedule		Weekend Schedule		
	Start Time	End Time	Start Time	End Time	
Howell Road ES	6:00 AM	6:00 PM			
James A. Dever ES	6:00 AM	6:00 PM			
Wheeler Avenue ES	6:00 AM	6:00 PM			
Willow Road ES	6:00 AM	6:00 PM			

PROPOSED			
Weekday Schedule		Weekend Schedule	
Start Time	End Time	Start Time	End Time
7:30 AM	3:30 PM		
7:30 AM	3:00 PM		
7:30 AM	3:30 PM		
7:00 AM	2:30 PM		

EXISTING								
Weekday Schedule			Weekend Schedule			Weighted		
01-08 Hours	09-16 Hours	17-24 Hours	01-08 Hours	09-16 Hours	17-24 Hours	01-08 Hours	09-16 Hours	17-24 Hours
2.0	8.0	2.0	-	-	-	0.18	0.71	0.18
2.0	8.0	2.0	-	-	-	0.18	0.71	0.18
2.0	8.0	2.0	-	-	-	0.18	0.71	0.18
2.0	8.0	2.0	-	-	-	0.18	0.71	0.18

PROPOSED								
Weekday Schedule			Weekend Schedule			Weighted		
01-08 Hours	09-16 Hours	17-24 Hours	01-08 Hours	09-16 Hours	17-24 Hours	01-08 Hours	09-16 Hours	17-24 Hours
0.5	7.5	-	-	-	-	0.04	0.67	-
0.5	7.0	-	-	-	-	0.04	0.63	-
0.5	7.5	-	-	-	-	0.04	0.67	-
1.0	6.5	-	-	-	-	0.09	0.58	-

Exhibit G-5 - CO #1

Valley Stream UFSD 13
Exhibit G-5-Summary
Energy Savings Summary

Utilities	Electric kWh	Electric kW	Natural Gas Therms	Fuel Oil Gallons	Propane Gallons	\$/yr
Electric	881,580	3,771	-	-	-	\$ 159,185
Natural Gas	-	-	196,391	-	-	\$ 155,307
Fuel Oil	-	-	-	-	-	\$ -
Total:	881,580	3,771	196,391	-	-	\$ 314,492

GLOBAL SAFETY FACTORS*

Global Electric Safety Factor [%] =	0.0%
Global Thermal Safety Factor [%] =	2.0%
Global Water Safety Factor [%] =	0.0%

*Applied over the entire project

GUARANTEED

	Savings	Baseline	
Electric	\$ 159,185	\$ 159,185	100.0%
Natural Gas	\$ 39,100	\$ 155,307	25.2%
Total	\$ 198,285	\$ 314,492	63.0%

GUARANTEED SAVINGS

ECM No.	Description	Total Guaranteed Energy Savings	% of Baseline Total Utility Cost	Guaranteed Energy Savings									
				ELECTRIC						NATURAL GAS			
				kWh Savings	kWh % Baseline	kW Savings	kW % of Baseline	Total \$\$ Savings	Electric \$ % Baseline	Therm Savings	Therm % Baseline	Therm \$\$ Savings	Therm \$ % Baseline
1	LED Lighting Upgrade	\$ 41,187	13.1%	231,695	26.3%	1,021.6	27.1%	\$ 42,173	26.5%	(1,257)	-0.6%	\$ (986)	-0.6%
2	Replace Air Handling Unit	\$ 192	0.1%	-	0.0%	-	0.0%	\$ -	0.0%	242	0.1%	\$ 192	0.1%
3	Replace Domestic Hot Water Heater	\$ 254	0.1%	-	0.0%	-	0.0%	\$ -	0.0%	317	0.2%	\$ 254	0.2%
4	Replace Pumps and Pump Motors	\$ 91	0.0%	462	0.1%	2.5	0.1%	\$ 91	0.1%	-	0.0%	\$ -	0.0%
5	Install Pipe Insulation	\$ 675	0.2%	-	0.0%	-	0.0%	\$ -	0.0%	918	0.5%	\$ 675	0.4%
6	Building Management System Upgrades	\$ 44,493	14.1%	40,065	4.5%	-	0.0%	\$ 5,529	3.5%	49,225	25.1%	\$ 38,965	25.1%
7	Desktop Computer Power Management	\$ 5,907	1.9%	42,828	4.9%	-	0.0%	\$ 5,907	3.7%	-	0.0%	\$ -	0.0%
8	Install Solar Photovoltaic Systems	\$ 105,486	33.5%	416,781	47.3%	263.2	7.0%	\$ 105,486	66.3%	-	0.0%	\$ -	0.0%
	Total:	\$ 198,285	63.0%	731,832	83.0%	1,287.3	34.1%	\$ 159,185	100.0%	49,445	25.2%	\$ 39,100	25.2%

Valley Stream UFSD 13
 Exhibit G-5-SIS
 Savings Interaction Summary

BOILER FUEL ADJUSTMENTS DUE TO INTERACTIVE ECMS

Fuel Adjustment (Therms) - Boiler load only

Include (Y/N)	ECM #	Unadjusted Baseline	Howell Road ES	James A. Dever ES	Wheeler Avenue ES	Willow Road ES
			59,800	49,619	35,592	51,380
	-	DHW Usage (% of Building Thermal Usage)	5.0%	5.0%	5.0%	5.0%
		DHW Baseline	2,990	2,481	1,780	2,569
		Adjusted Baseline	56,810	47,138	33,812	48,811
y	1	ECM 1 - LED Lighting Upgrade	-319	-303	-349	-287
		Adjusted Baseline	57,129	47,441	34,161	49,098
y	2	ECM 2 - Replace Air Handling Unit	242	0	0	0
		Adjusted Baseline	56,887	47,441	34,161	49,098
y	3	ECM 3 - Replace Domestic Hot Water Heater	0	317	0	0
		Adjusted Baseline	56,887	47,124	34,161	49,098
y	4	ECM 4 - Replace Pumps and Pump Motors	0	0	0	0
		Adjusted Baseline	56,887	47,124	34,161	49,098
y	5	ECM 5 - Install Pipe Insulation	0	0	918	0
		Adjusted Baseline	56,887	47,124	33,243	49,098
y	7	ECM 7 - Desktop Computer Power Management	0	0	0	0
		Adjusted Baseline	56,887	47,124	33,243	49,098
y	8	ECM 8 - Install Solar Photovoltaic Systems	0	0	0	0
		Adjusted Baseline	56,887	47,124	33,243	49,098
y	6	ECM 6 - Building Management System Upgrades	14,447	12,402	8,610	13,766
		Adjusted Baseline	42,441	34,722	24,633	35,331

Exhibit G-5 - CO #1

Valley Stream UFSD 13
Exhibit G-5-1
ECM 1 - LED Lighting Upgrade

ECM DESCRIPTION

Upgrades existing lighting with state of the art, high efficiency LED lighting.

DATA / ASSUMPTIONS

Heating Season Length [Weeks]	20
* Percent of Heating Season [%]	38%
** Fraction of Heat to be Made-Up [%]	40%
Heating Season Length [Hours]	4,016

* Fraction of the year representing the heating season, as there are times during the year when the building is neither heated nor cooled.

** Fraction of the lighting reduction that has to be made up by the heating system; a portion of the lighting heat is released at night plus interior zones will have limited heating loads

Cooling Season Length [Weeks]	16
Percent of Cooling Season [%]	31%
Fraction of Cooling Avoided [%]	0%
Average Cooling Equipment COP	-

COMMISSIONING

Confirm lighting operation and occupancy sensor functionality

RECOVERY/SAFETY FACTOR

Electric Safety Factor [%] =	0%
Thermal Safety Factor [%] =	0%

FORMULAE

$$C_{SAVINGS} = kW_{PROPOSED} \cdot (T \cdot C_{\%})$$

$$L_{SAVINGS} = kW_{SAVINGS} \cdot T$$

$$kW_{SAVINGS} = kW_{EXISTING} - kW_{PROPOSED}$$

$$H_{PENALTY} = (T_{EQUIVALENT} \cdot \%_{HEAT-SEASON} \cdot \%_{MAKE-UP}) / \eta_{HEATING}$$

$$T_{EQUIVALENT} = (L_{SAVINGS} + C_{SAVINGS}) \cdot 3,412 / 100,000$$

Exhibit G-5 - CO #1

Valley Stream UFSD 13
 Exhibit G-5-1
 ECM 1 - LED Lighting Upgrade

Variable	Units	Description
C _{SAVINGS}	kWh	Lighting consumption savings from lighting controls
L _{SAVINGS}	kWh	Lighting consumption savings
C _%	%	Percent reduction in lighting hours of operation with lighting controls
T	Hours	Annual lighting hours of operation
kW _{SAVINGS}	kW	Total lighting power savings
kW _{PROPOSED}	kW	Total proposed lighting power draw
kW _{EXISTING}	kW	Total existing lighting power draw
H _{PENALTY}	Therms	Total heating penalty
T _{EQUIVALENT}	Therms	Therm equivalent of lighting consumption savings
% _{MAKE-UP}	%	Fraction of heat to be made up
% _{HEAT-SEASON}	%	Percentage heating season of entire year
η _{HEATING}	%	Heating system efficiency

CALCULATIONS

Detailed energy savings calculations are in the line-by-line calculation sheet

*Inputs are blue

Building	Lighting Consumption Savings [kWh]	Controls Consumption Savings [kWh]	Lighting Demand Savings [kW]	Proposed Boiler Efficiency [%]
Howell Road ES	59,457	-	24.3	78.5%
James A. Dever ES	57,552	-	24.4	78.5%
Wheeler Avenue ES	62,026	-	23.7	78.5%
Willow Road ES	52,660	-	20.5	78.5%
Totals	231,695	-	92.9	

Exhibit G-5 - CO #1

Valley Stream UFSD 13
 Exhibit G-5-1
 ECM 1 - LED Lighting Upgrade

CALCULATIONS

	Howell Road ES	James A. Dever ES	Wheeler Avenue ES	Willow Road ES
Lighting Derate [%]	0%	0%	0%	0%
Lighting Savings [kWh]	59,457	57,552	62,026	52,660
kW Savings [kW]	24.3	24.4	23.7	20.5
Heating Season [Weeks/Year]	20	20	20	20
* % of Heating Season [%]	38%	38%	38%	38%
**Fraction of Heat to be Made-Up [%]	40%	40%	40%	40%
Equivalent of Lighting kWh Saved in Therms [Therms/Yr]	1,661	1,576	1,816	1,492
Proposed Boiler Efficiency [%]	78.5%	78.5%	78.5%	78.5%
Heating Penalty [Therms]	(326)	(309)	(356)	(292)
Cooling Season [Weeks/Year]	16	16	16	16
% of Cooling Season [%]	31%	31%	31%	31%
Fraction of Cooling Avoided [%]	0%	0%	0%	0%
Cooling Equipment COP	-	-	-	-
Cooling Savings [kWh]	-	-	-	-

SAVINGS SUMMARY

Building ID	kWh Savings	kW Savings	Thermal Savings	Safety Factor
	kWh	kW	Therms	%
Howell Road ES	59,457	24.3	(326)	0.0%
James A. Dever ES	57,552	24.4	(309)	0.0%
Wheeler Avenue ES	62,026	23.7	(356)	0.0%
Willow Road ES	52,660	20.5	(292)	0.0%
Subtotal	231,695	92.9	(1,283)	

Exhibit G-5 - CO #1

Valley Stream UFSD 13
Exhibit G-5-1
ECM 1 - LED Lighting Upgrade
Lighting Line by Line

Site Name	Building Name	Index	Floor	Location	Existing Code	Proposed Code	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Existing Foot Candles	Volts	Included in Project	Hour Code	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Valley Stream School District NY	Howell Road Elementary School	1	1	Office 32	1424T8-28	LT24	5	5	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	50	120	TRUE	103	2,639	0.22	0.11	0.11	567	277	290
Valley Stream School District NY	Howell Road Elementary School	2	1	Bathroom 33	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	25	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Howell Road Elementary School	3	1	Office 34	1424T8-28	LT24	6	6	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	50	120	TRUE	25	2,054	0.26	0.13	0.13	530	259	271
Valley Stream School District NY	Howell Road Elementary School	4	1	Office 35	1424T8-28	LT24	4	4	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	50	120	TRUE	125	1,752	0.17	0.08	0.09	301	147	154
Valley Stream School District NY	Howell Road Elementary School	5	1	Bathroom 36	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	25	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Howell Road Elementary School	6	1	Nurse 37	1424T8-28	LT24	6	6	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	50	120	TRUE	25	2,054	0.26	0.13	0.13	530	259	271
Valley Stream School District NY	Howell Road Elementary School	7	1	Nurse 38	1424T8-28	LT24	4	4	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	50	120	TRUE	25	2,054	0.17	0.08	0.09	353	173	181
Valley Stream School District NY	Howell Road Elementary School	8	1	Bathroom 39	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	25	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Howell Road Elementary School	9	1	Bathroom 40	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	25	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Howell Road Elementary School	10	1	Teachers Lounge 41	1424T8-28	LT24	12	12	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	36	120	TRUE	108	4,001	0.52	0.25	0.26	2,065	1,008	1,056
Valley Stream School District NY	Howell Road Elementary School	11	1	Kitchen 42	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	25	120	TRUE	8	4,001	0.04	0.02	0.02	172	84	88
Valley Stream School District NY	Howell Road Elementary School	12	1	Storage 43	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	16	120	TRUE	7	851	0.03	0.02	0.02	29	14	15
Valley Stream School District NY	Howell Road Elementary School	13	1	Office 44	1424T8-28	LT24	4	4	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	28	120	TRUE	125	1,752	0.17	0.08	0.09	301	147	154
Valley Stream School District NY	Howell Road Elementary School	14	1	Classroom K1	1424T8-28	LT24	24	24	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	45	120	TRUE	125	1,752	1.03	0.50	0.53	1,808	883	925
Valley Stream School District NY	Howell Road Elementary School	15	1	Classroom K1 Bath	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	25	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Howell Road Elementary School	16	1	Classroom K2	1424T8-28	LT24	16	16	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	45	120	TRUE	125	1,752	0.69	0.34	0.35	1,205	589	617
Valley Stream School District NY	Howell Road Elementary School	17	1	Classroom K2 Storage	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	16	120	TRUE	7	851	0.03	0.02	0.02	29	14	15
Valley Stream School District NY	Howell Road Elementary School	18	1	Classroom K2 Bath	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	25	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Howell Road Elementary School	19	1	Classroom K3	1424T8-28	LT24	18	18	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	55	120	TRUE	125	1,752	0.77	0.38	0.40	1,356	662	694
Valley Stream School District NY	Howell Road Elementary School	20	1	Classroom K3 Storage	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	16	120	TRUE	7	851	0.03	0.02	0.02	29	14	15
Valley Stream School District NY	Howell Road Elementary School	21	1	Classroom K3 Bath	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	25	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Howell Road Elementary School	22	1	Classroom K4	1424T8-28	LT24	18	18	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	55	120	TRUE	125	1,752	0.77	0.38	0.40	1,356	662	694
Valley Stream School District NY	Howell Road Elementary School	23	1	Classroom K4 Storage	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	16	120	TRUE	7	851	0.03	0.02	0.02	29	14	15
Valley Stream School District NY	Howell Road Elementary School	24	1	Classroom K4 Bath	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	25	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Howell Road Elementary School	25	1	Classroom 21	1424T8-28	LT24	16	16	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.69	0.34	0.35	1,205	589	617
Valley Stream School District NY	Howell Road Elementary School	26	1	Classroom 21 Storage	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	16	120	TRUE	7	851	0.03	0.02	0.02	29	14	15
Valley Stream School District NY	Howell Road Elementary School	27	1	Classroom 21 Bath	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	25	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Howell Road Elementary School	28	1	Storage 19	1424T8-28	LT24	4	4	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	7	851	0.17	0.08	0.09	146	71	75
Valley Stream School District NY	Howell Road Elementary School	29	1	Classroom 17	1424T8-28	LT24	12	12	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.52	0.25	0.26	904	442	463
Valley Stream School District NY	Howell Road Elementary School	30	1	Classroom 17 Bath	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	25	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Howell Road Elementary School	31	1	Classroom 15	1424T8-28	LT24	12	12	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.52	0.25	0.26	904	442	463
Valley Stream School District NY	Howell Road Elementary School	32	1	Classroom 15 Bath	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	25	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72

Exhibit G-5 - CO #1

Valley Stream UFSD 13
Exhibit G-5-1
ECM 1 - LED Lighting Upgrade
Lighting Line by Line

Site Name	Building Name	Index	Floor	Location	Existing Code	Proposed Code	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Existing Foot Candles	Volts	Included in Project	Hour Code	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Valley Stream School District NY	Howell Road Elementary School	33	1	Classroom 13	1424T8-28	LT24	12	12	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.52	0.25	0.26	904	442	463
Valley Stream School District NY	Howell Road Elementary School	34	1	Classroom 13 Bath	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	25	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Howell Road Elementary School	35	1	Classroom 11	1424T8-28	LT24	12	12	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.52	0.25	0.26	904	442	463
Valley Stream School District NY	Howell Road Elementary School	36	1	Classroom 11 Bath	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	25	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Howell Road Elementary School	37	1	Classroom 9	1424T8-28	LT24	12	12	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.52	0.25	0.26	904	442	463
Valley Stream School District NY	Howell Road Elementary School	38	1	Library 20	2232T8	LT32	17	17	0.0510	0.0240	2x2, 3-Lamp T8	LED Int. Driver Lamps, (3) 2' Lamps	50	120	TRUE	25	2,054	0.87	0.41	0.46	1,781	838	943
Valley Stream School District NY	Howell Road Elementary School	39	1	Library 20	2232T8BB	LT32MI	17	17	0.0510	0.0240	2x2, 3-Lamp T8, BB	LED Int. Driver Lamps, (3) 2' Lamps, MI	50	120	TRUE	25	2,054	0.87	0.41	0.46	1,781	838	943
Valley Stream School District NY	Howell Road Elementary School	40	1	Library 20	PL2X26-6	LK6C-14F-120V	8	8	0.0560	0.0140	CF PL (2) 26w	LED Kit, 6 Inch Can, 14w, Fixed Output	12	120	TRUE	25	2,054	0.45	0.11	0.34	920	230	690
Valley Stream School District NY	Howell Road Elementary School	41	1	Library 20	PL2X26-6	LK6C-14F-120V	6	6	0.0560	0.0140	CF PL (2) 26w	LED Kit, 6 Inch Can, 14w, Fixed Output	12	120	TRUE	25	2,054	0.34	0.08	0.25	690	173	518
Valley Stream School District NY	Howell Road Elementary School	42	1	Library 20	1884T8-28	LT84	6	6	0.1720	0.0840	1x8, 8-Lamp T8, 28w	LED Int. Driver Lamps, (8) 4' Lamps	50	120	TRUE	25	2,054	1.03	0.50	0.53	2,120	1,035	1,085
Valley Stream School District NY	Howell Road Elementary School	43	1	Library 20	K-LED	NR	3	3	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.01	0.01	-	105	105	-
Valley Stream School District NY	Howell Road Elementary School	44	1	Office 22	2424T8-28	LT24	1	1	0.0430	0.0210	2x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	25	120	TRUE	25	2,054	0.04	0.02	0.02	88	43	45
Valley Stream School District NY	Howell Road Elementary School	45	1	Bathroom 24	222UT8	LT22R22	1	1	0.0580	0.0160	2x2, 2-Lamp U T8	LED Int. Driver Lamps, (2) 2' Lamps, 2x2 Refl	29	120	TRUE	15	4,001	0.06	0.02	0.04	232	64	168
Valley Stream School District NY	Howell Road Elementary School	46	1	Hallway Library	2232T8	LT32	8	8	0.0510	0.0240	2x2, 3-Lamp T8	LED Int. Driver Lamps, (3) 2' Lamps	25	120	TRUE	12	4,001	0.41	0.19	0.22	1,632	768	864
Valley Stream School District NY	Howell Road Elementary School	47	1	Hallway Library	PL2X26-6	LK6C-14F-120V	3	3	0.0560	0.0140	CF PL (2) 26w	LED Kit, 6 Inch Can, 14w, Fixed Output	25	120	TRUE	12	4,001	0.17	0.04	0.13	672	168	504
Valley Stream School District NY	Howell Road Elementary School	48	1	Hallway Library	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.01	0.01	-	70	70	-
Valley Stream School District NY	Howell Road Elementary School	49	1	Classroom 7	1424T8-28	LT24	12	12	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.52	0.25	0.26	904	442	463
Valley Stream School District NY	Howell Road Elementary School	50	1	Classroom 5	1424T8-28	LT24	12	12	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.52	0.25	0.26	904	442	463
Valley Stream School District NY	Howell Road Elementary School	51	1	Classroom 3	1424T8-28	LT24	12	12	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.52	0.25	0.26	904	442	463
Valley Stream School District NY	Howell Road Elementary School	52	1	Classroom 1	1424T8-28	LT24	12	12	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.52	0.25	0.26	904	442	463
Valley Stream School District NY	Howell Road Elementary School	53	1	Office 28	1424T8-28	LT24	2	2	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.09	0.04	0.04	151	74	77
Valley Stream School District NY	Howell Road Elementary School	54	1	Multi-purpose Room 26	2424T8-28	LT24	24	24	0.0430	0.0210	2x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	20	120	TRUE	25	2,054	1.03	0.50	0.53	2,120	1,035	1,085
Valley Stream School District NY	Howell Road Elementary School	55	1	Multi-purpose Room 26	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.01	0.01	-	70	70	-
Valley Stream School District NY	Howell Road Elementary School	56	1	Stage 30	1424T8-28	LT24	5	5	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	25	120	TRUE	25	2,054	0.22	0.11	0.11	442	216	226
Valley Stream School District NY	Howell Road Elementary School	57	1	Lobby Multi-purpose Room	2424T8-28	LT24	6	6	0.0430	0.0210	2x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	25	120	TRUE	12	4,001	0.26	0.13	0.13	1,032	504	528
Valley Stream School District NY	Howell Road Elementary School	58	1	Lobby Multi-purpose Room	1414T8BB-28	LT14MI	1	1	0.0220	0.0105	1x4, 1-Lamp T8, BB, 28w	LED Int. Driver Lamp, (1) 4' Lamp, MI	25	120	TRUE	12	4,001	0.02	0.01	0.01	88	42	46
Valley Stream School District NY	Howell Road Elementary School	59	1	Lobby Multi-purpose Room	1222T8	LT22	2	2	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	25	120	TRUE	12	4,001	0.07	0.03	0.04	272	128	144
Valley Stream School District NY	Howell Road Elementary School	60	1	Lobby Multi-purpose Room	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.01	0.01	-	70	70	-
Valley Stream School District NY	Howell Road Elementary School	61	1	Classroom 2	1424T8-28	LT24	12	12	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.52	0.25	0.26	904	442	463
Valley Stream School District NY	Howell Road Elementary School	62	1	Classroom 4	1424T8-28	LT24	12	12	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.52	0.25	0.26	904	442	463
Valley Stream School District NY	Howell Road Elementary School	63	1	Classroom 6	1424T8-28	LT24	12	12	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.52	0.25	0.26	904	442	463
Valley Stream School District NY	Howell Road Elementary School	64	1	Classroom 8	1424T8-28	LT24	12	12	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.52	0.25	0.26	904	442	463

Exhibit G-5 - CO #1

Valley Stream UFSD 13
Exhibit G-5-1
ECM 1 - LED Lighting Upgrade
Lighting Line by Line

Site Name	Building Name	Index	Floor	Location	Existing Code	Proposed Code	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Existing Foot Candles	Volts	Included in Project	Hour Code	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Valley Stream School District NY	Howell Road Elementary School	65	1	Bathroom, Women's 8a	1414T8-28	LT14	3	3	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	25	120	TRUE	15	4,001	0.07	0.03	0.03	264	126	138
Valley Stream School District NY	Howell Road Elementary School	66	1	Jc 8b	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	20	120	TRUE	7	851	0.04	0.02	0.02	37	18	19
Valley Stream School District NY	Howell Road Elementary School	67	1	Bathroom 8c	1212T8	LT12	1	1	0.0200	0.0080	1x2, 1-Lamp T8	LED Int. Driver Lamp, (1) 2' Lamp	12	120	TRUE	15	4,001	0.02	0.01	0.01	80	32	48
Valley Stream School District NY	Howell Road Elementary School	68	1	Bathroom, Men's 8d	1414T8-28	LT14	3	3	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	25	120	TRUE	15	4,001	0.07	0.03	0.03	264	126	138
Valley Stream School District NY	Howell Road Elementary School	69	1	Storage 8e	1424T8-28	LT24	2	2	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	25	120	TRUE	7	851	0.09	0.04	0.04	73	36	37
Valley Stream School District NY	Howell Road Elementary School	70	1	Classroom 10	1424T8-28	LT24	12	12	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.52	0.25	0.26	904	442	463
Valley Stream School District NY	Howell Road Elementary School	71	1	Classroom 12	1424T8-28	LT24	12	12	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.52	0.25	0.26	904	442	463
Valley Stream School District NY	Howell Road Elementary School	72	1	Classroom 14	1424T8-28	LT24	12	12	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.52	0.25	0.26	904	442	463
Valley Stream School District NY	Howell Road Elementary School	73	1	Classroom 14 Bath	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	25	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Howell Road Elementary School	74	1	Classroom 16	1424T8-28	LT24	20	20	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	60	120	TRUE	125	1,752	0.86	0.42	0.44	1,507	736	771
Valley Stream School District NY	Howell Road Elementary School	75	1	Mechanical Room 45	1424T8-28	LT24	7	7	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	20	120	TRUE	7	851	0.30	0.15	0.15	256	125	131
Valley Stream School District NY	Howell Road Elementary School	76	1	Mechanical Room 45	1424T8EM-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, EM on, 28w	LED Int. Driver Lamps, (2) 4' Lamps	20	120	TRUE	1	8,760	0.04	0.02	0.02	377	184	193
Valley Stream School District NY	Howell Road Elementary School	77	1	Mechanical Room 45	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.01	0.01	-	70	70	-
Valley Stream School District NY	Howell Road Elementary School	78	1	Hallway 2 To 17	2424T8-28	LT24	31	31	0.0430	0.0210	2x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	20	120	TRUE	12	4,001	1.33	0.65	0.68	5,333	2,605	2,729
Valley Stream School District NY	Howell Road Elementary School	79	1	Hallway 2 To 17 Display	1313T8	LT13	2	2	0.0260	0.0120	1x3, 1-Lamp T8	LED Int. Driver Lamp, (1) 3' Lamp	20	120	TRUE	12	4,001	0.05	0.02	0.03	208	96	112
Valley Stream School District NY	Howell Road Elementary School	80	1	Hallway 2 To 17	K-LED	NR	4	4	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.02	0.02	-	140	140	-
Valley Stream School District NY	Howell Road Elementary School	81	1	Hallway 2 To 17	2222T8	LT22	1	1	0.0340	0.0160	2x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	20	120	TRUE	12	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Howell Road Elementary School	82	1	Cafeteria 46	1424T8-28	LT24	8	8	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	25	120	TRUE	26	3,139	0.34	0.17	0.18	1,080	527	552
Valley Stream School District NY	Howell Road Elementary School	83	1	Cafeteria 46	K-LED	NR	3	3	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.01	0.01	-	105	105	-
Valley Stream School District NY	Howell Road Elementary School	84	1	Kitchen 47	1424T8-28	LT24	12	12	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	35	120	TRUE	26	3,139	0.52	0.25	0.26	1,620	791	829
Valley Stream School District NY	Howell Road Elementary School	85	1	Storage 48	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	7	851	0.04	0.02	0.02	37	18	19
Valley Stream School District NY	Howell Road Elementary School	86	1	Storage 49	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	7	851	0.04	0.02	0.02	37	18	19
Valley Stream School District NY	Howell Road Elementary School	87	1	Storage 50	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	7	851	0.04	0.02	0.02	37	18	19
Valley Stream School District NY	Howell Road Elementary School	88	1	Garage 51	1424T8-28	LT24	2	2	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	7	851	0.09	0.04	0.04	73	36	37
Valley Stream School District NY	Howell Road Elementary School	89	1	Bathroom, Women's 52	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	25	120	TRUE	125	1,752	0.04	0.02	0.02	75	37	39
Valley Stream School District NY	Howell Road Elementary School	90	1	Bathroom, Men's 53	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	25	120	TRUE	25	2,054	0.04	0.02	0.02	88	43	45
Valley Stream School District NY	Howell Road Elementary School	91	1	Hallway Main Office To K3	2424T8-28	LT24	16	16	0.0430	0.0210	2x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	20	120	TRUE	12	4,001	0.69	0.34	0.35	2,753	1,344	1,408
Valley Stream School District NY	Howell Road Elementary School	92	1	Hallway Main Office To K3 Display	1313T8	LT13	2	2	0.0260	0.0120	1x3, 1-Lamp T8	LED Int. Driver Lamp, (1) 3' Lamp	20	120	TRUE	12	4,001	0.05	0.02	0.03	208	96	112
Valley Stream School District NY	Howell Road Elementary School	93	1	Hallway Main Office To K3	K-LED	NR	3	3	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.01	0.01	-	105	105	-
Valley Stream School District NY	Howell Road Elementary School	94	1	Hallway Main Office To K3	1414T8-28	LT14	2	2	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	12	120	TRUE	12	4,001	0.04	0.02	0.02	176	84	92
Valley Stream School District NY	Howell Road Elementary School	95	1	Storage 31	1424T8-28	LT24	2	2	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	7	851	0.09	0.04	0.04	73	36	37
Valley Stream School District NY	Howell Road Elementary School	96	1	Office Jc 54	1424T8-28	LT24	5	5	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	3	2,639	0.22	0.11	0.11	567	277	290

Exhibit G-5 - CO #1

Valley Stream UFSD 13
Exhibit G-5-1
ECM 1 - LED Lighting Upgrade
Lighting Line by Line

Site Name	Building Name	Index	Floor	Location	Existing Code	Proposed Code	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Existing Foot Candles	Volts	Included in Project	Hour Code	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Valley Stream School District NY	Howell Road Elementary School	97	1	Office Jc Bath 55	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	25	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Howell Road Elementary School	98	1	Storage 56	1424T8-28	LT24	2	2	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	25	120	TRUE	7	851	0.09	0.04	0.04	73	36	37
Valley Stream School District NY	Howell Road Elementary School	99	1	Office 57	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	25	120	TRUE	25	2,054	0.04	0.02	0.02	88	43	45
Valley Stream School District NY	Howell Road Elementary School	100	1	Classroom	1414T8-28	LT14	8	8	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	30	120	TRUE	125	1,752	0.18	0.08	0.09	308	147	161
Valley Stream School District NY	Howell Road Elementary School	101	1	Classroom 58	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	30	120	TRUE	25	2,054	0.03	0.02	0.02	70	33	37
Valley Stream School District NY	Howell Road Elementary School	102	1	Office 59	1424T8-28	LT24	2	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.09	0.02	0.07	151	37	114
Valley Stream School District NY	Howell Road Elementary School	103	1	Office 60	1424T8-28	LT24	2	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.09	0.02	0.07	151	37	114
Valley Stream School District NY	Howell Road Elementary School	104	1	Storage 63	1222T8	LT22	2	2	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	30	120	TRUE	25	2,054	0.07	0.03	0.04	140	66	74
Valley Stream School District NY	Howell Road Elementary School	105	1	Classroom 102	1414T8-28	LT14	15	15	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	36	120	TRUE	125	1,752	0.33	0.16	0.17	578	276	302
Valley Stream School District NY	Howell Road Elementary School	106	1	Classroom 104	1414T8-28	LT14	15	15	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	36	120	TRUE	125	1,752	0.33	0.16	0.17	578	276	302
Valley Stream School District NY	Howell Road Elementary School	107	1	Classroom 106	1414T8-28	LT14	18	18	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	36	120	TRUE	125	1,752	0.40	0.19	0.21	694	331	363
Valley Stream School District NY	Howell Road Elementary School	108	1	Bathroom, Men's 106a	1414T8-28	LT14	3	3	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	25	120	TRUE	115	2,400	0.07	0.03	0.03	158	76	83
Valley Stream School District NY	Howell Road Elementary School	109	1	Classroom 108	1414T8-28	LT14	18	18	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	36	120	TRUE	125	1,752	0.40	0.19	0.21	694	331	363
Valley Stream School District NY	Howell Road Elementary School	110	1	Classroom 110	1414T8-28	LT14	16	16	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	36	120	TRUE	125	1,752	0.35	0.17	0.18	617	294	322
Valley Stream School District NY	Howell Road Elementary School	111	1	Classroom 112	1414T8-28	LT14	18	18	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	36	120	TRUE	125	1,752	0.40	0.19	0.21	694	331	363
Valley Stream School District NY	Howell Road Elementary School	112	1	Classroom 111	1414T8-28	LT14	18	18	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	36	120	TRUE	125	1,752	0.40	0.19	0.21	694	331	363
Valley Stream School District NY	Howell Road Elementary School	113	1	Classroom 109	1414T8-28	LT14	18	18	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	36	120	TRUE	125	1,752	0.40	0.19	0.21	694	331	363
Valley Stream School District NY	Howell Road Elementary School	114	1	Classroom 107	1414T8-28	LT14	18	18	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	36	120	TRUE	125	1,752	0.40	0.19	0.21	694	331	363
Valley Stream School District NY	Howell Road Elementary School	115	1	Storage 65	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	25	120	TRUE	7	851	0.04	0.02	0.02	37	18	19
Valley Stream School District NY	Howell Road Elementary School	116	1	Bathroom, Women's 107a	1414T8-28	LT14	3	3	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	25	120	TRUE	115	2,400	0.07	0.03	0.03	158	76	83
Valley Stream School District NY	Howell Road Elementary School	117	1	Classroom 105	1414T8-28	LT14	18	18	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	36	120	TRUE	125	1,752	0.40	0.19	0.21	694	331	363
Valley Stream School District NY	Howell Road Elementary School	118	1	Classroom 103	1414T8-28	LT14	18	18	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	36	120	TRUE	125	1,752	0.40	0.19	0.21	694	331	363
Valley Stream School District NY	Howell Road Elementary School	119	1	Classroom 101	1414T8-28	LT14	18	18	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	36	120	TRUE	125	1,752	0.40	0.19	0.21	694	331	363
Valley Stream School District NY	Howell Road Elementary School	120	1	Classroom 100	1414T8-28	LT14	10	10	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	36	120	TRUE	125	1,752	0.22	0.11	0.12	385	184	201
Valley Stream School District NY	Howell Road Elementary School	121	1	Bathroom, Men's 100a	1414T8-28	LT14	1	1	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	25	120	TRUE	15	4,001	0.02	0.01	0.01	88	42	46
Valley Stream School District NY	Howell Road Elementary School	122	1	Bathroom, Men's 100a	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	25	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Howell Road Elementary School	123	1	Bathroom, Women's 100b	1414T8-28	LT14	1	1	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	25	120	TRUE	15	4,001	0.02	0.01	0.01	88	42	46
Valley Stream School District NY	Howell Road Elementary School	124	1	Bathroom, Women's 100b	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	25	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Howell Road Elementary School	125	1	Hallway 112 To 63	1414T8-28	LT14	22	22	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	15	120	TRUE	12	4,001	0.48	0.23	0.25	1,936	924	1,012
Valley Stream School District NY	Howell Road Elementary School	126	1	Hallway 112 To 63	K-LED	NR	3	3	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.01	0.01	-	105	105	-
Valley Stream School District NY	Howell Road Elementary School	127	1	Hallway 112 To 63 Display	1414T8-28	LT14	11	11	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	15	120	TRUE	12	4,001	0.24	0.12	0.13	968	462	506
Valley Stream School District NY	Howell Road Elementary School	128	1	Classroom 70	2424T8-28	LT24	12	12	0.0430	0.0210	2x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	60	120	TRUE	125	1,752	0.52	0.25	0.26	904	442	463

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ECM 1 - LED Lighting Upgrade
Lighting Line by Line

Site Name	Building Name	Index	Floor	Location	Existing Code	Proposed Code	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Existing Foot Candles	Volts	Included in Project	Hour Code	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Valley Stream School District NY	Howell Road Elementary School	129	1	Stage 71	1424T8-28	LT24	6	6	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	25	120	TRUE	28	1,080	0.26	0.13	0.13	279	136	143
Valley Stream School District NY	Howell Road Elementary School	130	1	Stage 71	1424T8-28	LT24	12	12	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	25	120	TRUE	28	1,080	0.52	0.25	0.26	557	272	285
Valley Stream School District NY	Howell Road Elementary School	131	1	Stage 71	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.01	0.01	-	70	70	-
Valley Stream School District NY	Howell Road Elementary School	132	1	Office 72	2424T8-28	LT24	2	2	0.0430	0.0210	2x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	25	2,054	0.09	0.04	0.04	177	86	90
Valley Stream School District NY	Howell Road Elementary School	133	1	Gym Right 73	1464T5	LEDHB140 WG	5	5	0.3520	0.1410	1x4, 6-Lamp T5	LED High Bay, 140w, Wire Guard	35	120	TRUE	27	3,496	1.76	0.71	1.06	6,153	2,465	3,688
Valley Stream School District NY	Howell Road Elementary School	134	1	Gym Left 74	1464T5	LEDHB140 WG	5	5	0.3520	0.1410	1x4, 6-Lamp T5	LED High Bay, 140w, Wire Guard	35	120	TRUE	27	3,496	1.76	0.71	1.06	6,153	2,465	3,688
Valley Stream School District NY	Howell Road Elementary School	135	1	Gym 74	K-LED	NR	3	3	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.01	0.01	-	105	105	-
Valley Stream School District NY	Howell Road Elementary School	136	1	Storage 75	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	7	851	0.04	0.02	0.02	37	18	19
Valley Stream School District NY	Howell Road Elementary School	137	1	Copy Room 76	1414T8-28	LT14	2	2	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	35	120	TRUE	12	4,001	0.04	0.02	0.02	176	84	92
Valley Stream School District NY	Howell Road Elementary School	138	1	Storage 77	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	12	120	TRUE	7	851	0.03	0.02	0.02	29	14	15
Valley Stream School District NY	Howell Road Elementary School	139	1	Office 78	1414T8-28	LT14	2	2	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	35	120	TRUE	25	2,054	0.04	0.02	0.02	90	43	47
Valley Stream School District NY	Howell Road Elementary School	140	1	Hallway Stage To Gym	2424T8-28	LT24	5	5	0.0430	0.0210	2x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	20	120	TRUE	12	4,001	0.22	0.11	0.11	860	420	440
Valley Stream School District NY	Howell Road Elementary School	141	1	Main Lobby	2222T8	LT22	10	10	0.0340	0.0160	2x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	20	120	TRUE	12	4,001	0.34	0.16	0.18	1,360	640	720
Valley Stream School District NY	Howell Road Elementary School	142	1	Main Lobby	2222T8	LT22	4	4	0.0340	0.0160	2x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	20	120	TRUE	12	4,001	0.14	0.06	0.07	544	256	288
Valley Stream School District NY	Howell Road Elementary School	143	1	Main Lobby	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.00	0.00	-	35	35	-
Valley Stream School District NY	Howell Road Elementary School	144	B	Mechanical Room B1	1424T8-28	LT24	2	2	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	20	120	TRUE	7	851	0.09	0.04	0.04	73	36	37
Valley Stream School District NY	Howell Road Elementary School	145	B	Crawspace	I60	LALLO	30	30	0.0600	0.0065	Inc 60w	LED Lamp, A-Line, LLO	8	120	TRUE	7	851	1.80	0.20	1.61	1,532	166	1,366
Valley Stream School District NY	Howell Road Elementary School	146	Ext	North Front Entry	CFL26	LEDWPS02 LMPHEM	6	6	0.0260	0.0200	CFL 26w	LED Wallpack, Small Forward Throw, 20w, PH, BB		120	TRUE	10	4,380	0.16	0.12	0.04	683	526	158
Valley Stream School District NY	Howell Road Elementary School	147	Ext	North Front Entry	S70	LEDCAN42	1	1	0.0940	0.0400	HPS 70w	LED 40w Canopy		120	TRUE	10	4,380	0.09	0.04	0.05	412	175	237
Valley Stream School District NY	Howell Road Elementary School	148	Ext	North Front Entry	LED13X2	NR	1	1	0.0260	0.0260	LED (2) 13w	No Retrofit		120	FALSE	10	4,380	0.03	0.03	-	114	114	-
Valley Stream School District NY	Howell Road Elementary School	149	Ext	North Wall	IND120	LEDFL32	3	3	0.1500	0.0300	Induction 120w	LED Flood, 32w		120	TRUE	10	4,380	0.45	0.09	0.36	1,971	394	1,577
Valley Stream School District NY	Howell Road Elementary School	150	Ext	West Entry	LED13X2	NR	1	1	0.0260	0.0260	LED (2) 13w	No Retrofit		120	FALSE	10	4,380	0.03	0.03	-	114	114	-
Valley Stream School District NY	Howell Road Elementary School	151	Ext	West Side Walk Pole	IND150X3	LEDFL32X3	1	1	0.5400	0.0900	(3) Induction 150w	(3) LED Flood, 32w		120	TRUE	10	4,380	0.54	0.09	0.45	2,365	394	1,971
Valley Stream School District NY	Howell Road Elementary School	152	Ext	South Wall	IND120	LEDFL32	2	2	0.1500	0.0300	Induction 120w	LED Flood, 32w		120	TRUE	10	4,380	0.30	0.06	0.24	1,314	263	1,051
Valley Stream School District NY	Howell Road Elementary School	153	Ext	South Canopy	CFL13	LALLO	2	2	0.0130	0.0065	CFL 13w	LED Lamp, A-Line, LLO		120	TRUE	10	4,380	0.03	0.01	0.01	114	57	57
Valley Stream School District NY	Howell Road Elementary School	154	Ext	South Entry's	PL2X26-6	LK6C-14F-120V	4	4	0.0560	0.0140	CF PL (2) 26w	LED Kit, 6 Inch Can, 14w, Fixed Output		120	TRUE	10	4,380	0.22	0.06	0.17	981	245	736
Valley Stream School District NY	Howell Road Elementary School	155	Ext	South Wall	IND150	LEDFL32	1	1	0.1800	0.0300	Induction 150w	LED Flood, 32w		120	TRUE	10	4,380	0.18	0.03	0.15	788	131	657
Valley Stream School District NY	Howell Road Elementary School	156	Ext	West Side Walk Pole	IND150X2	LEDFL32X2	1	1	0.3600	0.0600	(2) Induction 150w	(2) LED Flood, 32w		120	TRUE	10	4,380	0.36	0.06	0.30	1,577	263	1,314
Valley Stream School District NY	Howell Road Elementary School	157	Ext	East Wall	IND100	LEDWP40	2	2	0.1300	0.0400	Induction 100w	LED Wall Pack 40		120	TRUE	10	4,380	0.26	0.08	0.18	1,139	350	788
Valley Stream School District NY	Howell Road Elementary School	158	Ext	East Entry	CFL26	LAHLO	3	3	0.0260	0.0170	CFL 26w	LED Lamp, A-Line, HLO		120	TRUE	10	4,380	0.08	0.05	0.03	342	223	118
Valley Stream School District NY	Howell Road Elementary School	159	Ext	East Wall	IND120	LEDFL32	2	2	0.1500	0.0300	Induction 120w	LED Flood, 32w		120	TRUE	10	4,380	0.30	0.06	0.24	1,314	263	1,051
Valley Stream School District NY	Howell Road Elementary School	160	Ext	East Entry's	I60	LEDWPS02 LMPHEM	3	3	0.0600	0.0200	Inc 60w	LED Wallpack, Small Forward Throw, 20w, PH, BB		120	TRUE	10	4,380	0.18	0.06	0.12	788	263	526

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Valley Stream School District NY	Howell Road Elementary School	161	Ext	East Entry	IND120	LEDFL32	1	1	0.1500	0.0300	Induction 120w	LED Flood, 32w		120	TRUE	10	4,380	0.15	0.03	0.12	657	131	526
Valley Stream School District NY	James Dever Elementary School	1	1	District Office 1	2424T8-28	LT24	2	2	0.0430	0.0210	2x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	45	120	TRUE	103	2,639	0.09	0.04	0.04	227	111	116
Valley Stream School District NY	James Dever Elementary School	2	1	Closet 1.1	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	20	120	TRUE	7	851	0.04	0.02	0.02	37	18	19
Valley Stream School District NY	James Dever Elementary School	3	1	District Office 1	2424T8-28	LT24	4	4	0.0430	0.0210	2x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	68	120	TRUE	103	2,639	0.17	0.08	0.09	454	222	232
Valley Stream School District NY	James Dever Elementary School	4	1	District Conference 3	2424T8-28	LT24	9	9	0.0430	0.0210	2x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	107	120	TRUE	103	2,639	0.39	0.19	0.20	1,021	499	523
Valley Stream School District NY	James Dever Elementary School	5	1	District Conference 3	1414T8-T2-28	LT14	12	12	0.0430	0.0105	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp		120	TRUE	103	2,639	0.52	0.13	0.39	1,362	333	1,029
Valley Stream School District NY	James Dever Elementary School	6	1	District Conference 3	I65	LR30NLO	2	2	0.0650	0.0130	Inc 65w	LED Lamp, R/PAR30, NLO		120	TRUE	98	24	0.13	0.03	0.10	3	1	2
Valley Stream School District NY	James Dever Elementary School	7	1	Auditorium 5	M250	NR	13	13	0.2950	0.2950	MH 250w	No Retrofit	15	120	FALSE	28	1,080	3.84	3.84	-	4,142	4,142	-
Valley Stream School District NY	James Dever Elementary School	8	1	Auditorium-seating 5	1424T8-28	LT24	6	6	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	7	851	0.26	0.13	0.13	220	107	112
Valley Stream School District NY	James Dever Elementary School	9	1	Auditorium-seating 5	1323T8	LT23	1	1	0.0460	0.0240	1x3, 2-Lamp T8	LED Int. Driver Lamps, (2) 3' Lamps		120	TRUE	7	851	0.05	0.02	0.02	39	20	19
Valley Stream School District NY	James Dever Elementary School	10	1	Auditorium-cloud 5	1414T8-T2-28	LT14	46	46	0.0430	0.0105	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	18	120	TRUE	28	1,080	1.98	0.48	1.50	2,136	522	1,615
Valley Stream School District NY	James Dever Elementary School	11	1	Auditorium-cloud 5	K-LED	NR	5	5	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.02	0.02	-	175	175	-
Valley Stream School District NY	James Dever Elementary School	12	1	Stage 6	1844T8-28	LT44	7	7	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps		120	TRUE	28	1,080	0.60	0.29	0.31	650	318	333
Valley Stream School District NY	James Dever Elementary School	13	1	Stage 6	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps		120	TRUE	28	1,080	0.03	0.02	0.02	37	17	19
Valley Stream School District NY	James Dever Elementary School	14	1	Office 7	1844T8-28	LT44	1	1	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	55	120	TRUE	103	2,639	0.09	0.04	0.04	227	111	116
Valley Stream School District NY	James Dever Elementary School	15	1	Office 8	1844T8-28	LT44	1	1	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	55	120	TRUE	103	2,639	0.09	0.04	0.04	227	111	116
Valley Stream School District NY	James Dever Elementary School	16	1	Storage 9	1424T8-28	LT24	2	2	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	12	120	TRUE	7	851	0.09	0.04	0.04	73	36	37
Valley Stream School District NY	James Dever Elementary School	17	1	Exitway 10	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	12	4,001	0.04	0.02	0.02	172	84	88
Valley Stream School District NY	James Dever Elementary School	18	1	Exitway 10	2222T8	LT22	1	1	0.0340	0.0160	2x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	20	120	TRUE	12	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	James Dever Elementary School	19	1	Exitway 10	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.00	0.00	-	35	35	-
Valley Stream School District NY	James Dever Elementary School	20	1	Exitway 11	2222T8	LT22	1	1	0.0340	0.0160	2x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	20	120	TRUE	12	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	James Dever Elementary School	21	1	Lobby L1	2222T8	LT22	2	2	0.0340	0.0160	2x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps		120	TRUE	12	4,001	0.07	0.03	0.04	272	128	144
Valley Stream School District NY	James Dever Elementary School	22	1	Lobby L1	1444T8-28	LT44	2	2	0.0860	0.0420	1x4, 4-Lamp T8, 28w	LED Int. Driver Lamps, (4) 4' Lamps		120	TRUE	12	4,001	0.17	0.08	0.09	688	336	352
Valley Stream School District NY	James Dever Elementary School	23	1	Closet L1.1	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps		120	TRUE	7	851	0.03	0.02	0.02	29	14	15
Valley Stream School District NY	James Dever Elementary School	24	1	Office 12	2424T8-28	LT24	2	2	0.0430	0.0210	2x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	70	120	TRUE	103	2,639	0.09	0.04	0.04	227	111	116
Valley Stream School District NY	James Dever Elementary School	25	1	Bath Men 13	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	26	120	TRUE	115	2,400	0.04	0.02	0.02	103	50	53
Valley Stream School District NY	James Dever Elementary School	26	1	Jc 13.1	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	107	851	0.04	0.02	0.02	37	18	19
Valley Stream School District NY	James Dever Elementary School	27	1	Bath Women 14	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	26	120	TRUE	115	2,400	0.04	0.02	0.02	103	50	53
Valley Stream School District NY	James Dever Elementary School	28	1	Business Office 15	1844T8-28	LT44	9	9	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	70	120	TRUE	3	2,639	0.77	0.38	0.40	2,043	998	1,045
Valley Stream School District NY	James Dever Elementary School	29	1	Business Office 15	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	3	2,639	0.04	0.02	0.02	113	55	58
Valley Stream School District NY	James Dever Elementary School	30	1	Business Office 15	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.00	0.00	-	35	35	-
Valley Stream School District NY	James Dever Elementary School	31	1	Business Office 16	1824T8-28	LT24	4	4	0.0430	0.0210	1x8, 2-Lamp T8 4', 28w	LED Int. Driver Lamps, (2) 4' Lamps	32	120	TRUE	3	2,639	0.17	0.08	0.09	454	222	232

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Site Name	Building Name	Index	Floor	Location	Existing Code	Proposed Code	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Existing Foot Candles	Volts	Included in Project	Hour Code	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Valley Stream School District NY	James Dever Elementary School	32	1	Business Office 16	1414T8-28	LT14	2	2	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp		120	TRUE	3	2,639	0.04	0.02	0.02	116	55	61
Valley Stream School District NY	James Dever Elementary School	33	1	Business Office 17	1824T8-28	LT24	1	1	0.0430	0.0210	1x8, 2-Lamp T8 4', 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	3	2,639	0.04	0.02	0.02	113	55	58
Valley Stream School District NY	James Dever Elementary School	34	1	Business Office 17	CFL13	LALLO	3	3	0.0130	0.0065	CFL 13w	LED Lamp, A-Line, LLO		120	TRUE	3	2,639	0.04	0.02	0.02	103	51	51
Valley Stream School District NY	James Dever Elementary School	35	2	Projection Booth 2	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	12	120	TRUE	7	851	0.04	0.02	0.02	37	18	19
Valley Stream School District NY	James Dever Elementary School	36	2	Projection Booth 2	1212T8	LT12	2	2	0.0200	0.0080	1x2, 1-Lamp T8	LED Int. Driver Lamp, (1) 2' Lamp		120	TRUE	7	851	0.04	0.02	0.02	34	14	20
Valley Stream School District NY	James Dever Elementary School	37	2	Projection Booth 2	1222T8	LT22	2	2	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps		120	TRUE	7	851	0.07	0.03	0.04	58	27	31
Valley Stream School District NY	James Dever Elementary School	38	1	Kitchen 19	1424T8-28	LT24	8	8	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	26	3,139	0.34	0.17	0.18	1,080	527	552
Valley Stream School District NY	James Dever Elementary School	39	1	Kitchen 19	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps		120	TRUE	26	3,139	0.03	0.02	0.02	107	50	57
Valley Stream School District NY	James Dever Elementary School	40	1	Office 19.1	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	32	120	TRUE	3	2,639	0.04	0.02	0.02	113	55	58
Valley Stream School District NY	James Dever Elementary School	41	1	Storage 20	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	20	120	TRUE	7	851	0.03	0.02	0.02	29	14	15
Valley Stream School District NY	James Dever Elementary School	42	1	Old Locker Room	1844T8-28	LT44	1	1	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	20	120	TRUE	7	851	0.09	0.04	0.04	73	36	37
Valley Stream School District NY	James Dever Elementary School	43	1	Old Locker Room	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	7	851	0.04	0.02	0.02	37	18	19
Valley Stream School District NY	James Dever Elementary School	44	1	Old Locker Room	1222T8	LT22	2	2	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps		120	TRUE	7	851	0.07	0.03	0.04	58	27	31
Valley Stream School District NY	James Dever Elementary School	45	1	Bath Room 21.1	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps		120	TRUE	5	1,040	0.03	0.02	0.02	35	17	19
Valley Stream School District NY	James Dever Elementary School	46	1	Storage	1424T8-28	LT24	2	2	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	7	851	0.09	0.04	0.04	73	36	37
Valley Stream School District NY	James Dever Elementary School	47	1	Gym 23	1444T5	LEDHB140 WG	12	12	0.1025	0.1410	1x4, 4-Lamp T5	LED High Bay, 140w, Wire Guard	30	120	TRUE	27	3,496	1.23	1.69	(0.46)	4,300	5,915	(1,615)
Valley Stream School District NY	James Dever Elementary School	48	1	Gym 23	K-LED	NR	3	3	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.01	0.01	-	105	105	-
Valley Stream School District NY	James Dever Elementary School	49	1	Storage 23.1	CFL26	LALLO	1	1	0.0260	0.0065	CFL 26w	LED Lamp, A-Line, LLO		120	TRUE	7	851	0.03	0.01	0.02	22	6	17
Valley Stream School District NY	James Dever Elementary School	50	1	Office 24	1844T8-28	LT44	1	1	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	64	120	TRUE	103	2,639	0.09	0.04	0.04	227	111	116
Valley Stream School District NY	James Dever Elementary School	51	1	Bath 24.1	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	20	120	TRUE	5	1,040	0.03	0.02	0.02	35	17	19
Valley Stream School District NY	James Dever Elementary School	52	1	Old Locker Room 25	1414T8-28	LT14	1	1	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	8	120	TRUE	107	851	0.02	0.01	0.01	19	9	10
Valley Stream School District NY	James Dever Elementary School	53	1	Old Locker Room 25	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	16	120	TRUE	107	851	0.04	0.02	0.02	37	18	19
Valley Stream School District NY	James Dever Elementary School	54	1	Old Locker Room 25	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps		120	TRUE	107	851	0.03	0.02	0.02	29	14	15
Valley Stream School District NY	James Dever Elementary School	55	1	Storage 26	1414T8-28	LT14	1	1	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	18	120	TRUE	7	851	0.02	0.01	0.01	19	9	10
Valley Stream School District NY	James Dever Elementary School	56	1	Copy Room 27	1844T8-28	LT44	1	1	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps		120	TRUE	103	2,639	0.09	0.04	0.04	227	111	116
Valley Stream School District NY	James Dever Elementary School	57	1	Cafeteria 28	1424T8-28	LT24	18	18	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	17	120	TRUE	26	3,139	0.77	0.38	0.40	2,430	1,187	1,243
Valley Stream School District NY	James Dever Elementary School	58	1	Cafeteria 28	K-LED	NR	3	3	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.01	0.01	-	105	105	-
Valley Stream School District NY	James Dever Elementary School	59	1	Storage 29	1424T8-28	LT24	2	2	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	7	851	0.09	0.04	0.04	73	36	37
Valley Stream School District NY	James Dever Elementary School	60	1	Storage 30	1424T8-28	LT24L14	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps, Lens		120	TRUE	7	851	0.04	0.02	0.02	37	18	19
Valley Stream School District NY	James Dever Elementary School	61	1	Faculty Dinng 30	1824T8-28	LT24	6	6	0.0430	0.0210	1x8, 2-Lamp T8 4', 28w	LED Int. Driver Lamps, (2) 4' Lamps	38	120	TRUE	108	4,001	0.26	0.13	0.13	1,032	504	528
Valley Stream School District NY	James Dever Elementary School	62	1	Main Office 31	1844T8-28	LT44	1	1	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	44	120	TRUE	3	2,639	0.09	0.04	0.04	227	111	116
Valley Stream School District NY	James Dever Elementary School	63	1	Main Office 31	1424T8-28	LT24	3	3	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	3	2,639	0.13	0.06	0.07	340	166	174

Exhibit G-5 - CO #1

Valley Stream UFSD 13
Exhibit G-5-1
ECM 1 - LED Lighting Upgrade
Lighting Line by Line

Site Name	Building Name	Index	Floor	Location	Existing Code	Proposed Code	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Existing Foot Candles	Volts	Included in Project	Hour Code	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Valley Stream School District NY	James Dever Elementary School	64	1	Storage 31.1	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps		120	TRUE	7	851	0.03	0.02	0.02	29	14	15
Valley Stream School District NY	James Dever Elementary School	65	1	Storage 31.2	1212T8	LT12	1	1	0.0200	0.0080	1x2, 1-Lamp T8	LED Int. Driver Lamp, (1) 2' Lamp		120	TRUE	7	851	0.02	0.01	0.01	17	7	10
Valley Stream School District NY	James Dever Elementary School	66	1	Principal Office 32	1844T8-28	LT44	1	1	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	40	120	TRUE	103	2,639	0.09	0.04	0.04	227	111	116
Valley Stream School District NY	James Dever Elementary School	67	1	Conference 33	1844T8-28	LT44	1	1	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	37	120	TRUE	16	2,200	0.09	0.04	0.04	189	92	97
Valley Stream School District NY	James Dever Elementary School	68	1	Nurse 34	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	26	120	TRUE	103	2,639	0.04	0.02	0.02	113	55	58
Valley Stream School District NY	James Dever Elementary School	69	1	Nurse 35	1424T8-28	LT24	5	5	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	3	2,639	0.22	0.11	0.11	567	277	290
Valley Stream School District NY	James Dever Elementary School	70	1	Bath 35.1	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	35	120	TRUE	15	4,001	0.04	0.02	0.02	172	84	88
Valley Stream School District NY	James Dever Elementary School	71	1	Classroom 101	1844T8-28	LT44	6	6	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	40	120	TRUE	103	2,639	0.52	0.25	0.26	1,362	665	697
Valley Stream School District NY	James Dever Elementary School	72	1	Classroom 101	1424T8-28	LT24	2	2	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	103	2,639	0.09	0.04	0.04	227	111	116
Valley Stream School District NY	James Dever Elementary School	73	1	Classroom 101	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	7	851	0.04	0.02	0.02	37	18	19
Valley Stream School District NY	James Dever Elementary School	74	1	Bath 101.1	1414T8-28	LT14	1	1	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	30	120	TRUE	5	1,040	0.02	0.01	0.01	23	11	12
Valley Stream School District NY	James Dever Elementary School	75	1	Closet 101.2	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps		120	TRUE	7	851	0.03	0.02	0.02	29	14	15
Valley Stream School District NY	James Dever Elementary School	76	1	Classroom 102	1844T8-28	LT44	6	6	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	40	120	TRUE	103	2,639	0.52	0.25	0.26	1,362	665	697
Valley Stream School District NY	James Dever Elementary School	77	1	Classroom 102	1424T8-28	LT24	2	2	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	103	2,639	0.09	0.04	0.04	227	111	116
Valley Stream School District NY	James Dever Elementary School	78	1	Bath 102.1	1414T8-28	LT14	1	1	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp		120	TRUE	15	4,001	0.02	0.01	0.01	88	42	46
Valley Stream School District NY	James Dever Elementary School	79	1	Closet 102.2	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps		120	TRUE	7	851	0.03	0.02	0.02	29	14	15
Valley Stream School District NY	James Dever Elementary School	80	1	Closet 102.3	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	7	851	0.04	0.02	0.02	37	18	19
Valley Stream School District NY	James Dever Elementary School	81	1	Custodia Office 36	1414T8-28	LT14	3	3	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	22	120	TRUE	4	4,160	0.07	0.03	0.03	275	131	144
Valley Stream School District NY	James Dever Elementary School	82	1	Bath 36.1	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	20	120	TRUE	5	1,040	0.04	0.02	0.02	45	22	23
Valley Stream School District NY	James Dever Elementary School	83	1	Tool Room 36.2	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps		120	TRUE	7	851	0.03	0.02	0.02	29	14	15
Valley Stream School District NY	James Dever Elementary School	84	1	Boiler Room 37	1424T8-28	LT24	6	6	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	10	120	TRUE	7	851	0.26	0.13	0.13	220	107	112
Valley Stream School District NY	James Dever Elementary School	85	1	Bath Boys 38	1424T8-28	LT24	2	2	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	23	120	TRUE	115	2,400	0.09	0.04	0.04	206	101	106
Valley Stream School District NY	James Dever Elementary School	86	1	Bath Boys 38	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps		120	TRUE	115	2,400	0.03	0.02	0.02	82	38	43
Valley Stream School District NY	James Dever Elementary School	87	1	Jc 39	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	33	120	TRUE	7	851	0.04	0.02	0.02	37	18	19
Valley Stream School District NY	James Dever Elementary School	88	1	Bath Girls 40	1424T8-28	LT24	2	2	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	115	2,400	0.09	0.04	0.04	206	101	106
Valley Stream School District NY	James Dever Elementary School	89	1	Bath Girls 40	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps		120	TRUE	115	2,400	0.03	0.02	0.02	82	38	43
Valley Stream School District NY	James Dever Elementary School	90	1	Classroom 104	1844T8-28	LT44	8	8	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	48	120	TRUE	125	1,752	0.69	0.34	0.35	1,205	589	617
Valley Stream School District NY	James Dever Elementary School	91	1	Classroom 106	1844T8-28	LT44	8	8	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	45	120	TRUE	125	1,752	0.69	0.34	0.35	1,205	589	617
Valley Stream School District NY	James Dever Elementary School	92	1	Classroom 108	1844T8-28	LT44	8	8	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	45	120	TRUE	125	1,752	0.69	0.34	0.35	1,205	589	617
Valley Stream School District NY	James Dever Elementary School	93	1	Classroom 110	1844T8-28	LT44	8	8	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	45	120	TRUE	125	1,752	0.69	0.34	0.35	1,205	589	617
Valley Stream School District NY	James Dever Elementary School	94	1	Classroom 112	1844T8-28	LT44	7	7	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	45	120	TRUE	125	1,752	0.60	0.29	0.31	1,055	515	540
Valley Stream School District NY	James Dever Elementary School	95	1	Classroom 112	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	25	2,054	0.04	0.02	0.02	88	43	45

Exhibit G-5 - CO #1

Valley Stream UFSD 13
Exhibit G-5-1
ECM 1 - LED Lighting Upgrade
Lighting Line by Line

Site Name	Building Name	Index	Floor	Location	Existing Code	Proposed Code	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Existing Foot Candles	Volts	Included in Project	Hour Code	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Valley Stream School District NY	James Dever Elementary School	96	1	Library 41	223UT8	LT32R22	3	3	0.0850	0.0240	2x2, 3-Lamp U T8	LED Int. Driver Lamps, (3) 2' Lamps, 2x2 Refl		120	TRUE	25	2,054	0.26	0.07	0.18	524	148	376
Valley Stream School District NY	James Dever Elementary School	97	1	Library 41	PL2X26-6	LK6C-14F-120V	4	4	0.0560	0.0140	CF PL (2) 26w	LED Kit, 6 Inch Can, 14w, Fixed Output		120	TRUE	25	2,054	0.22	0.06	0.17	460	115	345
Valley Stream School District NY	James Dever Elementary School	98	1	Library 41	PL2X26-6	LK6C-14F-120V	2	2	0.0560	0.0140	CF PL (2) 26w	LED Kit, 6 Inch Can, 14w, Fixed Output		120	TRUE	25	2,054	0.11	0.03	0.08	230	58	173
Valley Stream School District NY	James Dever Elementary School	99	1	Library 41	PL2X26-6	LK6C-14F-120V	3	3	0.0560	0.0140	CF PL (2) 26w	LED Kit, 6 Inch Can, 14w, Fixed Output		120	TRUE	25	2,054	0.17	0.04	0.13	345	86	259
Valley Stream School District NY	James Dever Elementary School	100	1	Library 41	K-LED	NR	3	3	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.01	0.01	-	105	105	-
Valley Stream School District NY	James Dever Elementary School	101	1	Library 41	223UT8	LT32R22	7	7	0.0850	0.0240	2x2, 3-Lamp U T8	LED Int. Driver Lamps, (3) 2' Lamps, 2x2 Refl	60	120	TRUE	25	2,054	0.60	0.17	0.43	1,222	345	877
Valley Stream School District NY	James Dever Elementary School	102	1	Library 41	223UT8BB	LT32R22MI	2	2	0.0850	0.0240	2x2, 3-Lamp U T8, BB	LED Int. Driver Lamps, (3) 2' Lamps, 2x2 Refl, MI		120	TRUE	25	2,054	0.17	0.05	0.12	349	99	251
Valley Stream School District NY	James Dever Elementary School	103	1	Library 41	223UT8	LT32R22	9	9	0.0850	0.0240	2x2, 3-Lamp U T8	LED Int. Driver Lamps, (3) 2' Lamps, 2x2 Refl	63	120	TRUE	25	2,054	0.77	0.22	0.55	1,571	444	1,128
Valley Stream School District NY	James Dever Elementary School	104	1	Library 41	1864T8-28	LT64	6	6	0.1290	0.0630	1x8, 6-Lamp T8, 28w	LED Int. Driver Lamps, (6) 4' Lamps	61	120	TRUE	25	2,054	0.77	0.38	0.40	1,590	776	813
Valley Stream School District NY	James Dever Elementary School	105	1	Library 41	PL2X26-6	LK6C-14F-120V	6	6	0.0560	0.0140	CF PL (2) 26w	LED Kit, 6 Inch Can, 14w, Fixed Output		120	TRUE	25	2,054	0.34	0.08	0.25	690	173	518
Valley Stream School District NY	James Dever Elementary School	106	1	Bath 41.1	223UT8	LT32R22	1	1	0.0850	0.0240	2x2, 3-Lamp U T8	LED Int. Driver Lamps, (3) 2' Lamps, 2x2 Refl	24	120	TRUE	5	1,040	0.09	0.02	0.06	88	25	63
Valley Stream School District NY	James Dever Elementary School	107	1	Office 41.2	2424T8-28	LT24	1	1	0.0430	0.0210	2x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	3	2,639	0.04	0.02	0.02	113	55	58
Valley Stream School District NY	James Dever Elementary School	108	1	Storage 41.3	CFL13X2	LALLOX2	1	1	0.0260	0.0130	CFL (2) 13w	LED Lamp, A-Line, LLO, x2		120	TRUE	7	851	0.03	0.01	0.01	22	11	11
Valley Stream School District NY	James Dever Elementary School	109	1	Classroom 111	1844T8-28	LT44	8	8	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	48	120	TRUE	125	1,752	0.69	0.34	0.35	1,205	589	617
Valley Stream School District NY	James Dever Elementary School	110	1	Classroom 109	1844T8-28	LT44	8	8	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	48	120	TRUE	125	1,752	0.69	0.34	0.35	1,205	589	617
Valley Stream School District NY	James Dever Elementary School	111	1	Bath Boys 42	1424T8-28	LT24	2	2	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	23	120	TRUE	115	2,400	0.09	0.04	0.04	206	101	106
Valley Stream School District NY	James Dever Elementary School	112	1	Jc 44	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	23	120	TRUE	7	851	0.04	0.02	0.02	37	18	19
Valley Stream School District NY	James Dever Elementary School	113	1	Bath Girls 43	1424T8-28	LT24	2	2	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	23	120	TRUE	115	2,400	0.09	0.04	0.04	206	101	106
Valley Stream School District NY	James Dever Elementary School	114	1	Classroom 107a	1844T8-28	LT44	2	2	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	40	120	TRUE	25	2,054	0.17	0.08	0.09	353	173	181
Valley Stream School District NY	James Dever Elementary School	115	1	Classroom 107	1844T8-28	LT44	8	8	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	50	120	TRUE	125	1,752	0.69	0.34	0.35	1,205	589	617
Valley Stream School District NY	James Dever Elementary School	116	1	Classroom 105	1844T8-28	LT44	8	8	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	50	120	TRUE	125	1,752	0.69	0.34	0.35	1,205	589	617
Valley Stream School District NY	James Dever Elementary School	117	1	Classroom 103	1844T8-28	LT44	6	6	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	50	120	TRUE	125	1,752	0.52	0.25	0.26	904	442	463
Valley Stream School District NY	James Dever Elementary School	118	1	Classroom 103	1424T8-28	LT24	2	2	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	50	120	TRUE	125	1,752	0.09	0.04	0.04	151	74	77
Valley Stream School District NY	James Dever Elementary School	119	1	Office 114b	1824T8-28	LT24	4	4	0.0430	0.0210	1x8, 2-Lamp T8 4', 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	103	2,639	0.17	0.08	0.09	454	222	232
Valley Stream School District NY	James Dever Elementary School	120	1	Office 114a	1824T8-28	LT24	4	4	0.0430	0.0210	1x8, 2-Lamp T8 4', 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	103	2,639	0.17	0.08	0.09	454	222	232
Valley Stream School District NY	James Dever Elementary School	121	1	Classroom 114	1824T8-28	LT24	8	8	0.0430	0.0210	1x8, 2-Lamp T8 4', 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.34	0.17	0.18	603	294	308
Valley Stream School District NY	James Dever Elementary School	122	1	Classroom 114	1414T8-28	LT14	4	4	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp		120	TRUE	125	1,752	0.09	0.04	0.05	154	74	81
Valley Stream School District NY	James Dever Elementary School	123	1	Bath 114.1	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	22	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	James Dever Elementary School	124	1	Storage 114.2	1844T8-28	LT44	1	1	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	64	120	TRUE	7	851	0.09	0.04	0.04	73	36	37
Valley Stream School District NY	James Dever Elementary School	125	1	Classroom 116	1824T8-28	LT24	8	8	0.0430	0.0210	1x8, 2-Lamp T8 4', 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.34	0.17	0.18	603	294	308
Valley Stream School District NY	James Dever Elementary School	126	1	Classroom 116	1414T8-28	LT14	4	4	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp		120	TRUE	125	1,752	0.09	0.04	0.05	154	74	81
Valley Stream School District NY	James Dever Elementary School	127	1	Kiln 116.1	1414T8-28	LT14	1	1	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp		120	TRUE	7	851	0.02	0.01	0.01	19	9	10

Exhibit G-5 - CO #1

Valley Stream UFSD 13
Exhibit G-5-1
ECM 1 - LED Lighting Upgrade
Lighting Line by Line

Site Name	Building Name	Index	Floor	Location	Existing Code	Proposed Code	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Existing Foot Candles	Volts	Included in Project	Hour Code	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Valley Stream School District NY	James Dever Elementary School	128	1	Storage 116.2	1844T8-28	LT44	1	1	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	64	120	TRUE	7	851	0.09	0.04	0.04	73	36	37
Valley Stream School District NY	James Dever Elementary School	129	1	Classroom 118	1824T8-28	LT24	9	9	0.0430	0.0210	1x8, 2-Lamp T8 4', 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.39	0.19	0.20	678	331	347
Valley Stream School District NY	James Dever Elementary School	130	1	Bath 118.1	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	20	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	James Dever Elementary School	131	1	Classroom 119	1824T8-28	LT24	10	10	0.0430	0.0210	1x8, 2-Lamp T8 4', 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.43	0.21	0.22	753	368	385
Valley Stream School District NY	James Dever Elementary School	132	1	Classroom 119	1414T8-28	LT14	1	1	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp		120	TRUE	125	1,752	0.02	0.01	0.01	39	18	20
Valley Stream School District NY	James Dever Elementary School	133	1	Storage 119.1	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	20	120	TRUE	7	851	0.03	0.02	0.02	29	14	15
Valley Stream School District NY	James Dever Elementary School	134	1	Bath 119.2	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	20	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	James Dever Elementary School	135	1	Classroom 117	1824T8-28	LT24	10	10	0.0430	0.0210	1x8, 2-Lamp T8 4', 28w	LED Int. Driver Lamps, (2) 4' Lamps	36	120	TRUE	125	1,752	0.43	0.21	0.22	753	368	385
Valley Stream School District NY	James Dever Elementary School	136	1	Classroom 117	1414T8-28	LT14	1	1	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp		120	TRUE	125	1,752	0.02	0.01	0.01	39	18	20
Valley Stream School District NY	James Dever Elementary School	137	1	Storage 117.1	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	20	120	TRUE	7	851	0.03	0.02	0.02	29	14	15
Valley Stream School District NY	James Dever Elementary School	138	1	Bath 117.2	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	20	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	James Dever Elementary School	139	1	Classroom 115	1824T8-28	LT24	10	10	0.0430	0.0210	1x8, 2-Lamp T8 4', 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.43	0.21	0.22	753	368	385
Valley Stream School District NY	James Dever Elementary School	140	1	Classroom 115	1414T8-28	LT14	1	1	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp		120	TRUE	125	1,752	0.02	0.01	0.01	39	18	20
Valley Stream School District NY	James Dever Elementary School	141	1	Storage 115.1	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	20	120	TRUE	7	851	0.03	0.02	0.02	29	14	15
Valley Stream School District NY	James Dever Elementary School	142	1	Bath 115.2	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	20	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	James Dever Elementary School	143	1	Classroom 113	1824T8-28	LT24	10	10	0.0430	0.0210	1x8, 2-Lamp T8 4', 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.43	0.21	0.22	753	368	385
Valley Stream School District NY	James Dever Elementary School	144	1	Classroom 113	1414T8-28	LT14	1	1	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp		120	TRUE	125	1,752	0.02	0.01	0.01	39	18	20
Valley Stream School District NY	James Dever Elementary School	145	1	Storage 113.1	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	20	120	TRUE	7	851	0.03	0.02	0.02	29	14	15
Valley Stream School District NY	James Dever Elementary School	146	1	Bath 113.2	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	20	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	James Dever Elementary School	147	1	Classroom 123a	2424T8-28	LT24	5	5	0.0430	0.0210	2x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.22	0.11	0.11	377	184	193
Valley Stream School District NY	James Dever Elementary School	148	1	Classroom 123a	2222T8	LT22	1	1	0.0340	0.0160	2x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps		120	TRUE	125	1,752	0.03	0.02	0.02	60	28	32
Valley Stream School District NY	James Dever Elementary School	149	1	Bath 114b	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	15	4,001	0.04	0.02	0.02	172	84	88
Valley Stream School District NY	James Dever Elementary School	150	1	Hall H1	2424T8-28	LT24	11	11	0.0430	0.0210	2x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	30	120	TRUE	12	4,001	0.47	0.23	0.24	1,892	924	968
Valley Stream School District NY	James Dever Elementary School	151	1	Hall H1	1414T8-28	LT14	9	9	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp		120	TRUE	12	4,001	0.20	0.09	0.10	792	378	414
Valley Stream School District NY	James Dever Elementary School	152	1	Hall H1	K-LED	NR	4	4	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.02	0.02	-	140	140	-
Valley Stream School District NY	James Dever Elementary School	153	1	Hall H1	1414T8BB-28	LT14MI	1	1	0.0220	0.0105	1x4, 1-Lamp T8, BB, 28w	LED Int. Driver Lamp, (1) 4' Lamp, MI		120	TRUE	12	4,001	0.02	0.01	0.01	88	42	46
Valley Stream School District NY	James Dever Elementary School	154	1	Hall H1	1844T8-28	LT44	2	2	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	32	120	TRUE	12	4,001	0.17	0.08	0.09	688	336	352
Valley Stream School District NY	James Dever Elementary School	155	1	Hall H1	223UT8	LT32R22	8	8	0.0850	0.0240	2x2, 3-Lamp U T8	LED Int. Driver Lamps, (3) 2' Lamps, 2x2 Refl	60	120	TRUE	12	4,001	0.68	0.19	0.49	2,721	768	1,952
Valley Stream School District NY	James Dever Elementary School	156	1	Hall H1	PL2X26-6	LK6C-14F-120V	1	1	0.0560	0.0140	CF PL (2) 26w	LED Kit, 6 Inch Can, 14w, Fixed Output		120	TRUE	12	4,001	0.06	0.01	0.04	224	56	168
Valley Stream School District NY	James Dever Elementary School	157	1	Hall H2	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	12	4,001	0.04	0.02	0.02	172	84	88
Valley Stream School District NY	James Dever Elementary School	158	1	Hall H2	2424T8-28	LT24	20	20	0.0430	0.0210	2x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	25	120	TRUE	12	4,001	0.86	0.42	0.44	3,441	1,680	1,760
Valley Stream School District NY	James Dever Elementary School	159	1	Hall H2	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.01	0.01	-	70	70	-

Exhibit G-5 - CO #1

Valley Stream UFSD 13
Exhibit G-5-1
ECM 1 - LED Lighting Upgrade
Lighting Line by Line

Site Name	Building Name	Index	Floor	Location	Existing Code	Proposed Code	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Existing Foot Candles	Volts	Included in Project	Hour Code	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Valley Stream School District NY	James Dever Elementary School	160	1	Hall H2	1844T8-28	LT44	1	1	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	43	120	TRUE	12	4,001	0.09	0.04	0.04	344	168	176
Valley Stream School District NY	James Dever Elementary School	161	1	Hall H2	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	12	4,001	0.04	0.02	0.02	172	84	88
Valley Stream School District NY	James Dever Elementary School	162	1	Hall H3	2424T8-28	LT24	14	14	0.0430	0.0210	2x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	30	120	TRUE	12	4,001	0.60	0.29	0.31	2,409	1,176	1,232
Valley Stream School District NY	James Dever Elementary School	163	1	Hall H3	K-LED	NR	3	3	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.01	0.01	-	105	105	-
Valley Stream School District NY	James Dever Elementary School	164	1	Hall H3	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	12	4,001	0.04	0.02	0.02	172	84	88
Valley Stream School District NY	James Dever Elementary School	165	1	Lobby L2	1844T8-28	LT44	4	4	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	35	120	TRUE	12	4,001	0.34	0.17	0.18	1,376	672	704
Valley Stream School District NY	James Dever Elementary School	166	1	Lobby L2	I60	LR30NLO	1	1	0.0600	0.0130	Inc 60w	LED Lamp, R/PAR30, NLO		120	TRUE	12	4,001	0.06	0.01	0.05	240	52	188
Valley Stream School District NY	James Dever Elementary School	167	1	Lobby L2	1824T8-28	LT24	2	2	0.0430	0.0210	1x8, 2-Lamp T8 4', 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	12	4,001	0.09	0.04	0.04	344	168	176
Valley Stream School District NY	James Dever Elementary School	168	1	Lobby L2	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.00	0.00	-	35	35	-
Valley Stream School District NY	James Dever Elementary School	169	2	Classroom 200	1844T8-28	LT44	9	9	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	65	120	TRUE	25	2,054	0.77	0.38	0.40	1,590	776	813
Valley Stream School District NY	James Dever Elementary School	170	2	Server Room 200a	1844T8-28	LT44	1	1	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps		120	TRUE	7	851	0.09	0.04	0.04	73	36	37
Valley Stream School District NY	James Dever Elementary School	171	2	Bath 200b	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	19	120	TRUE	15	4,001	0.04	0.02	0.02	172	84	88
Valley Stream School District NY	James Dever Elementary School	172	2	Office 200c	1424T8-28	LT24	4	4	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	30	120	TRUE	3	2,639	0.17	0.08	0.09	454	222	232
Valley Stream School District NY	James Dever Elementary School	173	2	Bath 200d	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	27	120	TRUE	15	4,001	0.04	0.02	0.02	172	84	88
Valley Stream School District NY	James Dever Elementary School	174	2	Hall To 200c	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	25	120	TRUE	12	4,001	0.04	0.02	0.02	172	84	88
Valley Stream School District NY	James Dever Elementary School	175	2	Storage 45	1424T8-28	LT24	2	2	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	22	120	TRUE	7	851	0.09	0.04	0.04	73	36	37
Valley Stream School District NY	James Dever Elementary School	176	2	Storage 45	1424T8-28	LT24L14	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps, Lens		120	TRUE	7	851	0.04	0.02	0.02	37	18	19
Valley Stream School District NY	James Dever Elementary School	177	2	Storage 46	1424T8-28	LT24L14	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps, Lens	15	120	TRUE	7	851	0.04	0.02	0.02	37	18	19
Valley Stream School District NY	James Dever Elementary School	178	2	Bath Boys 47	1424T8-28	LT24	2	2	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	28	120	TRUE	115	2,400	0.09	0.04	0.04	206	101	106
Valley Stream School District NY	James Dever Elementary School	179	2	Jc 48	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	20	120	TRUE	7	851	0.04	0.02	0.02	37	18	19
Valley Stream School District NY	James Dever Elementary School	180	2	Bath Girls 49	1424T8-28	LT24	2	2	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	28	120	TRUE	115	2,400	0.09	0.04	0.04	206	101	106
Valley Stream School District NY	James Dever Elementary School	181	2	Classroom 202	1844T8-28	LT44	8	8	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	40	120	TRUE	125	1,752	0.69	0.34	0.35	1,205	589	617
Valley Stream School District NY	James Dever Elementary School	182	2	Classroom 204	1844T8-28	LT44	8	8	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	40	120	TRUE	125	1,752	0.69	0.34	0.35	1,205	589	617
Valley Stream School District NY	James Dever Elementary School	183	2	Classroom 204	1424T8-28	LT24	2	2	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	125	1,752	0.09	0.04	0.04	151	74	77
Valley Stream School District NY	James Dever Elementary School	184	2	Classroom 206	1844T8-28	LT44	8	8	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	40	120	TRUE	125	1,752	0.69	0.34	0.35	1,205	589	617
Valley Stream School District NY	James Dever Elementary School	185	2	Classroom 208	1844T8-28	LT44	8	8	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	40	120	TRUE	125	1,752	0.69	0.34	0.35	1,205	589	617
Valley Stream School District NY	James Dever Elementary School	186	2	Classroom 210	1844T8-28	LT44	8	8	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	40	120	TRUE	125	1,752	0.69	0.34	0.35	1,205	589	617
Valley Stream School District NY	James Dever Elementary School	187	2	Classroom 209	1844T8-28	LT44	8	8	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	40	120	TRUE	125	1,752	0.69	0.34	0.35	1,205	589	617
Valley Stream School District NY	James Dever Elementary School	188	2	Classroom 207	1844T8-28	LT44	8	8	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	40	120	TRUE	125	1,752	0.69	0.34	0.35	1,205	589	617
Valley Stream School District NY	James Dever Elementary School	189	2	Bath Boys 50	1424T8-28	LT24	2	2	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	18	120	TRUE	115	2,400	0.09	0.04	0.04	206	101	106
Valley Stream School District NY	James Dever Elementary School	190	2	Jc 51	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	20	120	TRUE	7	851	0.04	0.02	0.02	37	18	19
Valley Stream School District NY	James Dever Elementary School	191	2	Bath Girls 52	1424T8-28	LT24	2	2	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	28	120	TRUE	115	2,400	0.09	0.04	0.04	206	101	106

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Valley Stream UFSD 13
Exhibit G-5-1
ECM 1 - LED Lighting Upgrade
Lighting Line by Line

Site Name	Building Name	Index	Floor	Location	Existing Code	Proposed Code	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Existing Foot Candles	Volts	Included in Project	Hour Code	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Valley Stream School District NY	James Dever Elementary School	192	2	Classroom 205a	1844T8-28	LT44	2	2	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	40	120	TRUE	103	2,639	0.17	0.08	0.09	454	222	232
Valley Stream School District NY	James Dever Elementary School	193	2	Classroom 207	1844T8-28	LT44	8	8	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	40	120	TRUE	125	1,752	0.69	0.34	0.35	1,205	589	617
Valley Stream School District NY	James Dever Elementary School	194	2	Classroom 205	1844T8-28	LT44	8	8	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	40	120	TRUE	125	1,752	0.69	0.34	0.35	1,205	589	617
Valley Stream School District NY	James Dever Elementary School	195	2	Classroom 203	1844T8-28	LT44	8	8	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	40	120	TRUE	125	1,752	0.69	0.34	0.35	1,205	589	617
Valley Stream School District NY	James Dever Elementary School	196	2	Classroom 201	1844T8-28	LT44	8	8	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	40	120	TRUE	125	1,752	0.69	0.34	0.35	1,205	589	617
Valley Stream School District NY	James Dever Elementary School	197	2	Classroom 201	1424T8-28	LT24	2	2	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	125	1,752	0.09	0.04	0.04	151	74	77
Valley Stream School District NY	James Dever Elementary School	198	2	Stairs 1	2424T8-28	LT24	2	2	0.0430	0.0210	2x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	19	120	TRUE	12	4,001	0.09	0.04	0.04	344	168	176
Valley Stream School District NY	James Dever Elementary School	199	2	Hall H4	2424T8-28	LT24	18	18	0.0430	0.0210	2x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	25	120	TRUE	12	4,001	0.77	0.38	0.40	3,097	1,512	1,584
Valley Stream School District NY	James Dever Elementary School	200	2	Hall H4	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.01	0.01	-	70	70	-
Valley Stream School District NY	James Dever Elementary School	201	Ext	Wall Packs	LPS55	LEDWP40	2	2	0.0600	0.0400	LPS 55w	LED Wall Pack 40		120	TRUE	10	4,380	0.12	0.08	0.04	526	350	175
Valley Stream School District NY	James Dever Elementary School	202	Ext	Wall Packs	S150	LEDWP40	1	1	0.1880	0.0400	HPS 150w	LED Wall Pack 40		120	TRUE	10	4,380	0.19	0.04	0.15	823	175	648
Valley Stream School District NY	James Dever Elementary School	203	Ext	Exit Door Canopy	I60	LEDWPS02 LMPHEM	1	1	0.0600	0.0200	Inc 60w	LED Wallpack, Small Forward Throw, 20w, PH, BB		120	TRUE	10	4,380	0.06	0.02	0.04	263	88	175
Valley Stream School District NY	James Dever Elementary School	204	Ext	Building Mounted Floods	IND150	LEDFL32	3	3	0.1800	0.0300	Induction 150w	LED Flood, 32w		120	TRUE	10	4,380	0.54	0.09	0.45	2,365	394	1,971
Valley Stream School District NY	James Dever Elementary School	205	Ext	Exit Door Canopy	I60	LEDWPS02 LMPHEM	1	1	0.0600	0.0200	Inc 60w	LED Wallpack, Small Forward Throw, 20w, PH, BB		120	TRUE	10	4,380	0.06	0.02	0.04	263	88	175
Valley Stream School District NY	James Dever Elementary School	206	Ext	Building Mounted Floods	IND150	LEDFL32	1	1	0.1800	0.0300	Induction 150w	LED Flood, 32w		120	TRUE	10	4,380	0.18	0.03	0.15	788	131	657
Valley Stream School District NY	James Dever Elementary School	207	Ext	Wall Packs	LPS55	LEDWP40	1	1	0.0600	0.0400	LPS 55w	LED Wall Pack 40		120	TRUE	10	4,380	0.06	0.04	0.02	263	175	88
Valley Stream School District NY	James Dever Elementary School	208	Ext	Exit Door Canopy	I60	LEDWPS02 LMPHEM	1	1	0.0600	0.0200	Inc 60w	LED Wallpack, Small Forward Throw, 20w, PH, BB		120	TRUE	10	4,380	0.06	0.02	0.04	263	88	175
Valley Stream School District NY	James Dever Elementary School	209	Ext	Playground	IND150X3	LEDFL32X3	1	1	0.5400	0.0900	(3) Induction 150w	(3) LED Flood, 32w		120	TRUE	10	4,380	0.54	0.09	0.45	2,365	394	1,971
Valley Stream School District NY	James Dever Elementary School	210	Ext	Wall Packs	LPS55	LEDWP40	3	3	0.0600	0.0400	LPS 55w	LED Wall Pack 40		120	TRUE	10	4,380	0.18	0.12	0.06	788	526	263
Valley Stream School District NY	James Dever Elementary School	211	Ext	Library Entrance Canopy	PL2X26-6	LK6C-14F-120V	2	2	0.0560	0.0140	CF PL (2) 26w	LED Kit, 6 Inch Can, 14w, Fixed Output		120	TRUE	10	4,380	0.11	0.03	0.08	491	123	368
Valley Stream School District NY	James Dever Elementary School	212	Ext	Wall Lights	M100	NR	2	2	0.1300	0.1300	MH 100w	No Retrofit		120	FALSE	10	4,380	0.26	0.26	-	1,139	1,139	-
Valley Stream School District NY	James Dever Elementary School	213	Ext	Wall Lights By Doors	M100	LEDWPS02 LMPHEM	2	2	0.1300	0.0200	MH 100w	LED Wallpack, Small Forward Throw, 20w, PH, BB		120	TRUE	10	4,380	0.26	0.04	0.22	1,139	175	964
Valley Stream School District NY	James Dever Elementary School	214	Ext	Wall Pack	LPS55	LEDWP40	1	1	0.0600	0.0400	LPS 55w	LED Wall Pack 40		120	TRUE	10	4,380	0.06	0.04	0.02	263	175	88
Valley Stream School District NY	James Dever Elementary School	215	Ext	Building Flood	S150	LEDFL32	1	1	0.1880	0.0300	HPS 150w	LED Flood, 32w		120	TRUE	10	4,380	0.19	0.03	0.16	823	131	692
Valley Stream School District NY	James Dever Elementary School	216	Ext	Wall Pack	LED18	NR	1	1	0.0180	0.0180	LED 18w	No Retrofit		120	FALSE	10	4,380	0.02	0.02	-	79	79	-
Valley Stream School District NY	James Dever Elementary School	217	Ext	Auditorium Entry Doors Canopy	I60	LEDWPS02 LMPHEM	2	2	0.0600	0.0200	Inc 60w	LED Wallpack, Small Forward Throw, 20w, PH, BB		120	TRUE	10	4,380	0.12	0.04	0.08	526	175	350
Valley Stream School District NY	James Dever Elementary School	218	Ext	Auditorium Entry Doors Canopy	I75X2	LR30NLOX2	1	1	0.1500	0.0260	Inc (2) 75w	LED Lamp, R/PAR30, NLO x2		120	TRUE	10	4,380	0.15	0.03	0.12	657	114	543
Valley Stream School District NY	James Dever Elementary School	219	Ext	Auditorium Walk Way	LED18	NR	3	3	0.0180	0.0180	LED 18w	No Retrofit		120	FALSE	10	4,380	0.05	0.05	-	237	237	-
Valley Stream School District NY	James Dever Elementary School	220	Ext	Buidling Floods	S250	LEDFL64	2	2	0.2950	0.0600	HPS 250w	LED 64w Flood		120	TRUE	10	4,380	0.59	0.12	0.47	2,584	526	2,059
Valley Stream School District NY	Wheeler Elementary School	1	B	Custodial Office	1424T8-28	LT24	2	2	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	24	120	TRUE	4	4,160	0.09	0.04	0.04	358	175	183
Valley Stream School District NY	Wheeler Elementary School	2	B	Custodial Office B1	1424T8-28	LT24L14	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps, Lens		120	TRUE	4	4,160	0.04	0.02	0.02	179	87	92
Valley Stream School District NY	Wheeler Elementary School	3	B	Custodial Office B1	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps		120	TRUE	4	4,160	0.03	0.02	0.02	141	67	75

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Site Name	Building Name	Index	Floor	Location	Existing Code	Proposed Code	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Existing Foot Candles	Volts	Included in Project	Hour Code	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Valley Stream School District NY	Wheeler Elementary School	4	B	Bath B2	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	20	120	TRUE	6	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Wheeler Elementary School	5	B	Boiler Room B3	1424T8-28	LT24	5	5	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	16	120	TRUE	7	851	0.22	0.11	0.11	183	89	94
Valley Stream School District NY	Wheeler Elementary School	6	B	Boiler Room B3	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.00	0.00	-	35	35	-
Valley Stream School District NY	Wheeler Elementary School	7	B	Boiler Room B4	1424T8-28	LT24	5	5	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	9	120	TRUE	7	851	0.22	0.11	0.11	183	89	94
Valley Stream School District NY	Wheeler Elementary School	8	B	Boiler Room B4	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.00	0.00	-	35	35	-
Valley Stream School District NY	Wheeler Elementary School	9	B	Pipe Chase B5	I150	LAHLO	1	1	0.1500	0.0170	Inc 150w	LED Lamp, A-Line, HLO		120	TRUE	7	851	0.15	0.02	0.13	128	14	113
Valley Stream School District NY	Wheeler Elementary School	10	B	Pipe Chase B6	CFL26	LR30NLO	1	1	0.0260	0.0130	CFL 26w	LED Lamp, R/PAR30, NLO		120	TRUE	7	851	0.03	0.01	0.01	22	11	11
Valley Stream School District NY	Wheeler Elementary School	11	B	Cafeteria B7	2424T8-28	LT24	25	25	0.0430	0.0210	2x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	30	120	TRUE	26	3,139	1.08	0.53	0.55	3,374	1,648	1,726
Valley Stream School District NY	Wheeler Elementary School	12	B	Cafeteria B7	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.01	0.01	-	70	70	-
Valley Stream School District NY	Wheeler Elementary School	13	B	Bath Boys B8	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	15	4,001	0.04	0.02	0.02	172	84	88
Valley Stream School District NY	Wheeler Elementary School	14	B	Bath Girls B9	1414T8-28	LT14	1	1	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	15	120	TRUE	15	4,001	0.02	0.01	0.01	88	42	46
Valley Stream School District NY	Wheeler Elementary School	15	B	Storage B10	1212T8	LT12	1	1	0.0200	0.0080	1x2, 1-Lamp T8	LED Int. Driver Lamp, (1) 2' Lamp		120	TRUE	7	851	0.02	0.01	0.01	17	7	10
Valley Stream School District NY	Wheeler Elementary School	16	B	Classroom B11	2424T8-28	LT24	12	12	0.0430	0.0210	2x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	50	120	TRUE	25	2,054	0.52	0.25	0.26	1,060	518	542
Valley Stream School District NY	Wheeler Elementary School	17	B	Office Social Worker B12	2424T8-28	LT24	2	2	0.0430	0.0210	2x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	30	120	TRUE	3	2,639	0.09	0.04	0.04	227	111	116
Valley Stream School District NY	Wheeler Elementary School	18	B	Office Social Worker B12	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	3	2,639	0.04	0.02	0.02	113	55	58
Valley Stream School District NY	Wheeler Elementary School	19	B	Kitchen B13	1844T8-28	LT44	10	10	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	70	120	TRUE	26	3,139	0.86	0.42	0.44	2,700	1,318	1,381
Valley Stream School District NY	Wheeler Elementary School	20	B	Kitchen B13	1222T8	LT22	3	3	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps		120	TRUE	26	3,139	0.10	0.05	0.05	320	151	170
Valley Stream School District NY	Wheeler Elementary School	21	B	Office Kitchen B14	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	3	2,639	0.04	0.02	0.02	113	55	58
Valley Stream School District NY	Wheeler Elementary School	22	B	Stairs 1	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	8	120	TRUE	12	4,001	0.04	0.02	0.02	172	84	88
Valley Stream School District NY	Wheeler Elementary School	23	B	Stairs 1	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	12	4,001	0.04	0.02	0.02	172	84	88
Valley Stream School District NY	Wheeler Elementary School	24	B	Stairs 1	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	8	120	TRUE	12	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Wheeler Elementary School	25	B	Stairs 1	1222T8	LT22L12	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps, Lens		120	TRUE	12	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Wheeler Elementary School	26	B	Stairs 2	2424T8-28	LT24	1	1	0.0430	0.0210	2x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	12	4,001	0.04	0.02	0.02	172	84	88
Valley Stream School District NY	Wheeler Elementary School	27	B	Stairs 2	1414T8-28	LT14	2	2	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp		120	TRUE	12	4,001	0.04	0.02	0.02	176	84	92
Valley Stream School District NY	Wheeler Elementary School	28	B	Stairs 2	1414T8BB-28	LT14MI	1	1	0.0220	0.0105	1x4, 1-Lamp T8, BB, 28w	LED Int. Driver Lamp, (1) 4' Lamp, MI		120	TRUE	12	4,001	0.02	0.01	0.01	88	42	46
Valley Stream School District NY	Wheeler Elementary School	29	B	Stairs 2	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.00	0.00	-	35	35	-
Valley Stream School District NY	Wheeler Elementary School	30	B	Stairs 3	1414T8-28	LT14	1	1	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp		120	TRUE	12	4,001	0.02	0.01	0.01	88	42	46
Valley Stream School District NY	Wheeler Elementary School	31	B	Classroom Music B15	1824T8-28	LT24	13	13	0.0430	0.0210	1x8, 2-Lamp T8 4', 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	25	2,054	0.56	0.27	0.29	1,148	561	587
Valley Stream School District NY	Wheeler Elementary School	32	B	Classroom Music B15	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.00	0.00	-	35	35	-
Valley Stream School District NY	Wheeler Elementary School	33	B	Storage B15.1	1824T8-28	LT24	1	1	0.0430	0.0210	1x8, 2-Lamp T8 4', 28w	LED Int. Driver Lamps, (2) 4' Lamps	30	120	TRUE	7	851	0.04	0.02	0.02	37	18	19
Valley Stream School District NY	Wheeler Elementary School	34	B	Storage B15.1	1414T8-28	LT14	1	1	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp		120	TRUE	7	851	0.02	0.01	0.01	19	9	10
Valley Stream School District NY	Wheeler Elementary School	35	B	Office B15.2	1824T8-28	LT24	1	1	0.0430	0.0210	1x8, 2-Lamp T8 4', 28w	LED Int. Driver Lamps, (2) 4' Lamps	15	120	TRUE	3	2,639	0.04	0.02	0.02	113	55	58

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Site Name	Building Name	Index	Floor	Location	Existing Code	Proposed Code	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Existing Foot Candles	Volts	Included in Project	Hour Code	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Valley Stream School District NY	Wheeler Elementary School	36	B	Storage B15.3	1824T8-28	LT24	1	1	0.0430	0.0210	1x8, 2-Lamp T8 4', 28w	LED Int. Driver Lamps, (2) 4' Lamps	20	120	TRUE	7	851	0.04	0.02	0.02	37	18	19
Valley Stream School District NY	Wheeler Elementary School	37	B	Storage B17	1222T8	LT22	2	2	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	14	120	TRUE	7	851	0.07	0.03	0.04	58	27	31
Valley Stream School District NY	Wheeler Elementary School	38	B	Storage B17.1	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	15	120	TRUE	7	851	0.03	0.02	0.02	29	14	15
Valley Stream School District NY	Wheeler Elementary School	39	B	Storage B16	1424T8-28	1414INDLT-TYPEB	2	2	0.0430	0.0105	1x4, 2-Lamp T8, 28w	New 1x4 w/ (1) 4' LED Lamp, Int. Driver		120	TRUE	7	851	0.09	0.02	0.07	73	18	55
Valley Stream School District NY	Wheeler Elementary School	40	B	Stairs B18	1414T8-28	LT14	1	1	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp		120	TRUE	12	4,001	0.02	0.01	0.01	88	42	46
Valley Stream School District NY	Wheeler Elementary School	41	B	Gym B9	1844T8-28	LT44	11	11	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	26	120	TRUE	27	3,496	0.95	0.46	0.48	3,307	1,615	1,692
Valley Stream School District NY	Wheeler Elementary School	42	B	Gym B9	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.01	0.01	-	70	70	-
Valley Stream School District NY	Wheeler Elementary School	43	1	Storage 1	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	29	120	TRUE	4	4,160	0.04	0.02	0.02	179	87	92
Valley Stream School District NY	Wheeler Elementary School	44	1	Storage 1	1222T8	LT22	2	2	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps		120	TRUE	4	4,160	0.07	0.03	0.04	283	133	150
Valley Stream School District NY	Wheeler Elementary School	45	1	Music Office 2	1844T8-28	LT44	2	2	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	25	120	TRUE	3	2,639	0.17	0.08	0.09	454	222	232
Valley Stream School District NY	Wheeler Elementary School	46	1	Auditorium 3	1844T8-28	LT44	8	8	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	19	120	TRUE	28	1,080	0.69	0.34	0.35	743	363	380
Valley Stream School District NY	Wheeler Elementary School	47	1	Auditorium 3	CFL13X12	LALLOX12	5	5	0.1560	0.0780	(12) CFL 13w	LED Lamp, A-Line, LLO, x12		120	TRUE	28	1,080	0.78	0.39	0.39	842	421	421
Valley Stream School District NY	Wheeler Elementary School	48	1	Auditorium 3	K-LED	NR	6	6	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.02	0.02	-	210	210	-
Valley Stream School District NY	Wheeler Elementary School	49	1	Stage 4	1844T8-28	LT44	9	9	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	50	120	TRUE	28	1,080	0.77	0.38	0.40	836	408	428
Valley Stream School District NY	Wheeler Elementary School	50	1	Stage 4	I75	LR38NLO	4	4	0.0750	0.0180	Inc 75w	LED Lamp, R/PAR38, NLO		120	TRUE	28	1,080	0.30	0.07	0.23	324	78	246
Valley Stream School District NY	Wheeler Elementary School	51	1	Storage 5	1844T8-28	LT44	1	1	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	34	120	TRUE	28	1,080	0.09	0.04	0.04	93	45	48
Valley Stream School District NY	Wheeler Elementary School	52	1	Storage 6	1844T8-28	LT44	1	1	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	34	120	TRUE	28	1,080	0.09	0.04	0.04	93	45	48
Valley Stream School District NY	Wheeler Elementary School	53	1	Storage 7	1844T8-28	LT44	1	1	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps		120	TRUE	7	851	0.09	0.04	0.04	73	36	37
Valley Stream School District NY	Wheeler Elementary School	54	1	Storage 7	1414T8-28	LT14	2	2	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	58	120	TRUE	7	851	0.04	0.02	0.02	37	18	20
Valley Stream School District NY	Wheeler Elementary School	55	1	Gym 8	1464T5	LEDHB140WG	12	12	0.3520	0.1410	1x4, 6-Lamp T5	LED High Bay, 140w, Wire Guard	53	120	TRUE	27	3,496	4.22	1.69	2.53	14,767	5,915	8,852
Valley Stream School District NY	Wheeler Elementary School	56	1	Gym 8	K-LED	NR	4	4	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.02	0.02	-	140	140	-
Valley Stream School District NY	Wheeler Elementary School	57	1	Gym Office 9	1844T8-28	LT44	2	2	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	30	120	TRUE	3	2,639	0.17	0.08	0.09	454	222	232
Valley Stream School District NY	Wheeler Elementary School	58	1	Storage 9.1	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	10	120	TRUE	7	851	0.03	0.02	0.02	29	14	15
Valley Stream School District NY	Wheeler Elementary School	59	1	Vestibule V1	1844T8-28	LT44	1	1	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps		120	TRUE	12	4,001	0.09	0.04	0.04	344	168	176
Valley Stream School District NY	Wheeler Elementary School	60	1	Vestibule V1	1824T8-28	LT24	1	1	0.0430	0.0210	1x8, 2-Lamp T8 4', 28w	LED Int. Driver Lamps, (2) 4' Lamps	22	120	TRUE	12	4,001	0.04	0.02	0.02	172	84	88
Valley Stream School District NY	Wheeler Elementary School	61	1	Vestibule V1	1414T8BB-28	LT14MI	1	1	0.0220	0.0105	1x4, 1-Lamp T8, BB, 28w	LED Int. Driver Lamp, (1) 4' Lamp, MI		120	TRUE	12	4,001	0.02	0.01	0.01	88	42	46
Valley Stream School District NY	Wheeler Elementary School	62	1	Classroom 113	1844T8-28	LT44	6	6	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps		120	TRUE	125	1,752	0.52	0.25	0.26	904	442	463
Valley Stream School District NY	Wheeler Elementary School	63	1	Classroom 113	1424T8-28	LT24	2	2	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	43	120	TRUE	125	1,752	0.09	0.04	0.04	151	74	77
Valley Stream School District NY	Wheeler Elementary School	64	1	Vestibule V2	1844T8-28	LT44	1	1	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	28	120	TRUE	12	4,001	0.09	0.04	0.04	344	168	176
Valley Stream School District NY	Wheeler Elementary School	65	1	Nurse 10	1844T8-28	LT44	2	2	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	26	120	TRUE	3	2,639	0.17	0.08	0.09	454	222	232
Valley Stream School District NY	Wheeler Elementary School	66	1	Bath 10. 1	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	29	120	TRUE	5	1,040	0.04	0.02	0.02	45	22	23
Valley Stream School District NY	Wheeler Elementary School	67	1	Classroom 111	1844T8-28	LT44	6	6	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps		120	TRUE	125	1,752	0.52	0.25	0.26	904	442	463

Exhibit G-5 - CO #1

Valley Stream UFSD 13
Exhibit G-5-1
ECM 1 - LED Lighting Upgrade
Lighting Line by Line

Site Name	Building Name	Index	Floor	Location	Existing Code	Proposed Code	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Existing Foot Candles	Volts	Included in Project	Hour Code	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Valley Stream School District NY	Wheeler Elementary School	68	1	Classroom 111	1424T8-28	LT24	2	2	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	43	120	TRUE	125	1,752	0.09	0.04	0.04	151	74	77
Valley Stream School District NY	Wheeler Elementary School	69	1	Classroom 109	1844T8-28	LT44	6	6	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps		120	TRUE	125	1,752	0.52	0.25	0.26	904	442	463
Valley Stream School District NY	Wheeler Elementary School	70	1	Classroom 109	1424T8-28	LT24	2	2	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	43	120	TRUE	125	1,752	0.09	0.04	0.04	151	74	77
Valley Stream School District NY	Wheeler Elementary School	71	1	Classroom 11	1844T8-28	LT44	4	4	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	60	120	TRUE	25	2,054	0.34	0.17	0.18	707	345	362
Valley Stream School District NY	Wheeler Elementary School	72	1	Safe 11.1	1100	LALLO	1	1	0.1000	0.0065	Inc 100w	LED Lamp, A-Line, LLO		120	TRUE	7	851	0.10	0.01	0.09	85	6	80
Valley Stream School District NY	Wheeler Elementary School	73	1	Antiroom 12	1844T8-28	LT44	1	1	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps		120	TRUE	3	2,639	0.09	0.04	0.04	227	111	116
Valley Stream School District NY	Wheeler Elementary School	74	1	Classroom 13	1844T8-28	LT44	1	1	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps		120	TRUE	3	2,639	0.09	0.04	0.04	227	111	116
Valley Stream School District NY	Wheeler Elementary School	75	1	Bath 13.1	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	16	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Wheeler Elementary School	76	1	Vestibule V3	1844T8-28	LT44	1	1	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	20	120	TRUE	12	4,001	0.09	0.04	0.04	344	168	176
Valley Stream School District NY	Wheeler Elementary School	77	1	Classroom 108	1844T8-28	LT44	6	6	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	40	120	TRUE	125	1,752	0.52	0.25	0.26	904	442	463
Valley Stream School District NY	Wheeler Elementary School	78	1	Storage 108.1	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	20	120	TRUE	7	851	0.04	0.02	0.02	37	18	19
Valley Stream School District NY	Wheeler Elementary School	79	1	Bath 14	CFL26	LALLO	2	2	0.0260	0.0065	CFL 26w	LED Lamp, A-Line, LLO		120	TRUE	6	4,001	0.05	0.01	0.04	208	52	156
Valley Stream School District NY	Wheeler Elementary School	80	1	Storage 14.1	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps		120	TRUE	7	851	0.03	0.02	0.02	29	14	15
Valley Stream School District NY	Wheeler Elementary School	81	1	Bath Girls 15	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	14	120	TRUE	1	8,760	0.03	0.02	0.02	298	140	158
Valley Stream School District NY	Wheeler Elementary School	82	1	Bath Girls 15	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	12	120	TRUE	115	2,400	0.04	0.02	0.02	103	50	53
Valley Stream School District NY	Wheeler Elementary School	83	1	Bath Boys 16	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	14	120	TRUE	1	8,760	0.03	0.02	0.02	298	140	158
Valley Stream School District NY	Wheeler Elementary School	84	1	Bath Boys 16	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	12	120	TRUE	115	2,400	0.04	0.02	0.02	103	50	53
Valley Stream School District NY	Wheeler Elementary School	85	1	Jc 16.1	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps		120	TRUE	7	851	0.03	0.02	0.02	29	14	15
Valley Stream School District NY	Wheeler Elementary School	86	1	Classroom 110	1844T8-28	LT44	6	6	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	42	120	TRUE	125	1,752	0.52	0.25	0.26	904	442	463
Valley Stream School District NY	Wheeler Elementary School	87	1	Classroom 110	1424T8-28	LT24	2	2	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	125	1,752	0.09	0.04	0.04	151	74	77
Valley Stream School District NY	Wheeler Elementary School	88	1	Faculty 112	1844T8-28	LT44	6	6	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	40	120	TRUE	103	2,639	0.52	0.25	0.26	1,362	665	697
Valley Stream School District NY	Wheeler Elementary School	89	1	Faculty 112	1424T8-28	LT24	2	2	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	103	2,639	0.09	0.04	0.04	227	111	116
Valley Stream School District NY	Wheeler Elementary School	90	1	Faculty 112	VEND-CD	NR	1	1	0.3390	0.3390	Cold Drink Machine	No Retrofit		120	FALSE	1	8,760	0.34	0.34	-	2,970	2,970	-
Valley Stream School District NY	Wheeler Elementary School	91	1	Bath Girls 17	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	14	120	TRUE	1	8,760	0.03	0.02	0.02	298	140	158
Valley Stream School District NY	Wheeler Elementary School	92	1	Bath Girls 17	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	12	120	TRUE	115	2,400	0.04	0.02	0.02	103	50	53
Valley Stream School District NY	Wheeler Elementary School	93	1	Classroom 114	1844T8-28	LT44	6	6	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	42	120	TRUE	125	1,752	0.52	0.25	0.26	904	442	463
Valley Stream School District NY	Wheeler Elementary School	94	1	Classroom 114	1424T8-28	LT24	2	2	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	125	1,752	0.09	0.04	0.04	151	74	77
Valley Stream School District NY	Wheeler Elementary School	95	1	Hall H1	1844T8-28	LT44	9	9	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps		120	TRUE	12	4,001	0.77	0.38	0.40	3,097	1,512	1,584
Valley Stream School District NY	Wheeler Elementary School	96	1	Hall H1	K-LED	NR	5	5	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.02	0.02	-	175	175	-
Valley Stream School District NY	Wheeler Elementary School	97	1	Hall H1	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	12	4,001	0.04	0.02	0.02	172	84	88
Valley Stream School District NY	Wheeler Elementary School	98	1	Vestibule V4	1844T8-28	LT44	1	1	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	31	120	TRUE	12	4,001	0.09	0.04	0.04	344	168	176
Valley Stream School District NY	Wheeler Elementary School	99	1	Office Principal 18	1844T8-28	LT44	3	3	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	30	120	TRUE	103	2,639	0.26	0.13	0.13	681	333	348

Exhibit G-5 - CO #1

Valley Stream UFSD 13
Exhibit G-5-1
ECM 1 - LED Lighting Upgrade
Lighting Line by Line

Site Name	Building Name	Index	Floor	Location	Existing Code	Proposed Code	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Existing Foot Candles	Volts	Included in Project	Hour Code	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Valley Stream School District NY	Wheeler Elementary School	100	1	Main Office 19	1844T8-28	LT44	6	6	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	47	120	TRUE	3	2,639	0.52	0.25	0.26	1,362	665	697
Valley Stream School District NY	Wheeler Elementary School	101	1	Bath 19.1	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	20	120	TRUE	15	4,001	0.04	0.02	0.02	172	84	88
Valley Stream School District NY	Wheeler Elementary School	102	1	Office 19.2	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	30	120	TRUE	3	2,639	0.04	0.02	0.02	113	55	58
Valley Stream School District NY	Wheeler Elementary School	103	1	Office 19.2	1844T8-28	LT44	1	1	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps		120	TRUE	3	2,639	0.09	0.04	0.04	227	111	116
Valley Stream School District NY	Wheeler Elementary School	104	1	Vestibule V5	2424T8-28	LT24	2	2	0.0430	0.0210	2x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	12	120	TRUE	1	8,760	0.09	0.04	0.04	753	368	385
Valley Stream School District NY	Wheeler Elementary School	105	1	Hall H2	1844T8-28	LT44	3	3	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	34	120	TRUE	12	4,001	0.26	0.13	0.13	1,032	504	528
Valley Stream School District NY	Wheeler Elementary School	106	1	Hall H2	K-LED	NR	3	3	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.01	0.01	-	105	105	-
Valley Stream School District NY	Wheeler Elementary School	107	1	Storage 1c	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	7	851	0.04	0.02	0.02	37	18	19
Valley Stream School District NY	Wheeler Elementary School	108	1	Storage 1c	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps		120	TRUE	7	851	0.03	0.02	0.02	29	14	15
Valley Stream School District NY	Wheeler Elementary School	109	1	Hall H3	2424T8-28	LT24	6	6	0.0430	0.0210	2x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	36	120	TRUE	12	4,001	0.26	0.13	0.13	1,032	504	528
Valley Stream School District NY	Wheeler Elementary School	110	1	Bath 20	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	22	120	TRUE	15	4,001	0.04	0.02	0.02	172	84	88
Valley Stream School District NY	Wheeler Elementary School	111	1	Jc 21	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	10	120	TRUE	7	851	0.03	0.02	0.02	29	14	15
Valley Stream School District NY	Wheeler Elementary School	112	1	Storage 22	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	10	120	TRUE	7	851	0.03	0.02	0.02	29	14	15
Valley Stream School District NY	Wheeler Elementary School	113	1	Classroom 107	1824T8-28	LT24	11	11	0.0430	0.0210	1x8, 2-Lamp T8 4', 28w	LED Int. Driver Lamps, (2) 4' Lamps	39	120	TRUE	125	1,752	0.47	0.23	0.24	829	405	424
Valley Stream School District NY	Wheeler Elementary School	114	1	Bath 107.1	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	16	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Wheeler Elementary School	115	1	Storage 107.2	1414T8-28	LT14	1	1	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp		120	TRUE	7	851	0.02	0.01	0.01	19	9	10
Valley Stream School District NY	Wheeler Elementary School	116	1	Classroom 105	1824T8-28	LT24	11	11	0.0430	0.0210	1x8, 2-Lamp T8 4', 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.47	0.23	0.24	829	405	424
Valley Stream School District NY	Wheeler Elementary School	117	1	Bath 105.1	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	16	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Wheeler Elementary School	118	1	Storage 105.2	1414T8-28	LT14	1	1	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp		120	TRUE	7	851	0.02	0.01	0.01	19	9	10
Valley Stream School District NY	Wheeler Elementary School	119	1	Classroom 103	1824T8-28	LT24	11	11	0.0430	0.0210	1x8, 2-Lamp T8 4', 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.47	0.23	0.24	829	405	424
Valley Stream School District NY	Wheeler Elementary School	120	1	Bath 103.1	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	16	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Wheeler Elementary School	121	1	Storage 103.2	1414T8-28	LT14	1	1	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp		120	TRUE	7	851	0.02	0.01	0.01	19	9	10
Valley Stream School District NY	Wheeler Elementary School	122	1	Classroom 101	1824T8-28	LT24	11	11	0.0430	0.0210	1x8, 2-Lamp T8 4', 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.47	0.23	0.24	829	405	424
Valley Stream School District NY	Wheeler Elementary School	123	1	Bath 101.1	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	16	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Wheeler Elementary School	124	1	Storage 101.2	1414T8-28	LT14	1	1	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp		120	TRUE	7	851	0.02	0.01	0.01	19	9	10
Valley Stream School District NY	Wheeler Elementary School	125	1	Classroom 102	1824T8-28	LT24	8	8	0.0430	0.0210	1x8, 2-Lamp T8 4', 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.34	0.17	0.18	603	294	308
Valley Stream School District NY	Wheeler Elementary School	126	1	Classroom 102	1414T8-28	LT14	1	1	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp		120	TRUE	125	1,752	0.02	0.01	0.01	39	18	20
Valley Stream School District NY	Wheeler Elementary School	127	1	Bath 102.1	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps		120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Wheeler Elementary School	128	1	Classroom 104	1824T8-28	LT24	8	8	0.0430	0.0210	1x8, 2-Lamp T8 4', 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.34	0.17	0.18	603	294	308
Valley Stream School District NY	Wheeler Elementary School	129	1	Classroom 104	1414T8-28	LT14	1	1	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp		120	TRUE	125	1,752	0.02	0.01	0.01	39	18	20
Valley Stream School District NY	Wheeler Elementary School	130	1	Bath 104.1	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps		120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Wheeler Elementary School	131	1	Classroom 106	1824T8-28	LT24	8	8	0.0430	0.0210	1x8, 2-Lamp T8 4', 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.34	0.17	0.18	603	294	308

Exhibit G-5 - CO #1

Valley Stream UFSD 13
Exhibit G-5-1
ECM 1 - LED Lighting Upgrade
Lighting Line by Line

Site Name	Building Name	Index	Floor	Location	Existing Code	Proposed Code	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Existing Foot Candles	Volts	Included in Project	Hour Code	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Valley Stream School District NY	Wheeler Elementary School	132	1	Classroom 106	1414T8-28	LT14	1	1	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp		120	TRUE	125	1,752	0.02	0.01	0.01	39	18	20
Valley Stream School District NY	Wheeler Elementary School	133	1	Bath 106.1	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps		120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Wheeler Elementary School	134	1	Office 23	2424T8-28	LT24	3	3	0.0430	0.0210	2x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	50	120	TRUE	103	2,639	0.13	0.06	0.07	340	166	174
Valley Stream School District NY	Wheeler Elementary School	135	1	Hall H4	2424T8-28	LT24	22	22	0.0430	0.0210	2x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	35	120	TRUE	12	4,001	0.95	0.46	0.48	3,785	1,848	1,936
Valley Stream School District NY	Wheeler Elementary School	136	1	Hall H4	1824T8-28	LT24	4	4	0.0430	0.0210	1x8, 2-Lamp T8 4', 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	12	4,001	0.17	0.08	0.09	688	336	352
Valley Stream School District NY	Wheeler Elementary School	137	1	Hall H4	K-LED	NR	4	4	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.02	0.02	-	140	140	-
Valley Stream School District NY	Wheeler Elementary School	138	1	Stairs 4	2424T8-28	LT24	2	2	0.0430	0.0210	2x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	12	4,001	0.09	0.04	0.04	344	168	176
Valley Stream School District NY	Wheeler Elementary School	139	1	Stairs 4	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.00	0.00	-	35	35	-
Valley Stream School District NY	Wheeler Elementary School	140	1	Stairs 4	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	12	4,001	0.04	0.02	0.02	172	84	88
Valley Stream School District NY	Wheeler Elementary School	141	2	Classroom 202	1824T8-28	LT24	9	9	0.0430	0.0210	1x8, 2-Lamp T8 4', 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.39	0.19	0.20	678	331	347
Valley Stream School District NY	Wheeler Elementary School	142	2	Classroom 204	1824T8-28	LT24	9	9	0.0430	0.0210	1x8, 2-Lamp T8 4', 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.39	0.19	0.20	678	331	347
Valley Stream School District NY	Wheeler Elementary School	143	2	Classroom 206	1824T8-28	LT24	9	9	0.0430	0.0210	1x8, 2-Lamp T8 4', 28w	LED Int. Driver Lamps, (2) 4' Lamps	38	120	TRUE	125	1,752	0.39	0.19	0.20	678	331	347
Valley Stream School District NY	Wheeler Elementary School	144	2	Bath Girls 24	1414T8-28	LT14	2	2	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	18	120	TRUE	115	2,400	0.04	0.02	0.02	106	50	55
Valley Stream School District NY	Wheeler Elementary School	145	2	Jc 25	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps		120	TRUE	7	851	0.03	0.02	0.02	29	14	15
Valley Stream School District NY	Wheeler Elementary School	146	2	Bath Boys 26	1414T8-28	LT14	2	2	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	18	120	TRUE	115	2,400	0.04	0.02	0.02	106	50	55
Valley Stream School District NY	Wheeler Elementary School	147	2	Classroom 27	2424T8-28	LT24	4	4	0.0430	0.0210	2x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	71	120	TRUE	103	2,639	0.17	0.08	0.09	454	222	232
Valley Stream School District NY	Wheeler Elementary School	148	2	Storage 28	1222T8	LT22	2	2	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	20	120	TRUE	7	851	0.07	0.03	0.04	58	27	31
Valley Stream School District NY	Wheeler Elementary School	149	2	Classroom 208	1824T8-28	LT24	9	9	0.0430	0.0210	1x8, 2-Lamp T8 4', 28w	LED Int. Driver Lamps, (2) 4' Lamps	38	120	TRUE	125	1,752	0.39	0.19	0.20	678	331	347
Valley Stream School District NY	Wheeler Elementary School	150	2	Classroom 207	1824T8-28	LT24	9	9	0.0430	0.0210	1x8, 2-Lamp T8 4', 28w	LED Int. Driver Lamps, (2) 4' Lamps	38	120	TRUE	125	1,752	0.39	0.19	0.20	678	331	347
Valley Stream School District NY	Wheeler Elementary School	151	2	Classroom 205	1824T8-28	LT24	9	9	0.0430	0.0210	1x8, 2-Lamp T8 4', 28w	LED Int. Driver Lamps, (2) 4' Lamps	38	120	TRUE	125	1,752	0.39	0.19	0.20	678	331	347
Valley Stream School District NY	Wheeler Elementary School	152	2	Classroom 203	1824T8-28	LT24	9	9	0.0430	0.0210	1x8, 2-Lamp T8 4', 28w	LED Int. Driver Lamps, (2) 4' Lamps	38	120	TRUE	125	1,752	0.39	0.19	0.20	678	331	347
Valley Stream School District NY	Wheeler Elementary School	153	2	Classroom 201	1824T8-28	LT24	9	9	0.0430	0.0210	1x8, 2-Lamp T8 4', 28w	LED Int. Driver Lamps, (2) 4' Lamps	38	120	TRUE	125	1,752	0.39	0.19	0.20	678	331	347
Valley Stream School District NY	Wheeler Elementary School	154	2	Hall H5	1424T8-28	LT24	4	4	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	55	120	TRUE	12	4,001	0.17	0.08	0.09	688	336	352
Valley Stream School District NY	Wheeler Elementary School	155	2	Hall H5	1844T8-28	LT44	6	6	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps		120	TRUE	12	4,001	0.52	0.25	0.26	2,065	1,008	1,056
Valley Stream School District NY	Wheeler Elementary School	156	2	Hall H5	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.00	0.00	-	35	35	-
Valley Stream School District NY	Wheeler Elementary School	157	2	Hall H5	1824T8-28	LT24	3	3	0.0430	0.0210	1x8, 2-Lamp T8 4', 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	12	4,001	0.13	0.06	0.07	516	252	264
Valley Stream School District NY	Wheeler Elementary School	158	2	Hall H5	1414T8-28	LT14	1	1	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp		120	TRUE	12	4,001	0.02	0.01	0.01	88	42	46
Valley Stream School District NY	Wheeler Elementary School	159	2	Classroom 210	1844T8-28	LT44	6	6	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	45	120	TRUE	125	1,752	0.52	0.25	0.26	904	442	463
Valley Stream School District NY	Wheeler Elementary School	160	2	Classroom 210	1424T8-28	LT24	2	2	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	125	1,752	0.09	0.04	0.04	151	74	77
Valley Stream School District NY	Wheeler Elementary School	161	2	Storage 2c	1414T8-28	LT14	1	1	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp		120	TRUE	7	851	0.02	0.01	0.01	19	9	10
Valley Stream School District NY	Wheeler Elementary School	162	2	Bath 29	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps		120	TRUE	115	2,400	0.03	0.02	0.02	82	38	43
Valley Stream School District NY	Wheeler Elementary School	163	2	Bath 29	1824T8-28	LT24	1	1	0.0430	0.0210	1x8, 2-Lamp T8 4', 28w	LED Int. Driver Lamps, (2) 4' Lamps	20	120	TRUE	115	2,400	0.04	0.02	0.02	103	50	53

Exhibit G-5 - CO #1

Valley Stream UFSD 13
Exhibit G-5-1
ECM 1 - LED Lighting Upgrade
Lighting Line by Line

Site Name	Building Name	Index	Floor	Location	Existing Code	Proposed Code	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Existing Foot Candles	Volts	Included in Project	Hour Code	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Valley Stream School District NY	Wheeler Elementary School	164	2	Bath 29	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	115	2,400	0.04	0.02	0.02	103	50	53
Valley Stream School District NY	Wheeler Elementary School	165	2	Jc 29.1	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	8	120	TRUE	7	851	0.03	0.02	0.02	29	14	15
Valley Stream School District NY	Wheeler Elementary School	166	2	Storage 2d	1414T8-28	LT14	1	1	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	7	120	TRUE	7	851	0.02	0.01	0.01	19	9	10
Valley Stream School District NY	Wheeler Elementary School	167	2	Storage 30	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	15	120	TRUE	7	851	0.04	0.02	0.02	37	18	19
Valley Stream School District NY	Wheeler Elementary School	168	2	Library 31	2424T8-28	LT24	6	6	0.0430	0.0210	2x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	30	120	TRUE	25	2,054	0.26	0.13	0.13	530	259	271
Valley Stream School District NY	Wheeler Elementary School	169	2	Library 31	2424T8-28	LT24	12	12	0.0430	0.0210	2x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	25	2,054	0.52	0.25	0.26	1,060	518	542
Valley Stream School District NY	Wheeler Elementary School	170	2	Library 31	2424T8-28	LT24	12	12	0.0430	0.0210	2x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	25	2,054	0.52	0.25	0.26	1,060	518	542
Valley Stream School District NY	Wheeler Elementary School	171	2	Library 31	K-LED	NR	3	3	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.01	0.01	-	105	105	-
Valley Stream School District NY	Wheeler Elementary School	172	2	Office 31.1	2424T8-28	LT24	2	2	0.0430	0.0210	2x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	103	2,639	0.09	0.04	0.04	227	111	116
Valley Stream School District NY	Wheeler Elementary School	173	2	Office 31.1	2222T8	LT22	1	1	0.0340	0.0160	2x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	35	120	TRUE	103	2,639	0.03	0.02	0.02	90	42	48
Valley Stream School District NY	Wheeler Elementary School	174	2	Classroom 32	1844T8-28	LT44	9	9	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	51	120	TRUE	25	2,054	0.77	0.38	0.40	1,590	776	813
Valley Stream School District NY	Wheeler Elementary School	175	2	Classroom 32	1424T8-28	LT24	3	3	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	25	2,054	0.13	0.06	0.07	265	129	136
Valley Stream School District NY	Wheeler Elementary School	176	2	Classroom 211	1844T8-28	LT44	6	6	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	46	120	TRUE	125	1,752	0.52	0.25	0.26	904	442	463
Valley Stream School District NY	Wheeler Elementary School	177	2	Classroom 211	1424T8-28	LT24	2	2	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	125	1,752	0.09	0.04	0.04	151	74	77
Valley Stream School District NY	Wheeler Elementary School	178	2	Classroom 209	1844T8-28	LT44	6	6	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	46	120	TRUE	125	1,752	0.52	0.25	0.26	904	442	463
Valley Stream School District NY	Wheeler Elementary School	179	2	Classroom 209	1424T8-28	LT24	2	2	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	125	1,752	0.09	0.04	0.04	151	74	77
Valley Stream School District NY	Wheeler Elementary School	180	2	Hall H6	1844T8-28	LT44	6	6	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	25	120	TRUE	12	4,001	0.52	0.25	0.26	2,065	1,008	1,056
Valley Stream School District NY	Wheeler Elementary School	181	2	Hall H6	K-LED	NR	3	3	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.01	0.01	-	105	105	-
Valley Stream School District NY	Wheeler Elementary School	182	2	Storage2e	1414T8-28	LT14	1	1	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	12	120	TRUE	7	851	0.02	0.01	0.01	19	9	10
Valley Stream School District NY	Wheeler Elementary School	183	2	Bath Girls 33	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps		120	TRUE	115	2,400	0.03	0.02	0.02	82	38	43
Valley Stream School District NY	Wheeler Elementary School	184	2	Bath Girls 33	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	22	120	TRUE	115	2,400	0.04	0.02	0.02	103	50	53
Valley Stream School District NY	Wheeler Elementary School	185	2	Office 34	1844T8-28	LT44	2	2	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	25	120	TRUE	3	2,639	0.17	0.08	0.09	454	222	232
Valley Stream School District NY	Wheeler Elementary School	186	2	Classroom 216	1844T8-28	LT44	6	6	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	43	120	TRUE	125	1,752	0.52	0.25	0.26	904	442	463
Valley Stream School District NY	Wheeler Elementary School	187	2	Classroom 216	1424T8-28	LT24	2	2	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	125	1,752	0.09	0.04	0.04	151	74	77
Valley Stream School District NY	Wheeler Elementary School	188	2	Classroom 218	1844T8-28	LT44	6	6	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	43	120	TRUE	125	1,752	0.52	0.25	0.26	904	442	463
Valley Stream School District NY	Wheeler Elementary School	189	2	Classroom 218	1424T8-28	LT24	2	2	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	125	1,752	0.09	0.04	0.04	151	74	77
Valley Stream School District NY	Wheeler Elementary School	190	2	Bath Boys 34	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps		120	TRUE	115	2,400	0.03	0.02	0.02	82	38	43
Valley Stream School District NY	Wheeler Elementary School	191	2	Bath Boys 34	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	115	2,400	0.04	0.02	0.02	103	50	53
Valley Stream School District NY	Wheeler Elementary School	192	2	Jc 35.1	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps		120	TRUE	7	851	0.03	0.02	0.02	29	14	15
Valley Stream School District NY	Wheeler Elementary School	193	2	Classroom 220	1844T8-28	LT44	6	6	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	43	120	TRUE	125	1,752	0.52	0.25	0.26	904	442	463
Valley Stream School District NY	Wheeler Elementary School	194	2	Classroom 220	1424T8-28	LT24	2	2	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	125	1,752	0.09	0.04	0.04	151	74	77
Valley Stream School District NY	Wheeler Elementary School	195	2	Classroom 219	1844T8-28	LT44	6	6	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	43	120	TRUE	125	1,752	0.52	0.25	0.26	904	442	463

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Valley Stream UFSD 13
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ECM 1 - LED Lighting Upgrade
Lighting Line by Line

Site Name	Building Name	Index	Floor	Location	Existing Code	Proposed Code	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Existing Foot Candles	Volts	Included in Project	Hour Code	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Valley Stream School District NY	Wheeler Elementary School	196	2	Office 2f	1844T8-28	LT44	2	2	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps		120	TRUE	3	2,639	0.17	0.08	0.09	454	222	232
Valley Stream School District NY	Wheeler Elementary School	197	2	Classroom 217	1844T8-28	LT44	4	4	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	35	120	TRUE	125	1,752	0.34	0.17	0.18	603	294	308
Valley Stream School District NY	Wheeler Elementary School	198	2	Classroom 217	1424T8-28	LT24	2	2	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	125	1,752	0.09	0.04	0.04	151	74	77
Valley Stream School District NY	Wheeler Elementary School	199	2	Classroom 215	1844T8-28	LT44	6	6	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	43	120	TRUE	125	1,752	0.52	0.25	0.26	904	442	463
Valley Stream School District NY	Wheeler Elementary School	200	2	Classroom 215	1424T8-28	LT24	2	2	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	125	1,752	0.09	0.04	0.04	151	74	77
Valley Stream School District NY	Wheeler Elementary School	201	2	Classroom 214	1844T8-28	LT44	6	6	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	43	120	TRUE	125	1,752	0.52	0.25	0.26	904	442	463
Valley Stream School District NY	Wheeler Elementary School	202	2	Classroom 214	1424T8-28	LT24	2	2	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	125	1,752	0.09	0.04	0.04	151	74	77
Valley Stream School District NY	Wheeler Elementary School	203	2	Office 36	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps		120	TRUE	3	2,639	0.03	0.02	0.02	90	42	48
Valley Stream School District NY	Wheeler Elementary School	204	2	Office 36	1844T8-28	LT44	1	1	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps		120	TRUE	103	2,639	0.09	0.04	0.04	227	111	116
Valley Stream School District NY	Wheeler Elementary School	205	2	Hall H7	1844T8-28	LT44	7	7	0.0860	0.0420	1x8, 4-Lamp T8 4', 28w	LED Int. Driver Lamps, (4) 4' Lamps	24	120	TRUE	12	4,001	0.60	0.29	0.31	2,409	1,176	1,232
Valley Stream School District NY	Wheeler Elementary School	206	2	Hall H7	K-LED	NR	3	3	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.01	0.01	-	105	105	-
Valley Stream School District NY	Wheeler Elementary School	207	2	Stairs 5	1424T8-28	LT24	3	3	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	8	120	TRUE	12	4,001	0.13	0.06	0.07	516	252	264
Valley Stream School District NY	Wheeler Elementary School	208	2	Stairs 6	1424T8-28	LT24	3	3	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	8	120	TRUE	12	4,001	0.13	0.06	0.07	516	252	264
Valley Stream School District NY	Wheeler Elementary School	209	2	Stairs 6	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps		120	TRUE	12	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Wheeler Elementary School	210	2	Stairs 7	1424T8-28	LT24	4	4	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	8	120	TRUE	12	4,001	0.17	0.08	0.09	688	336	352
Valley Stream School District NY	Wheeler Elementary School	211	2	Stairs 7	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.00	0.00	-	35	35	-
Valley Stream School District NY	Wheeler Elementary School	212	Ext	Main Entry Canopy	S100	LEDCAN42	1	1	0.1300	0.0400	HPS 100w	LED 40w Canopy		120	TRUE	10	4,380	0.13	0.04	0.09	569	175	394
Valley Stream School District NY	Wheeler Elementary School	213	Ext	Roof Line Floods	IND100	LEDFL32	5	5	0.1300	0.0300	Induction 100w	LED Flood, 32w		120	TRUE	10	4,380	0.65	0.15	0.50	2,847	657	2,190
Valley Stream School District NY	Wheeler Elementary School	214	Ext	Exit Door	LED18	NR	1	1	0.0180	0.0180	LED 18w	No Retrofit		120	FALSE	10	4,380	0.02	0.02	-	79	79	-
Valley Stream School District NY	Wheeler Elementary School	215	Ext	Exit Door	LED18	NR	1	1	0.0180	0.0180	LED 18w	No Retrofit		120	FALSE	10	4,380	0.02	0.02	-	79	79	-
Valley Stream School District NY	Wheeler Elementary School	216	Ext	Exit Door	S100	LEDFL32	1	1	0.1300	0.0300	HPS 100w	LED Flood, 32w		120	TRUE	10	4,380	0.13	0.03	0.10	569	131	438
Valley Stream School District NY	Wheeler Elementary School	217	Ext	Building Mounted Floods	IND150	LEDFL32	4	4	0.1800	0.0300	Induction 150w	LED Flood, 32w		120	TRUE	10	4,380	0.72	0.12	0.60	3,154	526	2,628
Valley Stream School District NY	Wheeler Elementary School	218	Ext	Roof Line Floods	IND150	LEDFL32	1	1	0.1800	0.0300	Induction 150w	LED Flood, 32w		120	TRUE	10	4,380	0.18	0.03	0.15	788	131	657
Valley Stream School District NY	Wheeler Elementary School	219	Ext	Roof Line Floods	IND100	LEDFL32	1	1	0.1300	0.0300	Induction 100w	LED Flood, 32w		120	TRUE	10	4,380	0.13	0.03	0.10	569	131	438
Valley Stream School District NY	Wheeler Elementary School	220	Ext	Building Mounted Floods	IND150	LEDFL32	2	2	0.1800	0.0300	Induction 150w	LED Flood, 32w		120	TRUE	10	4,380	0.36	0.06	0.30	1,577	263	1,314
Valley Stream School District NY	Wheeler Elementary School	221	Ext	Wall Packs	LPS55	LEDWP40	1	1	0.0600	0.0400	LPS 55w	LED Wall Pack 40		120	TRUE	10	4,380	0.06	0.04	0.02	263	175	88
Valley Stream School District NY	Wheeler Elementary School	222	Ext	Wall Packs	S150	LEDWP40	1	1	0.1880	0.0400	HPS 150w	LED Wall Pack 40		120	TRUE	10	4,380	0.19	0.04	0.15	823	175	648
Valley Stream School District NY	Wheeler Elementary School	223	Ext	Exit Doors	LED18	NR	1	1	0.0180	0.0180	LED 18w	No Retrofit		120	FALSE	10	4,380	0.02	0.02	-	79	79	-
Valley Stream School District NY	Wheeler Elementary School	224	Ext	Exit Doors	CFL26	NR	1	1	0.0260	0.0260	CFL 26w	No Retrofit		120	FALSE	10	4,380	0.03	0.03	-	114	114	-
Valley Stream School District NY	Willow Stream Elementary School	1	2	Classroom 42	1414T8-28	LT14	18	18	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	30	120	TRUE	125	1,752	0.40	0.19	0.21	694	331	363
Valley Stream School District NY	Willow Stream Elementary School	2	2	Bathroom, Women's 42a	1414T8-28	LT14	3	3	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	25	120	TRUE	15	4,001	0.07	0.03	0.03	264	126	138
Valley Stream School District NY	Willow Stream Elementary School	3	2	Jc 64	1414T8-28	LT14	1	1	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	25	120	TRUE	7	851	0.02	0.01	0.01	19	9	10

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Site Name	Building Name	Index	Floor	Location	Existing Code	Proposed Code	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Existing Foot Candles	Volts	Included in Project	Hour Code	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Valley Stream School District NY	Willow Stream Elementary School	4	2	Jc 65	1414T8-28	LT14	1	1	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	25	120	TRUE	7	851	0.02	0.01	0.01	19	9	10
Valley Stream School District NY	Willow Stream Elementary School	5	2	Bathroom, Men's 42b	1414T8-28	LT14	3	3	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	25	120	TRUE	15	4,001	0.07	0.03	0.03	264	126	138
Valley Stream School District NY	Willow Stream Elementary School	6	2	Classroom 35	1414T8-28	LT14	18	18	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	30	120	TRUE	125	1,752	0.40	0.19	0.21	694	331	363
Valley Stream School District NY	Willow Stream Elementary School	7	2	Classroom 36	1414T8-28	LT14	18	18	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	30	120	TRUE	125	1,752	0.40	0.19	0.21	694	331	363
Valley Stream School District NY	Willow Stream Elementary School	8	2	Classroom 37	1414T8-28	LT14	18	18	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	30	120	TRUE	125	1,752	0.40	0.19	0.21	694	331	363
Valley Stream School District NY	Willow Stream Elementary School	9	2	Office 37a	1414T8-28	LT14	8	8	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	30	120	TRUE	125	1,752	0.18	0.08	0.09	308	147	161
Valley Stream School District NY	Willow Stream Elementary School	10	2	Classroom 38	1414T8-28	LT14	18	18	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	30	120	TRUE	125	1,752	0.40	0.19	0.21	694	331	363
Valley Stream School District NY	Willow Stream Elementary School	11	2	Classroom 39	1414T8-28	LT14	18	18	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	30	120	TRUE	125	1,752	0.40	0.19	0.21	694	331	363
Valley Stream School District NY	Willow Stream Elementary School	12	2	Classroom 40	1414T8-28	LT14	18	18	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	30	120	TRUE	125	1,752	0.40	0.19	0.21	694	331	363
Valley Stream School District NY	Willow Stream Elementary School	13	2	Classroom 41	1414T8-28	LT14	18	18	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	30	120	TRUE	125	1,752	0.40	0.19	0.21	694	331	363
Valley Stream School District NY	Willow Stream Elementary School	14	2	Storage 41a	1414T8-28	LT14	1	1	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp		120	TRUE	7	851	0.02	0.01	0.01	19	9	10
Valley Stream School District NY	Willow Stream Elementary School	15	2	Hallway 42 To 35	1414T8-28	LT14	24	24	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	20	120	TRUE	12	4,001	0.53	0.25	0.28	2,113	1,008	1,104
Valley Stream School District NY	Willow Stream Elementary School	16	2	Hallway 42 To 35	K-LED	NR	3	3	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.01	0.01	-	105	105	-
Valley Stream School District NY	Willow Stream Elementary School	17	2	Hallway 42 To 35 Display	1414T8-28	LT14	9	9	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	20	120	TRUE	12	4,001	0.20	0.09	0.10	792	378	414
Valley Stream School District NY	Willow Stream Elementary School	18	1	Classroom 18	1414T8-28	LT14	20	20	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	35	120	TRUE	125	1,752	0.44	0.21	0.23	771	368	403
Valley Stream School District NY	Willow Stream Elementary School	19	1	Classroom 18 Bath	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	25	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Willow Stream Elementary School	20	1	Classroom 19	1414T8-28	LT14	17	17	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	35	120	TRUE	125	1,752	0.37	0.18	0.20	655	313	343
Valley Stream School District NY	Willow Stream Elementary School	21	1	Classroom 19 Barh	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	25	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Willow Stream Elementary School	22	1	Classroom 20	1414T8-28	LT14	20	20	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	35	120	TRUE	125	1,752	0.44	0.21	0.23	771	368	403
Valley Stream School District NY	Willow Stream Elementary School	23	1	Classroom 20 Bath	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	25	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Willow Stream Elementary School	24	1	Classroom 21	1414T8-28	LT14	17	17	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	35	120	TRUE	125	1,752	0.37	0.18	0.20	655	313	343
Valley Stream School District NY	Willow Stream Elementary School	25	1	Classroom 21 Bath	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	25	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Willow Stream Elementary School	26	1	Storage 21a	1414T8-28	LT14	1	1	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	25	120	TRUE	7	851	0.02	0.01	0.01	19	9	10
Valley Stream School District NY	Willow Stream Elementary School	27	1	Classroom 22	1414T8-28	LT14	17	17	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	35	120	TRUE	125	1,752	0.37	0.18	0.20	655	313	343
Valley Stream School District NY	Willow Stream Elementary School	28	1	Bathroom, Women's 22a	1414T8-28	LT14	1	1	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	25	120	TRUE	15	4,001	0.02	0.01	0.01	88	42	46
Valley Stream School District NY	Willow Stream Elementary School	29	1	Bathroom, Men's 22b	1414T8-28	LT14	2	2	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	25	120	TRUE	15	4,001	0.04	0.02	0.02	176	84	92
Valley Stream School District NY	Willow Stream Elementary School	30	1	Classroom 22c	1414T8-28	LT14	6	6	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	35	120	TRUE	25	2,054	0.13	0.06	0.07	271	129	142
Valley Stream School District NY	Willow Stream Elementary School	31	1	Multi-purpose Room 22d	1424T8-28	LT24	24	24	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	26	120	TRUE	25	2,054	1.03	0.50	0.53	2,120	1,035	1,085
Valley Stream School District NY	Willow Stream Elementary School	32	1	Multi-purpose Room 22d	K-LED	NR	3	3	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.01	0.01	-	105	105	-
Valley Stream School District NY	Willow Stream Elementary School	33	1	Bathroom 22e	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	25	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Willow Stream Elementary School	34	1	Stage 22f	1424T8-28	LT24	5	5	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	25	120	TRUE	25	2,054	0.22	0.11	0.11	442	216	226
Valley Stream School District NY	Willow Stream Elementary School	35	1	Stage 22f	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	25	120	TRUE	25	2,054	0.03	0.02	0.02	70	33	37

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Site Name	Building Name	Index	Floor	Location	Existing Code	Proposed Code	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Existing Foot Candles	Volts	Included in Project	Hour Code	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Valley Stream School District NY	Willow Stream Elementary School	36	1	Stage 22f	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.00	0.00	-	35	35	-
Valley Stream School District NY	Willow Stream Elementary School	37	1	Bathroom 22g	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	25	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Willow Stream Elementary School	38	1	Jc 63	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	25	120	TRUE	7	851	0.03	0.02	0.02	29	14	15
Valley Stream School District NY	Willow Stream Elementary School	39	1	Hallway 18 To 22	1414T8-28	LT14	12	12	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	20	120	TRUE	12	4,001	0.26	0.13	0.14	1,056	504	552
Valley Stream School District NY	Willow Stream Elementary School	40	1	Hallway 18 To 22	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.01	0.01	-	70	70	-
Valley Stream School District NY	Willow Stream Elementary School	41	1	Hallway 18 To 22 Display	1414T8-28	LT14	6	6	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	20	120	TRUE	12	4,001	0.13	0.06	0.07	528	252	276
Valley Stream School District NY	Willow Stream Elementary School	42	1	Hallway 18 To 22	1222T8	LT22	2	2	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	20	120	TRUE	12	4,001	0.07	0.03	0.04	272	128	144
Valley Stream School District NY	Willow Stream Elementary School	43	1	Classroom 22h	1424T8-28	LT24	24	24	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	60	120	TRUE	125	1,752	1.03	0.50	0.53	1,808	883	925
Valley Stream School District NY	Willow Stream Elementary School	44	1	Classroom 22h Bath	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	25	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Willow Stream Elementary School	45	1	Storage 22i	1424T8-28	LT24	2	2	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	25	120	TRUE	7	851	0.09	0.04	0.04	73	36	37
Valley Stream School District NY	Willow Stream Elementary School	46	1	Storage 22j	1414T8-28	LT14	4	4	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp		120	TRUE	7	851	0.09	0.04	0.05	75	36	39
Valley Stream School District NY	Willow Stream Elementary School	47	1	Classroom 17	1424T8-28	LT24	14	14	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.60	0.29	0.31	1,055	515	540
Valley Stream School District NY	Willow Stream Elementary School	48	1	Classroom 17 Bath	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	25	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Willow Stream Elementary School	49	1	Classroom 15	1424T8-28	LT24	12	12	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.52	0.25	0.26	904	442	463
Valley Stream School District NY	Willow Stream Elementary School	50	1	Classroom 15 Bath	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	25	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Willow Stream Elementary School	51	1	Library 13	2424T8-28	LT24	13	13	0.0430	0.0210	2x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	30	120	TRUE	125	1,752	0.56	0.27	0.29	979	478	501
Valley Stream School District NY	Willow Stream Elementary School	52	1	Library 13	2424T8BB-28	LT24MI	3	3	0.0430	0.0210	2x4, 2-Lamp T8, BB, 28w	LED Int. Driver Lamps, (2) 4' Lamps, MI	30	120	TRUE	125	1,752	0.13	0.06	0.07	226	110	116
Valley Stream School District NY	Willow Stream Elementary School	53	1	Library 13	2222T8BB	LT22MI	1	1	0.0340	0.0160	2x2, 2-Lamp T8, BB	LED Int. Driver Lamps, (2) 2' Lamps, MI	30	120	TRUE	125	1,752	0.03	0.02	0.02	60	28	32
Valley Stream School District NY	Willow Stream Elementary School	54	1	Classroom 9	1424T8-28	LT24	16	16	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.69	0.34	0.35	1,205	589	617
Valley Stream School District NY	Willow Stream Elementary School	55	1	Classroom 7	1424T8-28	LT24	12	12	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.52	0.25	0.26	904	442	463
Valley Stream School District NY	Willow Stream Elementary School	56	1	Classroom 5	1424T8-28	LT24	12	12	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.52	0.25	0.26	904	442	463
Valley Stream School District NY	Willow Stream Elementary School	57	1	Classroom 3	1424T8-28	LT24	12	12	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.52	0.25	0.26	904	442	463
Valley Stream School District NY	Willow Stream Elementary School	58	1	Classroom 1	1424T8-28	LT24	12	12	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.52	0.25	0.26	904	442	463
Valley Stream School District NY	Willow Stream Elementary School	59	1	Classroom 2	1424T8-28	LT24	12	12	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.52	0.25	0.26	904	442	463
Valley Stream School District NY	Willow Stream Elementary School	60	1	Classroom 4	1424T8-28	LT24	12	12	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.52	0.25	0.26	904	442	463
Valley Stream School District NY	Willow Stream Elementary School	61	1	Classroom 6	1424T8-28	LT24	12	12	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.52	0.25	0.26	904	442	463
Valley Stream School District NY	Willow Stream Elementary School	62	1	Classroom 8	1424T8-28	LT24	12	12	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.52	0.25	0.26	904	442	463
Valley Stream School District NY	Willow Stream Elementary School	63	1	Bathroom, Women's 8a	1424T8-28	LT24	3	3	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	30	120	TRUE	115	2,400	0.13	0.06	0.07	310	151	158
Valley Stream School District NY	Willow Stream Elementary School	64	1	Jc 62	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	20	120	TRUE	107	851	0.03	0.02	0.02	29	14	15
Valley Stream School District NY	Willow Stream Elementary School	65	1	Bathroom, Men's 8b	1424T8-28	LT24	3	3	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	30	120	TRUE	115	2,400	0.13	0.06	0.07	310	151	158
Valley Stream School District NY	Willow Stream Elementary School	66	1	Storage 10a	1424T8-28	LT24	2	2	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	25	120	TRUE	7	851	0.09	0.04	0.04	73	36	37
Valley Stream School District NY	Willow Stream Elementary School	67	1	Classroom 10	1424T8-28	LT24	12	12	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.52	0.25	0.26	904	442	463

Exhibit G-5 - CO #1

Valley Stream UFSD 13
Exhibit G-5-1
ECM 1 - LED Lighting Upgrade
Lighting Line by Line

Site Name	Building Name	Index	Floor	Location	Existing Code	Proposed Code	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Existing Foot Candles	Volts	Included in Project	Hour Code	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Valley Stream School District NY	Willow Stream Elementary School	68	1	Classroom 12	1424T8-28	LT24	12	12	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.52	0.25	0.26	904	442	463
Valley Stream School District NY	Willow Stream Elementary School	69	1	Classroom 14	1424T8-28	LT24	12	12	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.52	0.25	0.26	904	442	463
Valley Stream School District NY	Willow Stream Elementary School	70	1	Classroom 14 Bath	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	25	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Willow Stream Elementary School	71	1	Classroom 16	1424T8-28	LT24	17	17	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	60	120	TRUE	125	1,752	0.73	0.36	0.37	1,281	625	655
Valley Stream School District NY	Willow Stream Elementary School	72	1	Hallway 14 To 2	2424T8-28	LT24	34	34	0.0430	0.0210	2x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	26	120	TRUE	12	4,001	1.46	0.71	0.75	5,849	2,857	2,993
Valley Stream School District NY	Willow Stream Elementary School	73	1	Hallway 14 To 2	2222T8	LT22	1	1	0.0340	0.0160	2x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	26	120	TRUE	12	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Willow Stream Elementary School	74	1	Hallway 14 To 2	1424T8-28	LT24	2	2	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	26	120	TRUE	12	4,001	0.09	0.04	0.04	344	168	176
Valley Stream School District NY	Willow Stream Elementary School	75	1	Hallway 14 To 2	K-LED	NR	4	4	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.02	0.02	-	140	140	-
Valley Stream School District NY	Willow Stream Elementary School	76	1	Hallway 14 To 2 Display	1313T8	LT13	2	2	0.0260	0.0120	1x3, 1-Lamp T8	LED Int. Driver Lamp, (1) 3' Lamp	8	120	TRUE	12	4,001	0.05	0.02	0.03	208	96	112
Valley Stream School District NY	Willow Stream Elementary School	77	1	Cafeteria 16b	1444T8-28	LT44	8	8	0.0860	0.0420	1x4, 4-Lamp T8, 28w	LED Int. Driver Lamps, (4) 4' Lamps	35	120	TRUE	26	3,139	0.69	0.34	0.35	2,160	1,055	1,105
Valley Stream School District NY	Willow Stream Elementary School	78	1	Cafeteria 16b	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.01	0.01	-	70	70	-
Valley Stream School District NY	Willow Stream Elementary School	79	1	Kitchen 16c	1424T8-28	LT24	9	9	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	25	120	TRUE	26	3,139	0.39	0.19	0.20	1,215	593	622
Valley Stream School District NY	Willow Stream Elementary School	80	1	Bathroom, Women's 16d	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	25	120	TRUE	15	4,001	0.04	0.02	0.02	172	84	88
Valley Stream School District NY	Willow Stream Elementary School	81	1	Bathroom, Men's 16e	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	25	120	TRUE	15	4,001	0.04	0.02	0.02	172	84	88
Valley Stream School District NY	Willow Stream Elementary School	82	1	Storage 16f	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	25	120	TRUE	7	851	0.04	0.02	0.02	37	18	19
Valley Stream School District NY	Willow Stream Elementary School	83	1	Office Jc 16g	1424T8-28	LT24	4	4	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	25	120	TRUE	4	4,160	0.17	0.08	0.09	716	349	366
Valley Stream School District NY	Willow Stream Elementary School	84	1	Office Jc Bath 16h	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	25	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Willow Stream Elementary School	85	1	Storage 16i	1424T8-28	LT24	2	2	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	25	120	TRUE	7	851	0.09	0.04	0.04	73	36	37
Valley Stream School District NY	Willow Stream Elementary School	86	1	Storage 16j	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	25	120	TRUE	7	851	0.04	0.02	0.02	37	18	19
Valley Stream School District NY	Willow Stream Elementary School	87	1	Garage 16k	1424T8-28	LT24	2	2	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	25	120	TRUE	7	851	0.09	0.04	0.04	73	36	37
Valley Stream School District NY	Willow Stream Elementary School	88	1	Classroom 16l	1424T8-28	LT24	8	8	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.34	0.17	0.18	603	294	308
Valley Stream School District NY	Willow Stream Elementary School	89	1	Nurse 30	1424T8-28	LT24	4	4	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	25	120	TRUE	125	1,752	0.17	0.08	0.09	301	147	154
Valley Stream School District NY	Willow Stream Elementary School	90	1	Office Nurse 30 Bath	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	25	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Willow Stream Elementary School	91	1	Stage 31	1414T8-28	LT14	12	12	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	25	120	TRUE	28	1,080	0.26	0.13	0.14	285	136	149
Valley Stream School District NY	Willow Stream Elementary School	92	1	Stage 31	1222T8	LT22	3	3	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	12	120	TRUE	28	1,080	0.10	0.05	0.05	110	52	58
Valley Stream School District NY	Willow Stream Elementary School	93	1	Stage 31	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.01	0.01	-	70	70	-
Valley Stream School District NY	Willow Stream Elementary School	94	1	Office 32	2424T8-28	LT24	2	2	0.0430	0.0210	2x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	25	2,054	0.09	0.04	0.04	177	86	90
Valley Stream School District NY	Willow Stream Elementary School	95	1	Gym Right 33	1464T5	LEDHB140 WG	5	5	0.3520	0.1410	1x4, 6-Lamp T5	LED High Bay, 140w, Wire Guard	50	120	TRUE	27	3,496	1.76	0.71	1.06	6,153	2,465	3,688
Valley Stream School District NY	Willow Stream Elementary School	96	1	Gym Right 33	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.01	0.01	-	70	70	-
Valley Stream School District NY	Willow Stream Elementary School	97	1	Storage 34	1222T8	LT22	2	2	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	20	120	TRUE	7	851	0.07	0.03	0.04	58	27	31
Valley Stream School District NY	Willow Stream Elementary School	98	1	Gym Left 35	1464T5	LEDHB140 WG	5	5	0.3520	0.1410	1x4, 6-Lamp T5	LED High Bay, 140w, Wire Guard	50	120	TRUE	27	3,496	1.76	0.71	1.06	6,153	2,465	3,688
Valley Stream School District NY	Willow Stream Elementary School	99	1	Gym Left 35	K-LED	NR	2	2	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.01	0.01	-	70	70	-

Exhibit G-5 - CO #1

Valley Stream UFSD 13
Exhibit G-5-1
ECM 1 - LED Lighting Upgrade
Lighting Line by Line

Site Name	Building Name	Index	Floor	Location	Existing Code	Proposed Code	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Existing Foot Candles	Volts	Included in Project	Hour Code	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Valley Stream School District NY	Willow Stream Elementary School	100	1	Copy Room 36a	1414T8-28	LT14	1	1	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp		120	TRUE	12	4,001	0.02	0.01	0.01	88	42	46
Valley Stream School District NY	Willow Stream Elementary School	101	1	Storage 36b	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps		120	TRUE	7	851	0.03	0.02	0.02	29	14	15
Valley Stream School District NY	Willow Stream Elementary School	102	1	Office 36c	1414T8-28	LT14	2	2	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp		120	TRUE	25	2,054	0.04	0.02	0.02	90	43	47
Valley Stream School District NY	Willow Stream Elementary School	103	1	Hallway 31 To Gym	2424T8-28	LT24	4	4	0.0430	0.0210	2x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	20	120	TRUE	12	4,001	0.17	0.08	0.09	688	336	352
Valley Stream School District NY	Willow Stream Elementary School	104	1	Hallway 31 To Gym	K-LED	NR	1	1	0.0040	0.0040	Exit Sign - LED	No Retrofit		120	FALSE	1	8,760	0.00	0.00	-	35	35	-
Valley Stream School District NY	Willow Stream Elementary School	105	1	Office Main 37	1424T8-28	LT24	6	6	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	35	120	TRUE	3	2,639	0.26	0.13	0.13	681	333	348
Valley Stream School District NY	Willow Stream Elementary School	106	1	Office 38	1424T8-28	LT24	5	5	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps		120	TRUE	3	2,639	0.22	0.11	0.11	567	277	290
Valley Stream School District NY	Willow Stream Elementary School	107	1	Office 39 Bath	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps		120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Willow Stream Elementary School	108	1	Office 40	1424T8-28	LT24	3	3	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	35	120	TRUE	3	2,639	0.13	0.06	0.07	340	166	174
Valley Stream School District NY	Willow Stream Elementary School	109	1	Office 40 Bath	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	25	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Willow Stream Elementary School	110	1	Office 41	1424T8-28	LT24	3	3	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	35	120	TRUE	3	2,639	0.13	0.06	0.07	340	166	174
Valley Stream School District NY	Willow Stream Elementary School	111	1	Office 41 Bath	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	25	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Willow Stream Elementary School	112	1	Office 42	1424T8-28	LT24	3	3	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	35	120	TRUE	3	2,639	0.13	0.06	0.07	340	166	174
Valley Stream School District NY	Willow Stream Elementary School	113	1	Bathroom 43	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	25	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Willow Stream Elementary School	114	1	Faculty Room 44	1424T8-28	LT24	12	12	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	8	4,001	0.52	0.25	0.26	2,065	1,008	1,056
Valley Stream School District NY	Willow Stream Elementary School	115	1	Faculty Room 44 Vending	VEND-CD	NR	1	1	0.3390	0.3390	Cold Drink Machine	No Retrofit		120	FALSE	1	8,760	0.34	0.34	-	2,970	2,970	-
Valley Stream School District NY	Willow Stream Elementary School	116	1	Faculty Room Kitchen 45	1424T8-28	LT24	1	1	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	8	4,001	0.04	0.02	0.02	172	84	88
Valley Stream School District NY	Willow Stream Elementary School	117	1	Faculty Storage 46	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps		120	TRUE	7	851	0.03	0.02	0.02	29	14	15
Valley Stream School District NY	Willow Stream Elementary School	118	1	Classroom 23	1424T8-28	LT24	16	16	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.69	0.34	0.35	1,205	589	617
Valley Stream School District NY	Willow Stream Elementary School	119	1	Classroom 23 Bath	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	25	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Willow Stream Elementary School	120	1	Classroom 23 Storage	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps		120	TRUE	7	851	0.03	0.02	0.02	29	14	15
Valley Stream School District NY	Willow Stream Elementary School	121	1	Classroom K1	1424T8-28	LT24	16	16	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	40	120	TRUE	125	1,752	0.69	0.34	0.35	1,205	589	617
Valley Stream School District NY	Willow Stream Elementary School	122	1	Classroom K1 Bath	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	25	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Willow Stream Elementary School	123	1	Classroom K1 Storage	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps		120	TRUE	7	851	0.03	0.02	0.02	29	14	15
Valley Stream School District NY	Willow Stream Elementary School	124	1	Classroom K3	1424T8-28	LT24	24	24	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	60	120	TRUE	125	1,752	1.03	0.50	0.53	1,808	883	925
Valley Stream School District NY	Willow Stream Elementary School	125	1	Classroom K3 Bath	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	25	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Willow Stream Elementary School	126	1	Classroom K3 Storage	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps		120	TRUE	7	851	0.03	0.02	0.02	29	14	15
Valley Stream School District NY	Willow Stream Elementary School	127	1	Classroom K5	1424T8-28	LT24	24	24	0.0430	0.0210	1x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	60	120	TRUE	125	1,752	1.03	0.50	0.53	1,808	883	925
Valley Stream School District NY	Willow Stream Elementary School	128	1	Classroom K5 Bath	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	25	120	TRUE	15	4,001	0.03	0.02	0.02	136	64	72
Valley Stream School District NY	Willow Stream Elementary School	129	1	Classroom K5 Storage	1222T8	LT22	1	1	0.0340	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps		120	TRUE	7	851	0.03	0.02	0.02	29	14	15
Valley Stream School District NY	Willow Stream Elementary School	130	1	Hallway K5 To Cafeteria	1414T8-28	LT14	10	10	0.0220	0.0105	1x4, 1-Lamp T8, 28w	LED Int. Driver Lamp, (1) 4' Lamp	12	120	TRUE	12	4,001	0.22	0.11	0.12	880	420	460
Valley Stream School District NY	Willow Stream Elementary School	131	1	Hallway K5 To Cafeteria	2424T8-28	LT24	17	17	0.0430	0.0210	2x4, 2-Lamp T8, 28w	LED Int. Driver Lamps, (2) 4' Lamps	20	120	TRUE	12	4,001	0.73	0.36	0.37	2,925	1,428	1,496

Exhibit G-5 - CO #1

Valley Stream UFSD 13
Exhibit G-5-2
ECM 2 - Replace Air Handling Unit

ECM DESCRIPTION

Replace existing gym AHU with state of the art new unit to improve operating efficiency. Note, new unit will be ordered with the ability to add a DX coil for cooling at a later date. Cooling not included as part of this project.

DATA / ASSUMPTIONS

Efficiency Gain with Refurbishment [%]	3.0%
Efficiency Gain with Replacement [%]	7.0%
Supply Air Temperature [°F]	85.0
Return Air Temperature [°F]	70.0
Design Cooling Temperature [°F]	92.5

*Supply CFM and OA CFM is obtained by drawings and equipment manuals

COMMISSIONING

Verify all items in refurbishment task list have been completed and unit is operating as designed

RECOVERY/SAFETY FACTOR

Electric Safety Factor [%] =	0%
Thermal Safety Factor [%] =	0%

FORMULAE

$$W_{SAVINGS} = W_{C-EXT} - W_{C-PRP}$$

$$W_{C-EXT} = \sum_{60}^{105} [((C \cdot (T_{BIN} - T_{UNOCC}) / (T_{BIN} - T_{DESIGN}) \cdot t_{UNOCC}) + (C \cdot (T_{BIN} - T_{OCC}) / (T_{BIN} - T_{DESIGN}) \cdot t_{OCC})) \cdot (12 / \eta_{EXT})]$$

$$W_{C-PRP} = \sum_{60}^{105} [((C \cdot (T_{BIN} - T_{UNOCC}) / (T_{BIN} - T_{DESIGN}) \cdot t_{UNOCC}) + (C \cdot (T_{BIN} - T_{OCC}) / (T_{BIN} - T_{DESIGN}) \cdot t_{OCC})) \cdot (12 / \eta_{PRP})]$$

$$Q_{SAVINGS} = \sum_{-15}^{60} [(Q_{INPUT} \cdot \eta_{REFURB/REPLACE}) / 100,000]$$

$$Q_{INPUT} = \sum_{-15}^{60} [(t_{OCC} \cdot Q_{LOAD}) / \eta_{BOILER}]$$

$$Q_{LOAD} = \sum_{-15}^{60} [1.08 \cdot CFM_{SUPPLY} \cdot T_{RISE}]$$

$$T_{RISE} = \sum_{-15}^{60} [T_{SUPPLY} - T_{MIXED}]$$

$$T_{MIXED} = \sum_{-15}^{60} [((CFM_{RETURN} \cdot T_{RETURN}) + (CFM_{OA} \cdot T_{BIN})) / (CFM_{SUPPLY})]$$

Valley Stream UFSD 13
 Exhibit G-5-2
 ECM 2 - Replace Air Handling Unit

Variable	Units	Description
$W_{SAVINGS}$	kWh	Electrical savings
W_{C-EXT}	kWh	Existing cooling consumption
W_{C-PRP}	kWh	Proposed cooling consumption
\sum_{60}^{105}	-	Summation of all bins from 60°F to 105°F
C	Ton	Cooling capacity
η_{EXT}	-	Existing cooling efficiency (EER)
η_{PRP}	-	Proposed cooling efficiency (EER)
T_{DESIGN}	°F	Cooling design temperature
T_{OCC}	°F	Temperature of building during occupied hours
T_{UNOCC}	°F	Temperature of building during unoccupied hours
t_{UNOCC}	Hrs	Unoccupied Bin Hours in respective temperature bin
$Q_{SAVINGS}$	Therms	Thermal Savings
\sum_{-15}^{60}	-	Summation of all bins from -15°F to 60°F
η_{BOILER}	%	Efficiency of boiler
T_{BIN}	°F	Temperature of respective bin
Q_{INPUT}	BTU	Input heat provided by unit at respective bin temperature
Q_{LOAD}	BTU/hr	Heat load on the unit
T_{RISE}	°F	Temperature rise across the coil
T_{MIXED}	°F	Mixed air temperature
T_{SUPPLY}	°F	Temperature of supply air
T_{RETURN}	°F	Temperature of return air
CFM_{SUPPLY}	CFM	Total supply air CFM
CFM_{OA}	CFM	Total outside air CFM
CFM_{RETURN}	CFM	Total return air CFM
$\eta_{REFURB/REPLACE}$	%	Efficiency improvement from refurbishment OR replacement
t_{OCC}	Hrs	Occupied bin hours in respective temperature bin

Exhibit G-5 - CO #1

Valley Stream UFSD 13
 Exhibit G-5-2
 ECM 2 - Replace Air Handling Unit

*Inputs are blue

Building	Location Served	Qty (Refurbished)	Qty (Replaced)	Total Supply [CFM]	Total OA [CFM]	Proposed Boiler Efficiency [%]	Total Cooling Capacity [Tons]	Existing Cooling EER	Proposed Cooling EER
Howell Road ES	Gym	-	1	12,000	3,600	80.0%	-	-	-
Totals		-	1	12,000	3,600		-		

	Howell Road ES
No. of Units to be Refurbished	-
No. of Units to be Replaced	1
Total Supply Air [CFM]	12,000
Total Outdoor Air [CFM]	3,600
Total Return Air [CFM]	8,400
Efficiency Gain w/ Refurbished and Replaced Units [%]	7.0%
Return Air Temperature [°F]	70.0
Supply Air Temperature [°F]	85.0
Proposed Boiler Efficiency [%]	80.0%
Occ. Cooling Setpoint [°F]	74.0
Unocc. Cooling Setpoint [°F]	85.0
Annual Electric Savings [kWh]	-
Annual Thermal Savings [Therms]	247
Electric Safety Factor [%]	0%
Thermal Safety Factor [%]	0%
Annual Electric Savings [kWh]	-
Annual Thermal Savings [Therms]	247

Exhibit G-5 - CO #1

Valley Stream UFSD 13
 Exhibit G-5-2
 ECM 2 - Replace Air Handling Unit

CALCULATIONS

HOWELL ROAD ES

Gym

Amb. Temp Bin [°F]	Avg Temp [°F]	01-08 Hours	09-16 Hours	17-24 Hours	Total Bin Hours	Occup. Bin Hours	Mixed Air Temp [°F]	Temp Rise Across Coil [°F]	Heat Load on the Unit [BTUh]	Heat Provided by Units [BTU]	Input Heat to Units [BTU]	Savings by Refurb/Replace [Therms]
HEATING												
55 to 60	57.5	60	127	96	283	88	66.3	18.8	243,000	21,316,741	26,645,926	18.7
50 to 55	52.5	110	178	125	413	124	64.8	20.3	262,440	32,570,679	40,713,348	28.5
45 to 50	47.5	108	164	121	393	115	63.3	21.8	281,880	32,315,529	40,394,411	28.3
40 to 45	42.5	240	251	280	771	179	61.8	23.3	301,320	53,874,402	67,343,002	47.1
35 to 40	37.5	355	282	362	999	205	60.3	24.8	320,760	65,655,562	82,069,453	57.4
30 to 35	32.5	239	120	167	526	91	58.8	26.3	340,200	30,967,312	38,709,141	27.1
25 to 30	27.5	109	76	81	266	56	57.3	27.8	359,640	20,053,141	25,066,426	17.5
20 to 25	22.5	100	51	72	223	39	55.8	29.3	379,080	14,638,580	18,298,225	12.8
15 to 20	17.5	58	29	25	112	22	54.3	30.8	398,520	8,770,998	10,963,748	7.7
10 to 15	12.5	10	5	6	21	4	52.8	32.3	417,960	1,586,009	1,982,511	1.4
5 to 10	7.5	8	-	1	9	0	51.3	33.8	437,400	156,214	195,268	0.1
0 to 5	2.5	-	-	-	-	-	49.8	35.3	456,840	-	-	-
-5 to 0	-2.5	-	-	-	-	-	48.3	36.8	476,280	-	-	-
-10 to -5	-7.5	-	-	-	-	-	46.8	38.3	495,720	-	-	-
-15 to -10	-12.5	-	-	-	-	-	45.3	39.8	515,160	-	-	-
Total		1,397	1,283	1,336	4,016	922						246.7

SAVINGS SUMMARY

Building ID	kWh Savings	kW Savings	Thermal Savings	Electric Safety Factor	Thermal Safety Factor
	kWh	kW	Therms	%	%
Howell Road ES	-	-	247	0.0%	0.0%
James A. Dever ES	-	-	-	0.0%	0.0%
Wheeler Avenue ES	-	-	-	0.0%	0.0%
Willow Road ES	-	-	-	0.0%	0.0%
Subtotal	-	-	247	-	-

Exhibit G-5 - CO #1

**Valley Stream UFSD 13
Exhibit G-5 Chart
Domestic Hot Water Chart**

*Inputs are blue

**If Domestic Hot Water is fed off boiler put "Y" in Column F and put the respective boiler equipment label in Column C

EXISTING												
Building	Equipment Label	Qty	Location	Fed Off Boiler (Y/N)	Replace DHW (Y/N)	Fuel	Manufacturer	Model No.	Capacity [MBH]	Capacity (Gal)	Combustion Efficiency [%]	Percentage of Building DHW Load
James A. Dever ES	JADES DHW 1	1	Boiler Room	N	Y	Natural Gas	State	SBD65251NE	251	65	80%	100%
Totals		1							251			

PROPOSED						
Building	Qty	Fuel	Manufacturer	Model No.	Capacity [MBH]	Combustion Efficiency [%]
James A. Dever ES	1	Natural Gas	AO Smith	BTH-250A	250	92.0%
	1				250	

EXISTING DHW EFFICIENCY

James A. Dever ES	
Building	James A. Dever ES
Label	JADES DHW 1
Quantity	1
Location	Boiler Room
Fuel Type	Natural Gas
Capacity (MBTU)	251
Percentage of Building Load	100%
Current Efficiency	80.0%

PROPOSED DHW EFFICIENCY

James A. Dever ES	
DHW Replacement	Y
Isolate Storage Tank	N
Label	JADES DHW 1
Fuel Type	Natural Gas
Quantity	1
Location	Boiler Room
Capacity (MBTU)	250
Proposed Efficiency	92.0%

Valley Stream UFSD 13
Exhibit G-5-3
ECM 3 - Replace Domestic Hot Water Heater

ECM DESCRIPTION

Existing domestic hot water heaters will be replaced with high efficiency condensing equivalents.

DATA / ASSUMPTIONS

Current DHW Heater Efficiency 80.0%

COMMISSIONING

Verify all equipment is installed properly and working as designed

RECOVERY/SAFETY FACTOR

Thermal Safety Factor [%] = 0%

DHW REPLACEMENT CALCULATION

$$Q_{\text{savings}} = \text{Fuel}_{\text{DHW}} - ((\text{Fuel}_{\text{DHW}} \cdot \eta_{\text{OLD}}) / (\eta_{\text{NEW}}))$$

$$S_{\text{TOT}} = (F_{\text{ADJ-FO}} * C_{\text{FO}}) - (F_{\text{ADJ-NG}} * C_{\text{NG}})$$

Variable	Units	Description
Q_{savings}	Therms	Thermal Savings
η_{NEW}	%	Efficiency of Proposed DHW Heater
η_{OLD}	%	Efficiency of Existing DHW Heater
Fuel_{DHW}	Therms	Annual DHW Fuel Consumption
$F_{\text{ADJ-FO}}$	Gallons	Adjusted Boiler Usage in Gallons (Fuel Oil)
$F_{\text{ADJ-NG}}$	Therms	Adjusted Boiler Usage in Therms (Natural Gas)
C_{FO}	\$/Gallon	Existing Cost of Fuel Oil
C_{NG}	\$/Therm	Proposed Cost of Natural Gas
S_{TOT}	\$	Fuel Conversion Savings

*Inputs are blue

Building	Label	DHW Quantity	Indirect DHW HEX Quantity
James A. Dever ES	JADES DHW 1	1	-
Totals		1	-

Valley Stream UFSD 13
 Exhibit G-5-3
 ECM 3 - Replace Domestic Hot Water Heater

A. REPLACE EXISTING DOMESTIC HOT WATER HEATERS

James A. Dever ES	
Label	JADES DHW 1
Quantity	1
Fuel Switch	N
Existing Fuel	Natural Gas
Proposed Fuel	Natural Gas
Current DHW System Efficiency [%]	80.0%
Proposed DHW System Efficiency [%]	92.0%
Improvement DHW System Efficiency [%]	12.0%
Annual DHW Heater Baseline [Therms]	2,481
Percentage of DHW Building Load [%]	100%
Safety Factor	0%
Thermal Savings [Therms]	324

SAVINGS SUMMARY

Building ID	kWh Savings	kW Savings	Thermal Savings	Fuel Switch Savings	Thermal Safety Factor	Electric Safety Factor
	kWh	kW	Therms	\$	%	%
Howell Road ES	-	-	-	\$ -	0.0%	0.0%
James A. Dever ES	-	-	324	\$ -	0.0%	0.0%
Wheeler Avenue ES	-	-	-	\$ -	0.0%	0.0%
Willow Road ES	-	-	-	\$ -	0.0%	0.0%
Subtotal	-	-	324	-		

Exhibit G-5 - CO #1

Valley Stream UFSD 13
 Exhibit G-5 Chart
 Variable Frequency Drives and Motor Table

VARIABLE FREQUENCY DRIVE AND MOTOR TABLE

*Inputs are blue

VARIABLE FREQUENCY DRIVE AND MOTOR TABLE							
Building	Equipment Label	Equipment Configuration	Qty	Total Horsepower [HP]*	Existing Efficiency [%]	Replace Motor (Y/N)	Install VFD (Y/N)
Wheeler Avenue ES	WAES HW Pump 1	Operating / Standby	1	3.0	80.0%	Y	N
Wheeler Avenue ES	WAES HW Pump 2	Operating / Standby	1	3.0	87.5%	Y	N
Totals			2	6.0			

	Wheeler Avenue ES	Wheeler Avenue ES
Equipment Label	WAES HW Pump 1	WAES HW Pump 2
Equipment Configuration	Operating / Standby	Operating / Standby
Quantity	1	1
Horsepower [HP]	3.0	3.0
Existing Efficiency [%]	80.0%	87.5%
Replace Motor	Y	Y
Install VFD	N	N

Exhibit G-5 - CO #1

Valley Stream UFSD 13

Exhibit G-5-4

ECM 4 - Replace Pumps and Pump Motors

ECM DESCRIPTION

The existing pumps at Wheeler Avenue ES are past their useful lives and in need of replacement. In addition, the existing motors are standard efficiency and would benefit from an upgrade to NEMA high efficiency standards.

DATA / ASSUMPTIONS

Motor Load Factor [%]

65%

*Run hours are based on the audit and through interviews with facility staff

COMMISSIONING

Review installation documents for alignments and vibrations and provide equipment start up.

RECOVERY/SAFETY FACTOR

Electric Safety Factor [%] =

0%

FORMULAE

MOTOR

$$W_{\text{MotorSavings}} = W_{\text{EXISTING}} - W_{\text{PROPOSED}}$$

$$W_{\text{EXISTING}} = (\text{HP} \cdot 0.746) \cdot \text{Lf} / \eta_{\text{EXISTING}} \cdot t_{\text{EXISTING}}$$

$$W_{\text{PROPOSED}} = (\text{HP} \cdot 0.746) \cdot \text{Lf} / \eta_{\text{PROPOSED}} \cdot t_{\text{PROPOSED}}$$

Variable	Units	Description
$W_{\text{MotorSavings}}$	kWh	Electrical Savings for Motor Replacement
HP	HP	Horsepower of motor
t_{EXISTING}	Hrs	Existing Run Hours
t_{PROPOSED}	Hrs	Proposed Run Hours
Lf	%	Load Factor of motor
η_{EXISTING}	%	Existing efficiency of motor
η_{PROPOSED}	%	Proposed efficiency of motor
W_{EXISTING}	kWh	Existing electrical consumption of motor
W_{PROPOSED}	kWh	Proposed electrical consumption of motor

Exhibit G-5 - CO #1

Valley Stream UFSD 13

Exhibit G-5-4

ECM 4 - Replace Pumps and Pump Motors

ASSUMPTIONS / INPUTS

* Inputs are in blue

Building	Equipment Label	Configuration	Qty	Horsepower [HP]	Existing Efficiency [%]	Replace Motor	Install VFD
Wheeler Avenue ES	WAES HW Pump 1	Operating / Standby	1	3.0	80.0%	Y	N
Wheeler Avenue ES	WAES HW Pump 2	Operating / Standby	1	3.0	87.5%	Y	N
Total							

CALCULATIONS (MOTOR)

	Wheeler Avenue ES	Wheeler Avenue ES
Equipment Label	WAES HW Pump 1	WAES HW Pump 2
Equipment Configuration	Operating / Standby	Operating / Standby
Replace Motor	Y	Y
Install VFD	N	N
Quantity	1	1
Horsepower [HP]	3.0	3.0
Proposed Run Hours [Hrs]	2,008	2,008
Load Factor [%]	65.0%	65.0%
Existing Motor Efficiency [%]	80.0%	87.5%
Proposed Motor Efficiency [%]	89.5%	89.5%
Existing kW [kW]	1.82	1.66
Proposed kW [kW]	1.63	1.63
Existing Motor kWh Consumption [kWh]	3,651	3,338
Proposed Motor kWh Consumption w/o VFD [kWh]	3,264	3,264
Proposed Motor kWh Consumption w/ VFD [kWh]	-	-
Electric Safety Factor [%]	0%	0%
kW Savings [kW]	0.19	0.04
kWh Savings [kWh]	388	75

SAVINGS SUMMARY

Building ID	kWh Savings	kW Savings	Electric Safety Factor
	kWh	kW	%
Howell Road ES	-	-	0.0%
James A. Dever ES	-	-	0.0%
Wheeler Avenue ES	462	0.23	0.0%
Willow Road ES	-	-	0.0%
Subtotal	462	0.23	

Valley Stream UFSD 13
 Exhibit G-5-5
 ECM 5 - Install Pipe Insulation
 Piping Insulation - Summary

CALCULATION SUMMARY

	Wheeler Avenue ES
Include Heating Hot Water Pipe Insulation Savings	Y
Heating Hot Water Pipe Insulation Savings [Therms]	915
Include Steam Pipe Insulation Savings	Y
Steam Pipe Insulation Savings [Therms]	22
Safety Factor [%]	0%
Total Thermal Savings [Therms]	937

SAVINGS SUMMARY

Building ID	Thermal Savings Therms	Thermal Safety Factor %
Howell Road ES	-	0.0%
James A. Dever ES	-	0.0%
Wheeler Avenue ES	937	0.0%
Willow Road ES	-	0.0%
Subtotal	937	

Exhibit G-5 - CO #1

Valley Stream UFSD 13
Exhibit G-5-5
ECM 5 - Install Pipe Insulation
Heating Hot Water Piping Insulation

ECM DESCRIPTION

Insulate bare heating hot water piping located in boiler rooms and in transition areas. Insulate tank shells where applicable.

DATA / ASSUMPTIONS

Run Hours 4,016
 * New Pipe Insulation Thermal Conductivity (k-Factor) 0.27 BTU/ft²·°F·hr
 * Proposed boiler efficiencies are used for each building

COMMISSIONING

Visual inspection per scope of work from subcontractor.

RECOVERY/SAFETY FACTOR

Thermal Safety Factor [%] = Various

FORMULAE

$$T_{SAVE} = ((q_{CONV-BARE} + q_{RAD-BARE}) - (q_{CONV-INS} + q_{RAD-INS})) \cdot t / 100,000$$

Convection Analysis

$$q_{CONV-INS} = h_{C-INS} \cdot (\pi \cdot D_{INS} \cdot L_{PIPE}) \cdot (T_{INS} - T_{AMB})$$

$$q_{CONV-BARE} = h_{C-BARE} \cdot (\pi \cdot D_{BARE} \cdot L_{PIPE}) \cdot (T_{BARE} - T_{AMB})$$

$$h_{C-INS} = 0.27 \cdot ((T_{FILM-INS} - T_{AMB}) / D_{INS})^{0.25}$$

$$h_{C-BARE} = 0.27 \cdot ((T_{BARE} - T_{AMB}) / D_{BARE})^{0.25}$$

$$T_{FILM-INS} = (T_{INS} + T_{AMB}) / 2$$

$$T_{FILM-BARE} = (T_{BARE} + T_{AMB}) / 2$$

Iterative Insulation Surface Temp Analysis

$$q_{ITER} = [(T_{BARE} - T_{AMB}) \cdot 2 \cdot \pi] / [\ln(D_{INS} / D_{BARE}) \cdot (1 / k) + (1 / (D_{INS} / 2 \cdot h_{INT}))]$$

$$T_{INS} = T_{BARE} - q_{ITER} \cdot \ln(D_{INS} / D_{BARE}) \cdot (1 / (2 \cdot \pi \cdot k))$$

$$h_{ITER} = 0.27 \cdot (T_{INS} - T_{AMB}) / D_{INS}^{0.25}$$

Radiation Analysis

$$q_{RAD-INS} = \sigma \cdot \epsilon_{INS} \cdot (\pi \cdot D_{INS} \cdot L_{PIPE}) \cdot ((T_{INS} + 460)^4 - (T_{SURR} + 460)^4)$$

$$q_{RAD-BARE} = \sigma \cdot \epsilon_{BARE} \cdot (\pi \cdot D_{BARE} \cdot L_{PIPE}) \cdot ((T_{BARE} + 460)^4 - (T_{SURR} + 460)^4)$$

$$T_{SURR} = (T_{FLOOR} + T_{CEILING} + 2 \cdot T_{WALL}) / 4$$

Exhibit G-5 - CO #1

Valley Stream UFSD 13
 Exhibit G-5-5
 ECM 5 - Install Pipe Insulation
 Heating Hot Water Piping Insulation

Variable	Units	Description
T_{SAVE}	Therms	Total thermal savings
$q_{CONV-INS}$	BTU/hr	Convective heat loss from insulated pipe
$q_{CONV-BARE}$	BTU/hr	Convective heat loss from bare pipe
h_{C-INS}	BTU/hr-ft ² -°F	Natural convective insulated pipe heat transfer film coefficient
h_{C-BARE}	BTU/hr-ft ² -°F	Natural convective bare pipe heat transfer film coefficient
$T_{FILM-INS}$	°F	Average film temperature of insulated pipe
$T_{FILM-BARE}$	°F	Average film temperature of bare pipe
k	BTU/hr-ft-°F	Thermal conductivity of pipe insulation
q_{ITER}	BTU/hr	Iterative heat loss
h_{ITER}	BTU/hr-ft ² -°F	Iterative natural convection heat transfer film coefficient
h_{INT}	BTU/hr-ft ² -°F	Initial natural convection heat transfer film coefficient (for iterations)
t	hr	Duration of the heating season
$q_{RAD-INS}$	BTU/hr	Net radiation heat loss from insulated pipe
$q_{RAD-BARE}$	BTU/hr	Net radiation heat loss from bare pipe
σ	BTU/hr-ft ² -°R ⁴	Stefan-Boltzman constant (0.1713×10^{-8})
ϵ_{INS}	-	Emissivity of insulated pipe
ϵ_{BARE}	-	Emissivity of bare pipe
A_{INS}	ft ²	Surface area of insulated pipe
A_{BARE}	ft ²	Surface area of bare pipe
L_{PIPE}	ft	Pipe length
D_{INS}	ft	Diameter of insulated pipe
D_{BARE}	ft	Diameter of bare pipe
T_{AMB}	°F	Ambient air temperature
T_{INS}	°F	Surface temperature of insulated pipe
T_{BARE}	°F	Surface temperature of bare pipe
T_{SURR}	°F	Average Surrounding temperature
T_{FLOOR}	°F	Surrounding floor temperature
$T_{CEILING}$	°F	Surrounding ceiling temperature
T_{WALL}	°F	Surrounding wall temperature

Exhibit G-5 - CO #1

Valley Stream UFSD 13
 Exhibit G-5-5
 ECM 5 - Install Pipe Insulation
 Heating Hot Water Piping Insulation

CALCULATIONS

* Inputs are in blue

Subcontractor Calculations * If Yes - Please Refer to tab 'Sub Pipe Insulation' for details

Linear Feet of Pipe [ft] per Pipe Diameter Size [in]

Building	14"+ Diameter	10" Diameter	8" Diameter	6" Diameter	5" Diameter	4" Diameter	3" Diameter	2.5" Diameter	2" Diameter	1.5" Diameter	1" Diameter	0.75" Diameter	0.5" Diameter
Wheeler Avenue ES	-	-	-	-	-	49.2	52.6	-	-	-	-	-	-
Totals	-	-	-	-	-	49.2	52.6	-	-	-	-	-	-

	Wheeler Avenue ES
Total Linear Feet of Insulation [ft]	101.8
Losses from Bare Pipe [BTU/hr]	27,488
Losses from Insulated Pipe [BTU/hr]	9,594
Proposed Boiler Efficiency [%]	78.5%
Thermal Savings [Therms/hr]	0.23
Safety Factor [%]	0%
Thermal Savings [Therms]	915

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Nominal Pipe Size [in]	14.00	10.00	8.00	6.00	5.00	4.00	3.00	2.50	2.00	1.50	1.00	0.75	0.50
Contact Temp. of Bare Pipe (Baseline) [°F]	180	180	180	180	180	180	180	180	180	180	180	180	180
Thickness of Insulation [in]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.5	1.5	1.5	1.5
Insulation Thermal Conductivity (k-Factor) [BTU/ft ² ·°F·hr]	0.270	0.270	0.270	0.270	0.270	0.270	0.270	0.270	0.270	0.270	0.270	0.270	0.270
Pipe Length [ft]	1	1	1	1	1	1	1	1	1	1	1	1	1
Hours of Operation [hr]	4,016	4,016	4,016	4,016	4,016	4,016	4,016	4,016	4,016	4,016	4,016	4,016	4,016
Environment Temp [°F]	70	70	70	70	70	70	70	70	70	70	70	70	70
Contact Temp of Floor [°F]	60	60	60	60	60	60	60	60	60	60	60	60	60
Contact Temp of Ceiling [°F]	90	90	90	90	90	90	90	90	90	90	90	90	90
Contact Temp of Walls [°F]	75	75	75	75	75	75	75	75	75	75	75	75	75
Initial Insulation Film Coefficient Estimate [BTU/hr·ft ² ·°F]	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65
Emissivity of Bare Pipe	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Emissivity of Insulated Pipe	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Outside Diameter of Bare Pipe [in]	14.000	10.750	8.625	6.625	5.563	4.500	3.500	2.875	2.375	1.900	1.315	1.050	0.840
Outside Diameter of Insulated Pipe [in]	18.000	14.750	12.625	10.625	9.563	8.500	7.500	6.875	6.375	4.900	4.315	4.050	3.840
Characteristic Length of Bare Pipe [ft]	1.167	0.896	0.719	0.552	0.464	0.375	0.292	0.240	0.198	0.158	0.110	0.088	0.070
Characteristic Length of Insulated Pipe [ft]	1.500	1.229	1.052	0.885	0.797	0.708	0.625	0.573	0.531	0.408	0.360	0.338	0.320
Average Film Temp. of Bare Pipe [°F]	125.0	125.0	125.0	125.0	125.0	125.0	125.0	125.0	125.0	125.0	125.0	125.0	125.0
Average Film Temp. of Insulated Pipe [°F]	107	106	105	104	103	102	101	101	100	103	101	100	99
Film Coefficient of Bare Pipe [BTU/hr·ft ² ·°F]	0.841	0.899	0.950	1.014	1.060	1.117	1.190	1.250	1.311	1.386	1.520	1.608	1.700
Film Coefficient of Insulated Pipe [BTU/hr·ft ² ·°F]	0.60	0.63	0.65	0.67	0.69	0.70	0.72	0.73	0.74	0.81	0.82	0.83	0.83
Convective Losses for Bare Pipe [BTU/hr-ft]	339.21	278.24	235.97	193.61	169.83	144.86	119.98	103.52	89.70	75.88	57.58	48.63	41.14
Convective Losses for Insulated Pipe [BTU/hr-ft]	155.65	133.21	117.87	102.81	94.52	85.96	77.61	72.21	67.77	56.94	51.12	48.36	46.09
Radiant Losses of Bare Pipe [BTU/hr-ft]	485	372	299	230	193	156	121	100	82	66	46	36	29
Radiant Losses of Insulated Pipe [BTU/hr-ft]	28	23	20	17	15	13	12	11	10	8	7	6	6
Total Losses of Bare Pipe [BTU/hr-ft]	824	651	535	423	363	301	241	203	172	142	103	85	70
Total Losses of Insulated Pipe [BTU/hr-ft]	184	156	138	120	110	99	89	83	78	65	58	55	52

INSULATION SURFACE TEMP. CALCULATION 14.0 inch pipe		1st Iteration Heat Loss [BTU/hr]	397
		1st Iteration Insulation Surface Temp. [°F]	121
		1st Iteration Film Coefficient [BTU/hr·ft ² ·°F]	0.652
		2nd Iteration Heat Loss [BTU/hr]	232
NPS Pipe Size [in]	14.00	2nd Iteration Insulation Surface Temp. [°F]	146
Bare Pipe Surface Temp. [°F]	180	2nd Iteration Film Coefficient [BTU/hr·ft ² ·°F]	0.719
Initial Film Coefficient [BTU/hr·ft ² ·°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	248
Insulation Thickness [in]	2.0	3rd Iteration Insulation Surface Temp. [°F]	143
Insulation k-Factor [BTU/hr·ft ² ·°F]	0.270	3rd Iteration Film Coefficient [BTU/hr·ft ² ·°F]	0.714
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	247
External Pipe Diameter [in]	14.00	4th Iteration Insulation Surface Temp. [°F]	143
Insulation Surface Temp [°F]	143	4th Iteration Film Coefficient [BTU/hr·ft ² ·°F]	0.714

INSULATION SURFACE TEMP. CALCULATION 2.5 inch pipe		1st Iteration Heat Loss [BTU/hr]	129
		1st Iteration Insulation Surface Temp. [°F]	114
		1st Iteration Film Coefficient [BTU/hr·ft ² ·°F]	0.797
		2nd Iteration Heat Loss [BTU/hr]	91
NPS Pipe Size [in]	2.50	2nd Iteration Insulation Surface Temp. [°F]	133
Bare Pipe Surface Temp. [°F]	180	2nd Iteration Film Coefficient [BTU/hr·ft ² ·°F]	0.875
Initial Film Coefficient [BTU/hr·ft ² ·°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	96
Insulation Thickness [in]	2.0	3rd Iteration Insulation Surface Temp. [°F]	131
Insulation k-Factor [BTU/hr·ft ² ·°F]	0.270	3rd Iteration Film Coefficient [BTU/hr·ft ² ·°F]	0.867
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	95
External Pipe Diameter [in]	2.875	4th Iteration Insulation Surface Temp. [°F]	131
Insulation Surface Temp [°F]	131	4th Iteration Film Coefficient [BTU/hr·ft ² ·°F]	0.868

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INSULATION SURFACE TEMP. CALCULATION		10.0 inch pipe	
		1st Iteration Heat Loss [BTU/hr]	320
		1st Iteration Insulation Surface Temp. [°F]	120
		1st Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.683
		2nd Iteration Heat Loss [BTU/hr]	195
NPS Pipe Size [in]	10.00	2nd Iteration Insulation Surface Temp. [°F]	144
Bare Pipe Surface Temp. [°F]	180	2nd Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.751
Initial Film Coefficient [BTU/hr-ft ² -°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	207
Insulation Thickness [in]	2.0	3rd Iteration Insulation Surface Temp. [°F]	141
Insulation k-Factor [BTU/hr-ft ² -°F]	0.270	3rd Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.745
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	206
External Pipe Diameter [in]	10.75	4th Iteration Insulation Surface Temp. [°F]	142
Insulation Surface Temp [°F]	142	4th Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.746

INSULATION SURFACE TEMP. CALCULATION		8.0 inch pipe	
		1st Iteration Heat Loss [BTU/hr]	270
		1st Iteration Insulation Surface Temp. [°F]	119
		1st Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.707
		2nd Iteration Heat Loss [BTU/hr]	169
NPS Pipe Size [in]	8.00	2nd Iteration Insulation Surface Temp. [°F]	142
Bare Pipe Surface Temp. [°F]	180	2nd Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.777
Initial Film Coefficient [BTU/hr-ft ² -°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	179
Insulation Thickness [in]	2.0	3rd Iteration Insulation Surface Temp. [°F]	140
Insulation k-Factor [BTU/hr-ft ² -°F]	0.270	3rd Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.770
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	178
External Pipe Diameter [in]	8.625	4th Iteration Insulation Surface Temp. [°F]	140
Insulation Surface Temp [°F]	140	4th Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.771

INSULATION SURFACE TEMP. CALCULATION		6.0 inch pipe	
		1st Iteration Heat Loss [BTU/hr]	222
		1st Iteration Insulation Surface Temp. [°F]	118
		1st Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.734
		2nd Iteration Heat Loss [BTU/hr]	143
NPS Pipe Size [in]	6.00	2nd Iteration Insulation Surface Temp. [°F]	140
Bare Pipe Surface Temp. [°F]	180	2nd Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.806
Initial Film Coefficient [BTU/hr-ft ² -°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	152
Insulation Thickness [in]	2.0	3rd Iteration Insulation Surface Temp. [°F]	138
Insulation k-Factor [BTU/hr-ft ² -°F]	0.270	3rd Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.799
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	151
External Pipe Diameter [in]	6.625	4th Iteration Insulation Surface Temp. [°F]	138
Insulation Surface Temp [°F]	138	4th Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.799

INSULATION SURFACE TEMP. CALCULATION		2.0 inch pipe	
		1st Iteration Heat Loss [BTU/hr]	116
		1st Iteration Insulation Surface Temp. [°F]	112
		1st Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.806
		2nd Iteration Heat Loss [BTU/hr]	83
NPS Pipe Size [in]	2.00	2nd Iteration Insulation Surface Temp. [°F]	132
Bare Pipe Surface Temp. [°F]	180	2nd Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.886
Initial Film Coefficient [BTU/hr-ft ² -°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	87
Insulation Thickness [in]	2.0	3rd Iteration Insulation Surface Temp. [°F]	129
Insulation k-Factor [BTU/hr-ft ² -°F]	0.270	3rd Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.877
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	87
External Pipe Diameter [in]	2.375	4th Iteration Insulation Surface Temp. [°F]	129
Insulation Surface Temp [°F]	129	4th Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.878

INSULATION SURFACE TEMP. CALCULATION		1.5 inch pipe	
		1st Iteration Heat Loss [BTU/hr]	107
		1st Iteration Insulation Surface Temp. [°F]	120
		1st Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.900
		2nd Iteration Heat Loss [BTU/hr]	77
NPS Pipe Size [in]	1.50	2nd Iteration Insulation Surface Temp. [°F]	137
Bare Pipe Surface Temp. [°F]	180	2nd Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.966
Initial Film Coefficient [BTU/hr-ft ² -°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	81
Insulation Thickness [in]	1.5	3rd Iteration Insulation Surface Temp. [°F]	135
Insulation k-Factor [BTU/hr-ft ² -°F]	0.270	3rd Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.959
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	80
External Pipe Diameter [in]	1.9	4th Iteration Insulation Surface Temp. [°F]	135
Insulation Surface Temp [°F]	135	4th Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.960

INSULATION SURFACE TEMP. CALCULATION		1.0 inch pipe	
		1st Iteration Heat Loss [BTU/hr]	89
		1st Iteration Insulation Surface Temp. [°F]	118
		1st Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.916
		2nd Iteration Heat Loss [BTU/hr]	66
NPS Pipe Size [in]	1.00	2nd Iteration Insulation Surface Temp. [°F]	134
Bare Pipe Surface Temp. [°F]	180	2nd Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.985
Initial Film Coefficient [BTU/hr-ft ² -°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	69
Insulation Thickness [in]	1.5	3rd Iteration Insulation Surface Temp. [°F]	132
Insulation k-Factor [BTU/hr-ft ² -°F]	0.270	3rd Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.978
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	69
External Pipe Diameter [in]	1.315	4th Iteration Insulation Surface Temp. [°F]	132
Insulation Surface Temp [°F]	132	4th Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.978

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INSULATION SURFACE TEMP. CALCULATION		5.0 inch pipe	
		1st Iteration Heat Loss [BTU/hr]	196
		1st Iteration Insulation Surface Temp. [°F]	117
		1st Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.750
		2nd Iteration Heat Loss [BTU/hr]	129
NPS Pipe Size [in]	5.00	2nd Iteration Insulation Surface Temp. [°F]	139
Bare Pipe Surface Temp. [°F]	180	2nd Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.823
Initial Film Coefficient [BTU/hr-ft ² -°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	137
Insulation Thickness [in]	2.0	3rd Iteration Insulation Surface Temp. [°F]	136
Insulation k-Factor [BTU/hr-ft ² -°F]	0.270	3rd Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.816
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	136
External Pipe Diameter [in]	5.563	4th Iteration Insulation Surface Temp. [°F]	137
Insulation Surface Temp [°F]	137	4th Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.816

INSULATION SURFACE TEMP. CALCULATION		0.75 inch pipe	
		1st Iteration Heat Loss [BTU/hr]	80
		1st Iteration Insulation Surface Temp. [°F]	116
		1st Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.922
		2nd Iteration Heat Loss [BTU/hr]	61
NPS Pipe Size [in]	0.75	2nd Iteration Insulation Surface Temp. [°F]	132
Bare Pipe Surface Temp. [°F]	180	2nd Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.993
Initial Film Coefficient [BTU/hr-ft ² -°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	63
Insulation Thickness [in]	1.5	3rd Iteration Insulation Surface Temp. [°F]	130
Insulation k-Factor [BTU/hr-ft ² -°F]	0.270	3rd Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.985
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	63
External Pipe Diameter [in]	1.05	4th Iteration Insulation Surface Temp. [°F]	130
Insulation Surface Temp [°F]	130	4th Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.986

INSULATION SURFACE TEMP. CALCULATION		4.0 inch pipe	
		1st Iteration Heat Loss [BTU/hr]	170
		1st Iteration Insulation Surface Temp. [°F]	116
		1st Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.768
		2nd Iteration Heat Loss [BTU/hr]	115
NPS Pipe Size [in]	4.00	2nd Iteration Insulation Surface Temp. [°F]	137
Bare Pipe Surface Temp. [°F]	180	2nd Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.842
Initial Film Coefficient [BTU/hr-ft ² -°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	121
Insulation Thickness [in]	2.0	3rd Iteration Insulation Surface Temp. [°F]	135
Insulation k-Factor [BTU/hr-ft ² -°F]	0.270	3rd Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.834
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	120
External Pipe Diameter [in]	4.5	4th Iteration Insulation Surface Temp. [°F]	135
Insulation Surface Temp [°F]	135	4th Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.835

INSULATION SURFACE TEMP. CALCULATION		0.5 inch pipe	
		1st Iteration Heat Loss [BTU/hr]	73
		1st Iteration Insulation Surface Temp. [°F]	114
		1st Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.926
		2nd Iteration Heat Loss [BTU/hr]	56
NPS Pipe Size [in]	0.50	2nd Iteration Insulation Surface Temp. [°F]	130
Bare Pipe Surface Temp. [°F]	180	2nd Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.999
Initial Film Coefficient [BTU/hr-ft ² -°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	58
Insulation Thickness [in]	1.5	3rd Iteration Insulation Surface Temp. [°F]	128
Insulation k-Factor [BTU/hr-ft ² -°F]	0.270	3rd Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.990
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	58
External Pipe Diameter [in]	0.84	4th Iteration Insulation Surface Temp. [°F]	128
Insulation Surface Temp [°F]	128	4th Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.991

INSULATION SURFACE TEMP. CALCULATION		3.0 inch pipe	
		1st Iteration Heat Loss [BTU/hr]	145
		1st Iteration Insulation Surface Temp. [°F]	115
		1st Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.786
		2nd Iteration Heat Loss [BTU/hr]	100
NPS Pipe Size [in]	3.00	2nd Iteration Insulation Surface Temp. [°F]	135
Bare Pipe Surface Temp. [°F]	180	2nd Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.862
Initial Film Coefficient [BTU/hr-ft ² -°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	106
Insulation Thickness [in]	2.0	3rd Iteration Insulation Surface Temp. [°F]	132
Insulation k-Factor [BTU/hr-ft ² -°F]	0.270	3rd Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.854
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	105
External Pipe Diameter [in]	3.5	4th Iteration Insulation Surface Temp. [°F]	133
Insulation Surface Temp [°F]	133	4th Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.855

SAVINGS SUMMARY

Building ID	Thermal Savings	Safety Factor
	Therms	%
Howell Road ES	-	0.0%
James A. Dever ES	-	0.0%
Wheeler Avenue ES	915	0.0%
Willow Road ES	-	0.0%
Subtotal	915	

Exhibit G-5 - CO #1

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Exhibit G-5-5
ECM 5 - Install Pipe Insulation
Steam Piping Insulation

ECM DESCRIPTION

Insulate bare steam piping located in boiler rooms and in transition areas. Insulate tank shells where applicable.

DATA / ASSUMPTIONS

Run Hours 4,016
 * New Pipe Insulation Thermal Conductivity (k-Factor) 0.27 BTU/ft²·°F·hr
 * Proposed boiler efficiencies are used for each building

COMMISSIONING

Visual inspection per scope of work from subcontractor.

RECOVERY/SAFETY FACTOR

Thermal Safety Factor [%] = Various

FORMULAE

$$T_{SAVE} = ((q_{CONV-BARE} + q_{RAD-BARE}) - (q_{CONV-INS} + q_{RAD-INS})) \cdot t / 100,000$$

Convection Analysis

$$q_{CONV-INS} = h_{C-INS} \cdot (\pi \cdot D_{INS} \cdot L_{PIPE}) \cdot (T_{INS} - T_{AMB})$$

$$q_{CONV-BARE} = h_{C-BARE} \cdot (\pi \cdot D_{BARE} \cdot L_{PIPE}) \cdot (T_{BARE} - T_{AMB})$$

$$h_{C-INS} = 0.27 \cdot ((T_{FILM-INS} - T_{AMB}) / D_{INS})^{0.25}$$

$$h_{C-BARE} = 0.27 \cdot ((T_{BARE} - T_{AMB}) / D_{BARE})^{0.25}$$

$$T_{FILM-INS} = (T_{INS} + T_{AMB}) / 2$$

$$T_{FILM-BARE} = (T_{BARE} + T_{AMB}) / 2$$

Iterative Insulation Surface Temp Analysis

$$q_{ITER} = [(T_{BARE} - T_{AMB}) \cdot 2 \cdot \pi] / [\ln(D_{INS} / D_{BARE}) \cdot (1 / k) + (1 / (D_{INS} / 2 \cdot h_{INT}))]$$

$$T_{INS} = T_{BARE} - q_{ITER} \cdot \ln(D_{INS} / D_{BARE}) \cdot (1 / (2 \cdot \pi \cdot k))$$

$$h_{ITER} = 0.27 \cdot (T_{INS} - T_{AMB}) / D_{INS}^{0.25}$$

Radiation Analysis

$$q_{RAD-INS} = \sigma \cdot \epsilon_{INS} \cdot (\pi \cdot D_{INS} \cdot L_{PIPE}) \cdot ((T_{INS} + 460)^4 - (T_{SURR} + 460)^4)$$

$$q_{RAD-BARE} = \sigma \cdot \epsilon_{BARE} \cdot (\pi \cdot D_{BARE} \cdot L_{PIPE}) \cdot ((T_{BARE} + 460)^4 - (T_{SURR} + 460)^4)$$

$$T_{SURR} = (T_{FLOOR} + T_{CEILING} + 2 \cdot T_{WALL}) / 4$$

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Steam Piping Insulation

Variable	Units	Description
T_{SAVE}	Therms	Total thermal savings
$q_{CONV-INS}$	BTU/hr	Convective heat loss from insulated pipe
$q_{CONV-BARE}$	BTU/hr	Convective heat loss from bare pipe
h_{C-INS}	BTU/hr-ft ² -°F	Natural convective insulated pipe heat transfer film coefficient
h_{C-BARE}	BTU/hr-ft ² -°F	Natural convective bare pipe heat transfer film coefficient
$T_{FILM-INS}$	°F	Average film temperature of insulated pipe
$T_{FILM-BARE}$	°F	Average film temperature of bare pipe
k	BTU/hr-ft-°F	Thermal conductivity of pipe insulation
q_{ITER}	BTU/hr	Iterative heat loss
h_{ITER}	BTU/hr-ft ² -°F	Iterative natural convection heat transfer film coefficient
h_{INT}	BTU/hr-ft ² -°F	Initial natural convection heat transfer film coefficient (for iterations)
t	hr	Duration of the heating season
$q_{RAD-INS}$	BTU/hr	Net radiation heat loss from insulated pipe
$q_{RAD-BARE}$	BTU/hr	Net radiation heat loss from bare pipe
σ	BTU/hr-ft ² -°R ⁴	Stefan-Boltzman constant (0.1713×10^{-8})
ϵ_{INS}	-	Emissivity of insulated pipe
ϵ_{BARE}	-	Emissivity of bare pipe
A_{INS}	ft ²	Surface area of insulated pipe
A_{BARE}	ft ²	Surface area of bare pipe
L_{PIPE}	ft	Pipe length
D_{INS}	ft	Diameter of insulated pipe
D_{BARE}	ft	Diameter of bare pipe
T_{AMB}	°F	Ambient air temperature
T_{INS}	°F	Surface temperature of insulated pipe
T_{BARE}	°F	Surface temperature of bare pipe
T_{SURR}	°F	Average Surrounding temperature
T_{FLOOR}	°F	Surrounding floor temperature
$T_{CEILING}$	°F	Surrounding ceiling temperature
T_{WALL}	°F	Surrounding wall temperature

Exhibit G-5 - CO #1

Valley Stream UFSD 13
 Exhibit G-5-5
 ECM 5 - Install Pipe Insulation
 Steam Piping Insulation

CALCULATIONS

* Inputs are in blue

Subcontractor Calculations * If Yes - Please Refer to tab 'Sub Pipe Insulation' for details

Linear Feet of Pipe [ft] per Pipe Diameter Size [in]

Building	14"+ Diameter	10" Diameter	8" Diameter	6" Diameter	5" Diameter	4" Diameter	3" Diameter	2.5" Diameter	2" Diameter	1.5" Diameter	1" Diameter	0.75" Diameter	0.5" Diameter
Wheeler Avenue ES	-	-	-	-	-	-	2.0	-	-	-	-	-	-
Totals	-	-	-	-	-	-	2.0	-	-	-	-	-	-

	Wheeler Avenue ES
Total Linear Feet of Insulation [ft]	2.0
Losses from Bare Pipe [BTU/hr]	726
Losses from Insulated Pipe [BTU/hr]	302
Proposed Boiler Efficiency [%]	78.5%
Thermal Savings [Therms/hr]	0.01
Safety Factor [%]	0%
Thermal Savings [Therms]	22

Exhibit G-5 - CO #1

Valley Stream UFSD 13
Exhibit G-5-5
ECM 5 - Install Pipe Insulation
Steam Piping Insulation

Nominal Pipe Size [in]	14.00	10.00	8.00	6.00	5.00	4.00	3.00	2.50	2.00	1.50	1.00	0.75	0.50
Contact Temp. of Bare Pipe (Baseline) [°F]	220	220	220	220	220	220	220	220	220	220	220	220	220
Thickness of Insulation [in]	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	1.5	1.5	1.5	1.5
Insulation Thermal Conductivity (k-Factor) [BTU/ft ² ·°F·hr]	0.270	0.270	0.270	0.270	0.270	0.270	0.270	0.270	0.270	0.270	0.270	0.270	0.270
Pipe Length [ft]	1	1	1	1	1	1	1	1	1	1	1	1	1
Hours of Operation [hr]	4,016	4,016	4,016	4,016	4,016	4,016	4,016	4,016	4,016	4,016	4,016	4,016	4,016
Environment Temp [°F]	70	70	70	70	70	70	70	70	70	70	70	70	70
Contact Temp of Floor [°F]	60	60	60	60	60	60	60	60	60	60	60	60	60
Contact Temp of Ceiling [°F]	90	90	90	90	90	90	90	90	90	90	90	90	90
Contact Temp of Walls [°F]	75	75	75	75	75	75	75	75	75	75	75	75	75
Initial Insulation Film Coefficient Estimate [BTU/hr·ft ² ·°F]	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65
Emissivity of Bare Pipe	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Emissivity of Insulated Pipe	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Outside Diameter of Bare Pipe [in]	14.000	10.750	8.625	6.625	5.563	4.500	3.500	2.875	2.375	1.900	1.315	1.050	0.840
Outside Diameter of Insulated Pipe [in]	20.000	16.750	14.625	12.625	11.563	10.500	9.500	8.875	8.375	4.900	4.315	4.050	3.840
Characteristic Length of Bare Pipe [ft]	1.167	0.896	0.719	0.552	0.464	0.375	0.292	0.240	0.198	0.158	0.110	0.088	0.070
Characteristic Length of Insulated Pipe [ft]	1.667	1.396	1.219	1.052	0.964	0.875	0.792	0.740	0.698	0.408	0.360	0.338	0.320
Average Film Temp. of Bare Pipe [°F]	145.0	145.0	145.0	145.0	145.0	145.0	145.0	145.0	145.0	145.0	145.0	145.0	145.0
Average Film Temp. of Insulated Pipe [°F]	112	110	109	108	107	106	104	103	102	113	111	110	108
Film Coefficient of Bare Pipe [BTU/hr·ft ² ·°F]	0.909	0.971	1.026	1.096	1.145	1.207	1.286	1.351	1.417	1.498	1.642	1.737	1.837
Film Coefficient of Insulated Pipe [BTU/hr·ft ² ·°F]	0.60	0.63	0.64	0.66	0.67	0.68	0.69	0.70	0.70	0.87	0.88	0.89	0.89
Convective Losses for Bare Pipe [BTU/hr-ft]	499.85	410.01	347.72	285.30	250.26	213.46	176.79	152.54	132.18	111.81	84.84	71.67	60.62
Convective Losses for Insulated Pipe [BTU/hr-ft]	237.41	206.07	184.72	163.83	152.35	140.52	129.00	121.54	115.39	83.30	74.75	70.69	67.35
Radiant Losses of Bare Pipe [BTU/hr-ft]	745	572	459	353	296	240	186	153	126	101	70	56	45
Radiant Losses of Insulated Pipe [BTU/hr-ft]	47	39	34	29	27	25	22	21	20	11	10	9	9
Total Losses of Bare Pipe [BTU/hr-ft]	1,245	982	807	638	546	453	363	306	259	213	155	128	105
Total Losses of Insulated Pipe [BTU/hr-ft]	284	245	219	193	179	165	151	142	135	95	85	80	76

INSULATION SURFACE TEMP. CALCULATION 14.0 inch pipe		1st Iteration Heat Loss [BTU/hr]	460
		1st Iteration Insulation Surface Temp. [°F]	123
		1st Iteration Film Coefficient [BTU/hr·ft ² ·°F]	0.642
		2nd Iteration Heat Loss [BTU/hr]	296
NPS Pipe Size [in]	14.00	2nd Iteration Insulation Surface Temp. [°F]	158
Bare Pipe Surface Temp. [°F]	220	2nd Iteration Film Coefficient [BTU/hr·ft ² ·°F]	0.728
Initial Film Coefficient [BTU/hr·ft ² ·°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	317
Insulation Thickness [in]	3.0	3rd Iteration Insulation Surface Temp. [°F]	153
Insulation k-Factor [BTU/hr·ft ² ·°F]	0.270	3rd Iteration Film Coefficient [BTU/hr·ft ² ·°F]	0.718
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	315
External Pipe Diameter [in]	14.00	4th Iteration Insulation Surface Temp. [°F]	154
Insulation Surface Temp [°F]	154	4th Iteration Film Coefficient [BTU/hr·ft ² ·°F]	0.719

INSULATION SURFACE TEMP. CALCULATION 2.5 inch pipe		1st Iteration Heat Loss [BTU/hr]	162
		1st Iteration Insulation Surface Temp. [°F]	112
		1st Iteration Film Coefficient [BTU/hr·ft ² ·°F]	0.742
		2nd Iteration Heat Loss [BTU/hr]	121
NPS Pipe Size [in]	2.50	2nd Iteration Insulation Surface Temp. [°F]	140
Bare Pipe Surface Temp. [°F]	220	2nd Iteration Film Coefficient [BTU/hr·ft ² ·°F]	0.842
Initial Film Coefficient [BTU/hr·ft ² ·°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	128
Insulation Thickness [in]	3.0	3rd Iteration Insulation Surface Temp. [°F]	135
Insulation k-Factor [BTU/hr·ft ² ·°F]	0.270	3rd Iteration Film Coefficient [BTU/hr·ft ² ·°F]	0.827
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	127
External Pipe Diameter [in]	2.875	4th Iteration Insulation Surface Temp. [°F]	136
Insulation Surface Temp [°F]	136	4th Iteration Film Coefficient [BTU/hr·ft ² ·°F]	0.829

Exhibit G-5 - CO #1

Valley Stream UFSD 13
 Exhibit G-5-5
 ECM 5 - Install Pipe Insulation
 Steam Piping Insulation

INSULATION SURFACE TEMP. CALCULATION		10.0 inch pipe	
		1st Iteration Heat Loss [BTU/hr]	375
		1st Iteration Insulation Surface Temp. [°F]	122
		1st Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.667
		2nd Iteration Heat Loss [BTU/hr]	249
NPS Pipe Size [in]	10.00	2nd Iteration Insulation Surface Temp. [°F]	155
Bare Pipe Surface Temp. [°F]	220	2nd Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.754
Initial Film Coefficient [BTU/hr-ft ² -°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	266
Insulation Thickness [in]	3.0	3rd Iteration Insulation Surface Temp. [°F]	150
Insulation k-Factor [BTU/hr-ft ² -°F]	0.270	3rd Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.744
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	264
External Pipe Diameter [in]	10.75	4th Iteration Insulation Surface Temp. [°F]	151
Insulation Surface Temp [°F]	151	4th Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.745

INSULATION SURFACE TEMP. CALCULATION		2.0 inch pipe	
		1st Iteration Heat Loss [BTU/hr]	147
		1st Iteration Insulation Surface Temp. [°F]	111
		1st Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.746
		2nd Iteration Heat Loss [BTU/hr]	111
NPS Pipe Size [in]	2.00	2nd Iteration Insulation Surface Temp. [°F]	138
Bare Pipe Surface Temp. [°F]	220	2nd Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.847
Initial Film Coefficient [BTU/hr-ft ² -°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	117
Insulation Thickness [in]	3.0	3rd Iteration Insulation Surface Temp. [°F]	133
Insulation k-Factor [BTU/hr-ft ² -°F]	0.270	3rd Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.832
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	116
External Pipe Diameter [in]	2.375	4th Iteration Insulation Surface Temp. [°F]	134
Insulation Surface Temp [°F]	134	4th Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.834

INSULATION SURFACE TEMP. CALCULATION		8.0 inch pipe	
		1st Iteration Heat Loss [BTU/hr]	320
		1st Iteration Insulation Surface Temp. [°F]	121
		1st Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.685
		2nd Iteration Heat Loss [BTU/hr]	217
NPS Pipe Size [in]	8.00	2nd Iteration Insulation Surface Temp. [°F]	153
Bare Pipe Surface Temp. [°F]	220	2nd Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.775
Initial Film Coefficient [BTU/hr-ft ² -°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	231
Insulation Thickness [in]	3.0	3rd Iteration Insulation Surface Temp. [°F]	148
Insulation k-Factor [BTU/hr-ft ² -°F]	0.270	3rd Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.764
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	230
External Pipe Diameter [in]	8.625	4th Iteration Insulation Surface Temp. [°F]	149
Insulation Surface Temp [°F]	149	4th Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.765

INSULATION SURFACE TEMP. CALCULATION		1.5 inch pipe	
		1st Iteration Heat Loss [BTU/hr]	146
		1st Iteration Insulation Surface Temp. [°F]	139
		1st Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.973
		2nd Iteration Heat Loss [BTU/hr]	110
NPS Pipe Size [in]	1.50	2nd Iteration Insulation Surface Temp. [°F]	158
Bare Pipe Surface Temp. [°F]	220	2nd Iteration Film Coefficient [BTU/hr-ft ² -°F]	1.036
Initial Film Coefficient [BTU/hr-ft ² -°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	114
Insulation Thickness [in]	1.5	3rd Iteration Insulation Surface Temp. [°F]	156
Insulation k-Factor [BTU/hr-ft ² -°F]	0.270	3rd Iteration Film Coefficient [BTU/hr-ft ² -°F]	1.029
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	114
External Pipe Diameter [in]	1.9	4th Iteration Insulation Surface Temp. [°F]	156
Insulation Surface Temp [°F]	156	4th Iteration Film Coefficient [BTU/hr-ft ² -°F]	1.030

INSULATION SURFACE TEMP. CALCULATION		6.0 inch pipe	
		1st Iteration Heat Loss [BTU/hr]	266
		1st Iteration Insulation Surface Temp. [°F]	119
		1st Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.705
		2nd Iteration Heat Loss [BTU/hr]	185
NPS Pipe Size [in]	6.00	2nd Iteration Insulation Surface Temp. [°F]	150
Bare Pipe Surface Temp. [°F]	220	2nd Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.796
Initial Film Coefficient [BTU/hr-ft ² -°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	197
Insulation Thickness [in]	3.0	3rd Iteration Insulation Surface Temp. [°F]	145
Insulation k-Factor [BTU/hr-ft ² -°F]	0.270	3rd Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.785
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	196
External Pipe Diameter [in]	6.625	4th Iteration Insulation Surface Temp. [°F]	146
Insulation Surface Temp [°F]	146	4th Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.786

INSULATION SURFACE TEMP. CALCULATION		1.0 inch pipe	
		1st Iteration Heat Loss [BTU/hr]	121
		1st Iteration Insulation Surface Temp. [°F]	135
		1st Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.990
		2nd Iteration Heat Loss [BTU/hr]	94
NPS Pipe Size [in]	1.00	2nd Iteration Insulation Surface Temp. [°F]	154
Bare Pipe Surface Temp. [°F]	220	2nd Iteration Film Coefficient [BTU/hr-ft ² -°F]	1.056
Initial Film Coefficient [BTU/hr-ft ² -°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	98
Insulation Thickness [in]	1.5	3rd Iteration Insulation Surface Temp. [°F]	152
Insulation k-Factor [BTU/hr-ft ² -°F]	0.270	3rd Iteration Film Coefficient [BTU/hr-ft ² -°F]	1.048
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	97
External Pipe Diameter [in]	1.315	4th Iteration Insulation Surface Temp. [°F]	152
Insulation Surface Temp [°F]	152	4th Iteration Film Coefficient [BTU/hr-ft ² -°F]	1.049

Exhibit G-5 - CO #1

Valley Stream UFSD 13
 Exhibit G-5-5
 ECM 5 - Install Pipe Insulation
 Steam Piping Insulation

INSULATION SURFACE TEMP. CALCULATION		5.0 inch pipe	
		1st Iteration Heat Loss [BTU/hr]	238
		1st Iteration Insulation Surface Temp. [°F]	118
		1st Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.716
		2nd Iteration Heat Loss [BTU/hr]	168
NPS Pipe Size [in]	5.00	2nd Iteration Insulation Surface Temp. [°F]	148
Bare Pipe Surface Temp. [°F]	220	2nd Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.809
Initial Film Coefficient [BTU/hr-ft ² -°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	179
Insulation Thickness [in]	3.0	3rd Iteration Insulation Surface Temp. [°F]	143
Insulation k-Factor [BTU/hr-ft ² -°F]	0.270	3rd Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.796
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	177
External Pipe Diameter [in]	5.563	4th Iteration Insulation Surface Temp. [°F]	144
Insulation Surface Temp [°F]	144	4th Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.798

INSULATION SURFACE TEMP. CALCULATION		0.75 inch pipe	
		1st Iteration Heat Loss [BTU/hr]	110
		1st Iteration Insulation Surface Temp. [°F]	133
		1st Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.997
		2nd Iteration Heat Loss [BTU/hr]	86
NPS Pipe Size [in]	0.75	2nd Iteration Insulation Surface Temp. [°F]	151
Bare Pipe Surface Temp. [°F]	220	2nd Iteration Film Coefficient [BTU/hr-ft ² -°F]	1.064
Initial Film Coefficient [BTU/hr-ft ² -°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	89
Insulation Thickness [in]	1.5	3rd Iteration Insulation Surface Temp. [°F]	149
Insulation k-Factor [BTU/hr-ft ² -°F]	0.270	3rd Iteration Film Coefficient [BTU/hr-ft ² -°F]	1.056
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	89
External Pipe Diameter [in]	1.05	4th Iteration Insulation Surface Temp. [°F]	149
Insulation Surface Temp [°F]	149	4th Iteration Film Coefficient [BTU/hr-ft ² -°F]	1.057

INSULATION SURFACE TEMP. CALCULATION		4.0 inch pipe	
		1st Iteration Heat Loss [BTU/hr]	208
		1st Iteration Insulation Surface Temp. [°F]	116
		1st Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.727
		2nd Iteration Heat Loss [BTU/hr]	150
NPS Pipe Size [in]	4.00	2nd Iteration Insulation Surface Temp. [°F]	145
Bare Pipe Surface Temp. [°F]	220	2nd Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.822
Initial Film Coefficient [BTU/hr-ft ² -°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	159
Insulation Thickness [in]	3.0	3rd Iteration Insulation Surface Temp. [°F]	140
Insulation k-Factor [BTU/hr-ft ² -°F]	0.270	3rd Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.809
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	158
External Pipe Diameter [in]	4.5	4th Iteration Insulation Surface Temp. [°F]	141
Insulation Surface Temp [°F]	141	4th Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.811

INSULATION SURFACE TEMP. CALCULATION		0.5 inch pipe	
		1st Iteration Heat Loss [BTU/hr]	100
		1st Iteration Insulation Surface Temp. [°F]	130
		1st Iteration Film Coefficient [BTU/hr-ft ² -°F]	1.001
		2nd Iteration Heat Loss [BTU/hr]	79
NPS Pipe Size [in]	0.50	2nd Iteration Insulation Surface Temp. [°F]	149
Bare Pipe Surface Temp. [°F]	220	2nd Iteration Film Coefficient [BTU/hr-ft ² -°F]	1.070
Initial Film Coefficient [BTU/hr-ft ² -°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	82
Insulation Thickness [in]	1.5	3rd Iteration Insulation Surface Temp. [°F]	146
Insulation k-Factor [BTU/hr-ft ² -°F]	0.270	3rd Iteration Film Coefficient [BTU/hr-ft ² -°F]	1.061
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	82
External Pipe Diameter [in]	0.84	4th Iteration Insulation Surface Temp. [°F]	147
Insulation Surface Temp [°F]	147	4th Iteration Film Coefficient [BTU/hr-ft ² -°F]	1.062

INSULATION SURFACE TEMP. CALCULATION		3.0 inch pipe	
		1st Iteration Heat Loss [BTU/hr]	180
		1st Iteration Insulation Surface Temp. [°F]	114
		1st Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.737
		2nd Iteration Heat Loss [BTU/hr]	132
NPS Pipe Size [in]	3.00	2nd Iteration Insulation Surface Temp. [°F]	142
Bare Pipe Surface Temp. [°F]	220	2nd Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.834
Initial Film Coefficient [BTU/hr-ft ² -°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	140
Insulation Thickness [in]	3.0	3rd Iteration Insulation Surface Temp. [°F]	138
Insulation k-Factor [BTU/hr-ft ² -°F]	0.270	3rd Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.821
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	139
External Pipe Diameter [in]	3.5	4th Iteration Insulation Surface Temp. [°F]	138
Insulation Surface Temp [°F]	138	4th Iteration Film Coefficient [BTU/hr-ft ² -°F]	0.822

SAVINGS SUMMARY

Building ID	Thermal Savings	Safety Factor
	Therms	%
Howell Road ES	-	0.0%
James A. Dever ES	-	0.0%
Wheeler Avenue ES	22	0.0%
Willow Road ES	-	0.0%
Subtotal	22	

Exhibit G-5 - CO #1

Valley Stream UFSD 13
Exhibit G-5-6
ECM 6 - Building Management System Upgrades

ECM DESCRIPTION

The school district's building management system will be upgraded to allow for the implementation of advanced control strategies. The existing DDC controls in some buildings will be upgraded to state of the art technology. All new DDC controls will be integrated into the web-based front end that allows remote access by personnel using a security password.

DATA / ASSUMPTIONS

Heating Season Hours 4,016 Hours

*Schedules and temperature setpoints are based on interviews with facility personnel and data logging trends performed throughout the buildings

COMMISSIONING

Verify functions of all installed controllers. Verify that control loops work properly. Verify function of all alarms installed in the system. Verify that all installed control variables and set points can be set and managed remotely

RECOVERY/SAFETY FACTOR

Electric Safety Factor [%] = 0%
 Thermal Safety Factor [%] = 0%

FORMULAE

$$Q_{SAVINGS} = (HD_{EXISTING} - HD_{PROPOSED} / HD_{EXISTING}) \cdot Fuel_{ADJUSTED}$$

$$HD_{EXISTING} = \sum_{-15}^{60} [(T_{OCC} - T_{BIN}) \cdot t_{OCC} + (T_{UNOCC} - T_{BIN}) \cdot t_{UNOCC}]$$

$$HD_{PROPOSED} = \sum_{-15}^{60} [(T_{OCC} - T_{BIN}) \cdot t_{OCC} + (T_{UNOCC} - T_{BIN}) \cdot t_{UNOCC}]$$

Variable	Units	Description
Q _{savings}	Therms	Thermal Savings
\sum_{-15}^{60}	-	Summation of all bins from -15°F to 60°F
T _{BIN}	°F	Temperature of respective bin
t _{OCC}	Hrs	Existing occupied Bin Hours in respective temperature bin
t _{UNOCC}	Hrs	Existing unoccupied Bin Hours in respective temperature bin
t _{OCC}	Hrs	Proposed occupied Bin Hours in respective temperature bin
t _{UNOCC}	Hrs	Proposed unoccupied Bin Hours in respective temperature bin
T _{OCC}	°F	Existing temperature of space during occupied hours
T _{UNOCC}	°F	Existing temperature of space during unoccupied hours
T _{OCC}	°F	Proposed temperature of space during occupied hours
T _{UNOCC}	°F	Proposed temperature of space during unoccupied hours
HD _{EXISTING}	°F-Hrs	Existing heating degree hours in space
HD _{PROPOSED}	°F-Hrs	Proposed heating degree hours in space
Fuel _{ADJUSTED}	Therms	Adjusted Boiler Fuel Usage

* Inputs for Section 1 and Section 2 are in blue

Building	EXISTING									
	Section 1					Section 2				
	Percentage of Building [%]	Occ. Heating Temp [°F]	Unocc. Heating Temp [°F]	Occ. Cooling Temp [°F]	Unocc. Cooling Temp [°F]	Percentage of Building [%]	Occ. Heating Temp [°F]	Unocc. Heating Temp [°F]	Occ. Cooling Temp [°F]	Unocc. Cooling Temp [°F]
Howell Road ES	100%	71.0	68.0	74.0	85.0					
James A. Dever ES	100%	72.0	68.0	74.0	85.0					
Wheeler Avenue ES	100%	72.0	68.0	74.0	85.0					
Willow Road ES	100%	72.0	70.0	74.0	85.0					

PROPOSED							
Section 1				Section 2			
Occ. Heating Temp [°F]	Unocc. Heating Temp [°F]	Occ. Cooling Temp [°F]	Unocc. Cooling Temp [°F]	Occ. Heating Temp [°F]	Unocc. Heating Temp [°F]	Occ. Cooling Temp [°F]	Unocc. Cooling Temp [°F]
68.0	55.0	74.0	85.0				
68.0	55.0	74.0	85.0				
68.0	55.0	74.0	85.0				
68.0	55.0	74.0	85.0				

Exhibit G-5 - CO #1

Valley Stream UFSD 13
 Exhibit G-5-6
 ECM 6 - Building Management System Upgrades

Thermal Night Setback Savings Calculations

	Howell Road ES	James A. Dever ES	Wheeler Avenue ES	Willow Road ES
Occupied Bin Hours	1,404	1,404	1,404	1,404
Occupied Heating Degree Hours [HD-Hrs]	42,800	44,205	44,205	44,205
Annual Boiler Usage [Therms]	56,810	47,138	33,812	48,811
Adjusted Annual Boiler Usage [Therms]	56,887	47,124	33,243	49,098
Existing Heating Degree Hours [HD-Hrs]	118,731	120,136	120,136	125,359
Proposed Heating Degree Hours [HD-Hrs]	74,778	74,047	74,778	74,121
Thermal Normalization Factor [%]	30%	30%	30%	30%
Thermal Safety Factor [%]	0%	0%	0%	0%
Thermal Savings [%]	25.9%	26.9%	26.4%	28.6%
Thermal Savings [Therms]	14,741	12,655	8,786	14,047

HOWELL ROAD ES

Amb. Temp Bin [°F]	Ave Temp [°F]	01-08 Hours	09-16 Hours	17-24 Hours	Total Bin Hours	Current Operating Schedule										Proposed Operating Schedule												
						Occup. Bin Hours	Unocc. Bin Hours	Occup. Indoor Temp [°F]	Unocc. Indoor Temp [°F]	Occup. Cooling Degree Hours [CD-Hrs]	Unocc. Cooling Degree Hours [CD-Hrs]	Total Cooling Degree Hours [CD-Hrs]	Occup. Indoor Temp [°F]	Unocc. Indoor Temp [°F]	Occup. Cooling Degree Hours [CD-Hrs]	Unocc. Cooling Degree Hours [CD-Hrs]	Total Cooling Degree Hours [CD-Hrs]	Occup. Bin Hours	Unocc. Bin Hours	Occup. Indoor Temp [°F]	Unocc. Indoor Temp [°F]	Occup. Cooling Degree Hours [CD-Hrs]	Unocc. Cooling Degree Hours [CD-Hrs]	Total Cooling Degree Hours [CD-Hrs]				
						Building	Building	Section 1	Section 1	Section 1	Section 1	Section 1	Section 2	Section 2	Section 2	Section 2	Section 2	Building										
COOLING																												
100 to 105	102.5	-	-	-	-	-	-	74.0	85.0	-	-	-	-	-	-	-	-	-	-	74.0	85.0	-	-	-	-	-	-	-
95 to 100	97.5	-	3	-	3	2	1	74.0	85.0	50	11	61	-	-	-	-	61	2	1	74.0	85.0	47	12	60				
90 to 95	92.5	-	18	3	21	13	8	74.0	85.0	248	57	305	-	-	-	-	305	12	9	74.0	85.0	223	67	290				
85 to 90	87.5	-	100	18	118	75	43	74.0	85.0	1,008	108	1,116	-	-	-	-	1,116	67	51	74.0	85.0	904	128	1,032				
80 to 85	82.5	37	292	126	455	238	217	74.0	85.0	2,020	-	2,020	-	-	-	-	2,020	197	258	74.0	85.0	1,676	-	1,676				
75 to 80	77.5	189	289	247	725	284	441	74.0	85.0	995	-	995	-	-	-	-	995	202	523	74.0	85.0	707	-	707				
70 to 75	72.5	275	200	270	745	240	505	74.0	85.0	-	-	-	-	-	-	-	-	146	599	74.0	85.0	-	-	-				
65 to 70	67.5	236	184	245	665	217	448	74.0	85.0	-	-	-	-	-	-	-	-	134	531	74.0	85.0	-	-	-				
60 to 65	62.5	232	158	196	586	189	397	74.0	85.0	-	-	-	-	-	-	-	-	116	470	74.0	85.0	-	-	-				
Total		969	1,244	1,105	3,318	1,259	2,059			4,321	176	4,497					4,497	876	2,442			3,557	207	3,764				
Amb. Temp Bin [°F]	Ave Temp [°F]	01-08 Hours	09-16 Hours	17-24 Hours	Total Bin Hours	Occup. Bin Hours	Unocc. Bin Hours	Occup. Indoor Temp [°F]	Unocc. Indoor Temp [°F]	Occup. Heating Degree Hours [HD-Hrs]	Unocc. Heating Degree Hours [HD-Hrs]	Total Heating Degree Hours [HD-Hrs]	Occup. Indoor Temp [°F]	Unocc. Indoor Temp [°F]	Occup. Heating Degree Hours [HD-Hrs]	Unocc. Heating Degree Hours [HD-Hrs]	Total Heating Degree Hours [HD-Hrs]	Occup. Bin Hours	Unocc. Bin Hours	Occup. Indoor Temp [°F]	Unocc. Indoor Temp [°F]	Occup. Heating Degree Hours [HD-Hrs]	Unocc. Heating Degree Hours [HD-Hrs]	Total Heating Degree Hours [HD-Hrs]				
HEATING																												
55 to 60	57.5	60	127	96	283	119	164	71.0	68.0	1,601	1,727	3,327	-	-	-	-	3,327	88	195	68	55	921	-	921				
50 to 55	52.5	110	178	125	413	169	244	71.0	68.0	3,128	3,780	6,909	-	-	-	-	6,909	124	289	68	55	1,924	722	2,646				
45 to 50	47.5	108	164	121	393	158	235	71.0	68.0	3,714	4,817	8,531	-	-	-	-	8,531	115	278	68	55	2,350	2,088	4,438				
40 to 45	42.5	240	251	280	771	272	499	71.0	68.0	7,756	12,721	20,477	-	-	-	-	20,477	179	592	68	55	4,559	7,403	11,962				
35 to 40	37.5	355	282	362	999	329	670	71.0	68.0	11,037	20,421	31,458	-	-	-	-	31,458	205	794	68	55	6,243	13,900	20,143				
30 to 35	32.5	239	120	167	526	158	368	71.0	68.0	6,091	13,056	19,148	-	-	-	-	19,148	91	435	68	55	3,231	9,787	13,018				
25 to 30	27.5	109	76	81	266	88	178	71.0	68.0	3,837	7,200	11,038	-	-	-	-	11,038	56	210	68	55	2,258	5,782	8,040				
20 to 25	22.5	100	51	72	223	67	156	71.0	68.0	3,256	7,092	10,348	-	-	-	-	10,348	39	184	68	55	1,757	5,992	7,750				
15 to 20	17.5	58	29	25	112	36	76	71.0	68.0	1,901	3,861	5,763	-	-	-	-	5,763	22	90	68	55	1,111	3,375	4,486				
10 to 15	12.5	10	5	6	21	6	15	71.0	68.0	376	809	1,185	-	-	-	-	1,185	4	17	68	55	211	731	942				
5 to 10	7.5	8	-	1	9	2	7	71.0	68.0	102	447	549	-	-	-	-	549	0	9	68	55	22	411	432				
0 to 5	2.5	-	-	-	-	-	-	71.0	68.0	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-				
-5 to 0	(2.5)	-	-	-	-	-	-	71.0	68.0	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-				
-10 to -5	(7.5)	-	-	-	-	-	-	71.0	68.0	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-				
-15 to -10	(12.5)	-	-	-	-	-	-	71.0	68.0	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-				
Total		1,397	1,283	1,336	4,016	1,404	2,612			42,800	75,931	118,731					118,731	922	3,094			24,588	50,190	74,778				

Exhibit G-5 - CO #1

Valley Stream UFSD 13
 Exhibit G-5-6
 ECM 6 - Building Management System Upgrades

JAMES A. DEVER ES

Amb. Temp Bin [°F]	Ave Temp [°F]	01-08 Hours	09-16 Hours	17-24 Hours	Total Bin Hours	Current Operating Schedule										Proposed Operating Schedule										
						Occup. Bin Hours	Unocc. Bin Hours	Occup. Indoor Temp [°F]	Unocc. Indoor Temp [°F]	Occup. Cooling Degree Hours [CD-Hrs]	Unocc. Cooling Degree Hours [CD-Hrs]	Total Cooling Degree Hours [CD-Hrs]	Occup. Indoor Temp [°F]	Unocc. Indoor Temp [°F]	Occup. Cooling Degree Hours [CD-Hrs]	Unocc. Cooling Degree Hours [CD-Hrs]	Total Cooling Degree Hours [CD-Hrs]	Occup. Bin Hours	Unocc. Bin Hours	Occup. Indoor Temp [°F]	Unocc. Indoor Temp [°F]	Occup. Cooling Degree Hours [CD-Hrs]	Unocc. Cooling Degree Hours [CD-Hrs]	Total Cooling Degree Hours [CD-Hrs]		
						Building	Building	Section 1	Section 1	Section 1	Section 1	Section 1	Section 2	Section 2	Section 2	Section 2	Section 2	Section 2	Building							
COOLING																										
100 to 105	102.5	-	-	-	-	-	-	74.0	85.0	-	-	-	-	-	-	-	-	-	-	-	74.0	85.0	-	-		
95 to 100	97.5	-	3	-	3	2	1	74.0	85.0	50	11	61	-	-	-	-	-	-	61	2	1	74.0	85.0	44	14	58
90 to 95	92.5	-	18	3	21	13	8	74.0	85.0	248	57	305	-	-	-	-	-	-	305	11	10	74.0	85.0	208	73	281
85 to 90	87.5	-	100	18	118	75	43	74.0	85.0	1,008	108	1,116	-	-	-	-	-	-	1,116	63	55	74.0	85.0	844	139	983
80 to 85	82.5	37	292	126	455	238	217	74.0	85.0	2,020	-	2,020	-	-	-	-	-	-	2,020	184	271	74.0	85.0	1,565	-	1,565
75 to 80	77.5	189	289	247	725	284	441	74.0	85.0	995	-	995	-	-	-	-	-	-	995	189	536	74.0	85.0	662	-	662
70 to 75	72.5	275	200	270	745	240	505	74.0	85.0	-	-	-	-	-	-	-	-	-	-	137	608	74.0	85.0	-	-	-
65 to 70	67.5	236	184	245	665	217	448	74.0	85.0	-	-	-	-	-	-	-	-	-	-	126	539	74.0	85.0	-	-	-
60 to 65	62.5	232	158	196	586	189	397	74.0	85.0	-	-	-	-	-	-	-	-	-	-	109	477	74.0	85.0	-	-	-
Total		969	1,244	1,105	3,318	1,259	2,059			4,321	176	4,497							4,497	821	2,497			3,323	226	3,549
Amb. Temp Bin [°F]	Ave Temp [°F]	01-08 Hours	09-16 Hours	17-24 Hours	Total Bin Hours	Occup. Bin Hours	Unocc. Bin Hours	Occup. Indoor Temp [°F]	Unocc. Indoor Temp [°F]	Occup. Heating Degree Hours [HD-Hrs]	Unocc. Heating Degree Hours [HD-Hrs]	Total Heating Degree Hours [HD-Hrs]	Occup. Indoor Temp [°F]	Unocc. Indoor Temp [°F]	Occup. Heating Degree Hours [HD-Hrs]	Unocc. Heating Degree Hours [HD-Hrs]	Total Heating Degree Hours [HD-Hrs]	Occup. Bin Hours	Unocc. Bin Hours	Occup. Indoor Temp [°F]	Unocc. Indoor Temp [°F]	Occup. Heating Degree Hours [HD-Hrs]	Unocc. Heating Degree Hours [HD-Hrs]	Total Heating Degree Hours [HD-Hrs]		
HEATING																										
55 to 60	57.5	60	127	96	283	119	164	72.0	68.0	1,719	1,727	3,446	-	-	-	-	-	3,446	82	201	68	55	862	-	862	
50 to 55	52.5	110	178	125	413	169	244	72.0	68.0	3,298	3,780	7,078	-	-	-	-	-	7,078	116	297	68	55	1,800	742	2,543	
45 to 50	47.5	108	164	121	393	158	235	72.0	68.0	3,872	4,817	8,689	-	-	-	-	-	8,689	107	286	68	55	2,200	2,143	4,343	
40 to 45	42.5	240	251	280	771	272	499	72.0	68.0	8,028	12,721	20,749	-	-	-	-	-	20,749	168	603	68	55	4,274	7,543	11,816	
35 to 40	37.5	355	282	362	999	329	670	72.0	68.0	11,367	20,421	31,787	-	-	-	-	-	31,787	192	807	68	55	5,859	14,121	19,980	
30 to 35	32.5	239	120	167	526	158	368	72.0	68.0	6,249	13,056	19,306	-	-	-	-	-	19,306	86	440	68	55	3,041	9,907	12,949	
25 to 30	27.5	109	76	81	266	88	178	72.0	68.0	3,926	7,200	11,126	-	-	-	-	-	11,126	52	214	68	55	2,121	5,875	7,996	
20 to 25	22.5	100	51	72	223	67	156	72.0	68.0	3,324	7,092	10,415	-	-	-	-	-	10,415	36	187	68	55	1,653	6,066	7,720	
15 to 20	17.5	58	29	25	112	36	76	72.0	68.0	1,937	3,861	5,798	-	-	-	-	-	5,798	21	91	68	55	1,046	3,423	4,469	
10 to 15	12.5	10	5	6	21	6	15	72.0	68.0	382	809	1,191	-	-	-	-	-	1,191	4	17	68	55	198	741	939	
5 to 10	7.5	8	-	1	9	2	7	72.0	68.0	104	447	551	-	-	-	-	-	551	0	9	68	55	22	411	432	
0 to 5	2.5	-	-	-	-	-	-	72.0	68.0	-	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-	
-5 to 0	(2.5)	-	-	-	-	-	-	72.0	68.0	-	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-	
-10 to -5	(7.5)	-	-	-	-	-	-	72.0	68.0	-	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-	
-15 to -10	(12.5)	-	-	-	-	-	-	72.0	68.0	-	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-	
Total		1,397	1,283	1,336	4,016	1,404	2,612			44,205	75,931	120,136						120,136	864	3,152			23,076	50,971	74,047	

Exhibit G-5 - CO #1

Valley Stream UFSD 13
 Exhibit G-5-6
 ECM 6 - Building Management System Upgrades

WHEELER AVENUE ES

Amb. Temp Bin [°F]	Ave Temp [°F]	01-08 Hours	09-16 Hours	17-24 Hours	Total Bin Hours	Current Operating Schedule										Proposed Operating Schedule										
						Occup. Bin Hours	Unocc. Bin Hours	Occup. Indoor Temp [°F]	Unocc. Indoor Temp [°F]	Occup. Cooling Degree Hours [CD-Hrs]	Unocc. Cooling Degree Hours [CD-Hrs]	Total Cooling Degree Hours [CD-Hrs]	Occup. Indoor Temp [°F]	Unocc. Indoor Temp [°F]	Occup. Cooling Degree Hours [CD-Hrs]	Unocc. Cooling Degree Hours [CD-Hrs]	Total Cooling Degree Hours [CD-Hrs]	Occup. Bin Hours	Unocc. Bin Hours	Occup. Indoor Temp [°F]	Unocc. Indoor Temp [°F]	Occup. Cooling Degree Hours [CD-Hrs]	Unocc. Cooling Degree Hours [CD-Hrs]	Total Cooling Degree Hours [CD-Hrs]		
						Building	Building	Section 1	Section 1	Section 1	Section 1	Section 1	Section 2	Section 2	Section 2	Section 2	Section 2	Section 2	Building							
COOLING																										
100 to 105	102.5	-	-	-	-	-	-	74.0	85.0	-	-	-	-	-	-	-	-	-	-	-	-	74.0	85.0	-	-	
95 to 100	97.5	-	3	-	3	2	1	74.0	85.0	50	11	61	-	-	-	-	-	-	61	2	1	74.0	85.0	47	12	60
90 to 95	92.5	-	18	3	21	13	8	74.0	85.0	248	57	305	-	-	-	-	-	-	305	12	9	74.0	85.0	223	67	290
85 to 90	87.5	-	100	18	118	75	43	74.0	85.0	1,008	108	1,116	-	-	-	-	-	-	1,116	67	51	74.0	85.0	904	128	1,032
80 to 85	82.5	37	292	126	455	238	217	74.0	85.0	2,020	-	2,020	-	-	-	-	-	-	2,020	197	258	74.0	85.0	1,676	-	1,676
75 to 80	77.5	189	289	247	725	284	441	74.0	85.0	995	-	995	-	-	-	-	-	-	995	202	523	74.0	85.0	707	-	707
70 to 75	72.5	275	200	270	745	240	505	74.0	85.0	-	-	-	-	-	-	-	-	-	-	146	599	74.0	85.0	-	-	-
65 to 70	67.5	236	184	245	665	217	448	74.0	85.0	-	-	-	-	-	-	-	-	-	-	134	531	74.0	85.0	-	-	-
60 to 65	62.5	232	158	196	586	189	397	74.0	85.0	-	-	-	-	-	-	-	-	-	-	116	470	74.0	85.0	-	-	-
Total		969	1,244	1,105	3,318	1,259	2,059			4,321	176	4,497							4,497	876	2,442			3,557	207	3,764
Amb. Temp Bin [°F]	Ave Temp [°F]	01-08 Hours	09-16 Hours	17-24 Hours	Total Bin Hours	Occup. Bin Hours	Unocc. Bin Hours	Occup. Indoor Temp [°F]	Unocc. Indoor Temp [°F]	Occup. Heating Degree Hours [HD-Hrs]	Unocc. Heating Degree Hours [HD-Hrs]	Total Heating Degree Hours [HD-Hrs]	Occup. Indoor Temp [°F]	Unocc. Indoor Temp [°F]	Occup. Heating Degree Hours [HD-Hrs]	Unocc. Heating Degree Hours [HD-Hrs]	Total Heating Degree Hours [HD-Hrs]	Occup. Bin Hours	Unocc. Bin Hours	Occup. Indoor Temp [°F]	Unocc. Indoor Temp [°F]	Occup. Heating Degree Hours [HD-Hrs]	Unocc. Heating Degree Hours [HD-Hrs]	Total Heating Degree Hours [HD-Hrs]		
HEATING																										
55 to 60	57.5	60	127	96	283	119	164	72.0	68.0	1,719	1,727	3,446	-	-	-	-	-	3,446	88	195	68	55	921	-	921	
50 to 55	52.5	110	178	125	413	169	244	72.0	68.0	3,298	3,780	7,078	-	-	-	-	-	7,078	124	289	68	55	1,924	722	2,646	
45 to 50	47.5	108	164	121	393	158	235	72.0	68.0	3,872	4,817	8,689	-	-	-	-	-	8,689	115	278	68	55	2,350	2,088	4,438	
40 to 45	42.5	240	251	280	771	272	499	72.0	68.0	8,028	12,721	20,749	-	-	-	-	-	20,749	179	592	68	55	4,559	7,403	11,962	
35 to 40	37.5	355	282	362	999	329	670	72.0	68.0	11,367	20,421	31,787	-	-	-	-	-	31,787	205	794	68	55	6,243	13,900	20,143	
30 to 35	32.5	239	120	167	526	158	368	72.0	68.0	6,249	13,056	19,306	-	-	-	-	-	19,306	91	435	68	55	3,231	9,787	13,018	
25 to 30	27.5	109	76	81	266	88	178	72.0	68.0	3,926	7,200	11,126	-	-	-	-	-	11,126	56	210	68	55	2,258	5,782	8,040	
20 to 25	22.5	100	51	72	223	67	156	72.0	68.0	3,324	7,092	10,415	-	-	-	-	-	10,415	39	184	68	55	1,757	5,992	7,750	
15 to 20	17.5	58	29	25	112	36	76	72.0	68.0	1,937	3,861	5,798	-	-	-	-	-	5,798	22	90	68	55	1,111	3,375	4,486	
10 to 15	12.5	10	5	6	21	6	15	72.0	68.0	382	809	1,191	-	-	-	-	-	1,191	4	17	68	55	211	731	942	
5 to 10	7.5	8	-	1	9	2	7	72.0	68.0	104	447	551	-	-	-	-	-	551	0	9	68	55	22	411	432	
0 to 5	2.5	-	-	-	-	-	-	72.0	68.0	-	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-	
-5 to 0	(2.5)	-	-	-	-	-	-	72.0	68.0	-	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-	
-10 to -5	(7.5)	-	-	-	-	-	-	72.0	68.0	-	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-	
-15 to -10	(12.5)	-	-	-	-	-	-	72.0	68.0	-	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-	
Total		1,397	1,283	1,336	4,016	1,404	2,612			44,205	75,931	120,136						120,136	922	3,094			24,588	50,190	74,778	

Exhibit G-5 - CO #1

Valley Stream UFSD 13
 Exhibit G-5-6
 ECM 6 - Building Management System Upgrades

WILLOW ROAD ES

		Current Operating Schedule																Proposed Operating Schedule									
Amb. Temp Bin [°F]	Ave Temp [°F]	01-08 Hours	09-16 Hours	17-24 Hours	Total Bin Hours	Occup. Bin Hours	Unocc. Bin Hours	Occup. Indoor Temp [°F]	Unocc. Indoor Temp [°F]	Occup. Cooling Degree Hours [CD-Hrs]	Unocc. Cooling Degree Hours [CD-Hrs]	Total Cooling Degree Hours [CD-Hrs]	Occup. Indoor Temp [°F]	Unocc. Indoor Temp [°F]	Occup. Cooling Degree Hours [CD-Hrs]	Unocc. Cooling Degree Hours [CD-Hrs]	Total Cooling Degree Hours [CD-Hrs]	Total Cooling Degree Hours [CD-Hrs]	Occup. Bin Hours	Unocc. Bin Hours	Occup. Indoor Temp [°F]	Unocc. Indoor Temp [°F]	Occup. Cooling Degree Hours [CD-Hrs]	Unocc. Cooling Degree Hours [CD-Hrs]	Total Cooling Degree Hours [CD-Hrs]		
						Building		Section 1	Section 1	Section 1	Section 1	Section 1	Section 2	Section 2	Section 2	Section 2	Section 2	Section 2	Building								
COOLING																											
100 to 105	102.5	-	-	-	-	-	-	74.0	85.0	-	-	-	-	-	-	-	-	-	-	-	-	74.0	85.0	-	-	-	
95 to 100	97.5	-	3	-	3	2	1	74.0	85.0	50	11	61	-	-	-	-	-	61	2	1	74.0	85.0	41	16	57		
90 to 95	92.5	-	18	3	21	13	8	74.0	85.0	248	57	305	-	-	-	-	-	305	10	11	74.0	85.0	193	79	272		
85 to 90	87.5	-	100	18	118	75	43	74.0	85.0	1,008	108	1,116	-	-	-	-	-	1,116	58	60	74.0	85.0	783	150	933		
80 to 85	82.5	37	292	126	455	238	217	74.0	85.0	2,020	-	2,020	-	-	-	-	-	2,020	173	282	74.0	85.0	1,469	-	1,469		
75 to 80	77.5	189	289	247	725	284	441	74.0	85.0	995	-	995	-	-	-	-	-	995	185	540	74.0	85.0	646	-	646		
70 to 75	72.5	275	200	270	745	240	505	74.0	85.0	-	-	-	-	-	-	-	-	-	141	604	74.0	85.0	-	-	-		
65 to 70	67.5	236	184	245	665	217	448	74.0	85.0	-	-	-	-	-	-	-	-	-	128	537	74.0	85.0	-	-	-		
60 to 65	62.5	232	158	196	586	189	397	74.0	85.0	-	-	-	-	-	-	-	-	-	112	474	74.0	85.0	-	-	-		
Total		969	1,244	1,105	3,318	1,259	2,059			4,321	176	4,497						4,497	808	2,510			3,132	245	3,377		
Amb. Temp Bin [°F]	Ave Temp [°F]	01-08 Hours	09-16 Hours	17-24 Hours	Total Bin Hours	Occup. Bin Hours	Unocc. Bin Hours	Occup. Indoor Temp [°F]	Unocc. Indoor Temp [°F]	Occup. Heating Degree Hours [HD-Hrs]	Unocc. Heating Degree Hours [HD-Hrs]	Total Heating Degree Hours [HD-Hrs]	Occup. Indoor Temp [°F]	Unocc. Indoor Temp [°F]	Occup. Heating Degree Hours [HD-Hrs]	Unocc. Heating Degree Hours [HD-Hrs]	Total Heating Degree Hours [HD-Hrs]	Total Heating Degree Hours [HD-Hrs]	Occup. Bin Hours	Unocc. Bin Hours	Occup. Indoor Temp [°F]	Unocc. Indoor Temp [°F]	Occup. Heating Degree Hours [HD-Hrs]	Unocc. Heating Degree Hours [HD-Hrs]	Total Heating Degree Hours [HD-Hrs]		
HEATING																											
55 to 60	57.5	60	127	96	283	119	164	72.0	70.0	1,719	2,055	3,775	-	-	-	-	-	3,775	79	204	68	55	830	-	830		
50 to 55	52.5	110	178	125	413	169	244	72.0	70.0	3,298	4,268	7,566	-	-	-	-	-	7,566	113	300	68	55	1,753	750	2,503		
45 to 50	47.5	108	164	121	393	158	235	72.0	70.0	3,872	5,287	9,159	-	-	-	-	-	9,159	105	288	68	55	2,149	2,161	4,310		
40 to 45	42.5	240	251	280	771	272	499	72.0	70.0	8,028	13,719	21,747	-	-	-	-	-	21,747	167	604	68	55	4,261	7,549	11,810		
35 to 40	37.5	355	282	362	999	329	670	72.0	70.0	11,367	21,760	33,126	-	-	-	-	-	33,126	195	804	68	55	5,958	14,064	20,022		
30 to 35	32.5	239	120	167	526	158	368	72.0	70.0	6,249	13,792	20,041	-	-	-	-	-	20,041	91	435	68	55	3,230	9,788	13,018		
25 to 30	27.5	109	76	81	266	88	178	72.0	70.0	3,926	7,556	11,481	-	-	-	-	-	11,481	54	212	68	55	2,180	5,834	8,015		
20 to 25	22.5	100	51	72	223	67	156	72.0	70.0	3,324	7,403	10,727	-	-	-	-	-	10,727	39	184	68	55	1,753	5,995	7,748		
15 to 20	17.5	58	29	25	112	36	76	72.0	70.0	1,937	4,014	5,951	-	-	-	-	-	5,951	22	90	68	55	1,111	3,375	4,486		
10 to 15	12.5	10	5	6	21	6	15	72.0	70.0	382	838	1,220	-	-	-	-	-	1,220	4	17	68	55	211	731	942		
5 to 10	7.5	8	-	1	9	2	7	72.0	70.0	104	462	566	-	-	-	-	-	566	1	8	68	55	43	394	437		
0 to 5	2.5	-	-	-	-	-	-	72.0	70.0	-	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-		
-5 to 0	(2.5)	-	-	-	-	-	-	72.0	70.0	-	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-		
-10 to -5	(7.5)	-	-	-	-	-	-	72.0	70.0	-	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-		
-15 to -10	(12.5)	-	-	-	-	-	-	72.0	70.0	-	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-		
Total		1,397	1,283	1,336	4,016	1,404	2,612			44,205	81,154	125,359						125,359	869	3,147			23,480	50,641	74,121		

SAVINGS SUMMARY

Building ID	kWh Savings	Thermal Savings	Thermal Safety Factor	Electric Safety Factor
	kWh	Therms	%	%
Howell Road ES	10,588	14,741	0.0%	0.0%
James A. Dever ES	5,641	12,655	0.0%	0.0%
Wheeler Avenue ES	12,251	8,786	0.0%	0.0%
Willow Road ES	11,585	14,047	0.0%	0.0%
Subtotal	40,065	50,229		

Exhibit G-5 - CO #1

Valley Stream UFSD 13
 Exhibit G-5 Chart
 Boiler Efficiency Spreadsheet

*Inputs are blue

Add Controlink ECM savings to Boiler Upgrades

N

*Automatic Mechanical List pull-in colored purple

EXISTING												
Building	Equipment Label	Qty	Location	Boiler(s) Replaced [Y/N]	Add Burner Controls (Y/N)	Existing Fuel	Manufacturer	Model No.	Total Input Capacity [MBH]	Heating Medium	Combustion Efficiency	Percentage of Building Served
Howell Road ES	HRES Boilers	3	Boiler Room	N	N	Natural Gas	Weil McLain	88 Series 2 - 1088	9,246	Steam	83%	100%
James A. Dever ES	JADES Boilers	2	Boiler Room	N	N	Natural Gas	Weil McLain	88 Series 2 - 1588	9,618	Steam	83%	100%
Wheeler Avenue ES	WAES Boilers	3	Boiler Room	N	N	Natural Gas	Weil McLain	88 Series 2 - 1088	9,246	Steam	83%	100%
Willow Road ES	WRES Boilers	3	Boiler Room	N	N	Natural Gas	Weil McLain	88 Series 2 - 1088	9,246	Steam	83%	100%
Totals		11							37,356			

Valley Stream UFSD 13
 Exhibit G-5 Chart
 Boiler Efficiency Spreadsheet

EXISTING OVERALL BOILER EFFICIENCY

Building	Howell Road ES	James A. Dever ES	Wheeler Avenue ES	Willow Road ES
Location	Boiler Room	Boiler Room	Boiler Room	Boiler Room
Label	HRES Boilers	JADES Boilers	WAES Boilers	WRES Boilers
Capacity [MBTU/Hr]	9,246	9,618	9,246	9,246
Quantity	3	2	3	3
Existing Fuel	Natural Gas	Natural Gas	Natural Gas	Natural Gas
Percentage of Building Load [%]	100%	100%	100%	100%
Heating Medium	Steam	Steam	Steam	Steam
Combustion Efficiency [%]	83.0%	83.0%	83.0%	83.0%
Losses Due to Radiation [% of MCR]	1.0%	1.0%	1.0%	1.0%
Losses Due to Blowdown [% of MCR]	1.5%	1.5%	1.5%	1.5%
MCR of Boilers [MMBTU/Hr]	9.2	9.6	9.2	9.2
% Makeup Water [%]	8.0%	8.0%	8.0%	8.0%
Makeup T.D.S. [PPM]	80	80	80	80
Blowdown T.D.S. [PPM]	3,500	3,500	3,500	3,500
Annual Boiler Usage [MMBTU]	5,681	4,714	3,381	4,881
Feedwater Temperature [°F]	180	180	180	180
Condensate Return Temperature [°F]	200	200	200	200
Makeup Water Temperature [°F]	60	60	60	60
Hours of Operation [Hrs/Yr]	4,016	4,016	4,016	4,016
Blowdown Temperature [°F]	220	220	220	220
Heat Required to Raise a lb of Steam [BTU/lb]	980	980	980	980
Boiler Load Rate [%]	50.0%	50.0%	50.0%	50.0%
Present Blowdown Rate [lbs/lb Steam]	0.0018	0.0018	0.0018	0.0018
Heat Content of Blowdown [BTU/lb]	160	160	160	160
Blowdown Loss [%]	2.5%	2.5%	2.5%	2.5%
Radiation Losses [%]	2.0%	2.0%	2.0%	2.0%
Overall Boiler Efficiency [%]	78.5%	78.5%	78.5%	78.5%

Valley Stream UFSD 13
 Exhibit G-5-6
 ECM 6 - Building Management System Upgrades
 Plug Load Controls - Summary

CALCULATION SUMMARY

	Howell Road ES	James A. Dever ES	Wheeler Avenue ES	Willow Road ES
Include BERT Savings	Y	Y	Y	Y
# of BERTS	81	41	75	84
BERT Savings [kWh]	10,588	5,641	12,251	11,585
Electric Safety Factor [%]	0%	0%	0%	0%
Total Electric Savings [kWh]	10,588	5,641	12,251	11,585

SAVINGS SUMMARY

Building ID	kWh Savings kWh	Electric Safety Factor %
Howell Road ES	10,588	0.0%
James A. Dever ES	5,641	0.0%
Wheeler Avenue ES	12,251	0.0%
Willow Road ES	11,585	0.0%
Subtotal	40,065	

Exhibit G-5 - CO #1

Valley Stream UFSD 13
 Exhibit G-5-6
 ECM 6 - Building Management System Upgrades
 Plug Load Controls

Howell Road ES

Equipment	Number of Berts	Total Number of Devices	Typical Use, Hours / Week	Off Time Hours (Weekdays)	Off Time Hours (Weekends)	Parasitic Load Watts	Months / Year	Monthly kWh w/ Out Bert	Yearly kWh w/ Out Bert	Monthly kWh With Bert	Yearly kWh With Bert	Annual kWh Savings
Projector	1	1	168	13	24	10	12	7	87	2	29	59
Projector/Smartboard Combo	32	32	168	13	24	20	12	466	5,591	153	1,830	3,761
Small Printer	2	2	168	13	24	10	12	15	175	5	57	118
Medium Printer/Copier	32	32	168	13	24	25	12	582	6,989	191	2,288	4,701
Large Printer/Copier	2	2	168	13	24	60	12	87	1,048	29	343	705
TV Monitors	5	5	168	13	24	20	12	73	874	24	286	588
Hot/Cold Water Dispensers	1	1	168	13	24	50	12	36	437	12	143	294
SUB TOTAL	75	75						1,267	15,201	415	4,976	10,224

James A. Dever ES

Equipment	Number of Berts	Total Number of Devices	Typical Use, Hours / Week	Off Time Hours (Weekdays)	Off Time Hours (Weekends)	Parasitic Load Watts	Months / Year	Monthly kWh w/ Out Bert	Yearly kWh w/ Out Bert	Monthly kWh With Bert	Yearly kWh With Bert	Annual kWh Savings
Projector	1	1	168	13	24	10	12	7	87	2	29	59
Projector/Smartboard Combo	31	31	168	13	24	20	12	451	5,416	148	1,773	3,643
Large Printer/Copier	3	3	168	13	24	60	12	131	1,572	43	515	1,058
TV Monitors	5	5	168	13	24	20	12	73	874	24	286	588
Hot/Cold Water Dispenser	1	1	168	13	24	50	12	36	437	12	143	294
SUB TOTAL	41	41						699	8,387	229	2,746	5,641

Wheeler Avenue ES

Equipment	Number of Berts	Total Number of Devices	Typical Use, Hours / Week	Off Time Hours (Weekdays)	Off Time Hours (Weekends)	Parasitic Load Watts	Months / Year	Monthly kWh w/ Out Bert	Yearly kWh w/ Out Bert	Monthly kWh With Bert	Yearly kWh With Bert	Annual kWh Savings
Projector/Smartboard Combo	35	35	168	13	24	20	12	510	6,115	167	2,002	4,113
Medium Printer/Copier	35	35	168	13	24	25	12	637	7,644	209	2,503	5,142
Large Printer/Copier	2	2	168	13	24	60	12	87	1,048	29	343	705
Soda Vending	1	1	168	13	24	350	12	255	3,058	83	1,001	2,057
TV Monitors	2	2	168	13	24	20	12	29	349	10	114	235
SUB TOTAL	75	75						1,518	18,215	497	5,963	12,251

Willow Road ES

Equipment	Number of Berts	Total Number of Devices	Typical Use, Hours / Week	Off Time Hours (Weekdays)	Off Time Hours (Weekends)	Parasitic Load Watts	Months / Year	Monthly kWh w/ Out Bert	Yearly kWh w/ Out Bert	Monthly kWh With Bert	Yearly kWh With Bert	Annual kWh Savings
Projector/Smartboard Combo	36	36	168	13	24	20	12	524	6,290	172	2,059	4,231
Medium Printer/Copier	39	39	168	13	24	25	12	710	8,518	232	2,789	5,729
Large Printer/Copier	3	3	168	13	24	60	12	131	1,572	43	515	1,058
TV Monitors	3	3	168	13	24	20	12	44	524	14	172	353
SUB TOTAL	81	81						1,409	16,904	461	5,534	11,370

Exhibit G-5 - CO #1

Valley Stream UFSD 13
 Exhibit G-5-6
 ECM 6 - Building Management System Upgrades
 Plug Load Controls

	Number of Berts	Total Number of Devices					Monthly kWh w/ Out Bert	Yearly kWh w/ Out Bert	Monthly kWh With Bert	Yearly kWh With Bert	Annual kWh Savings
GRAND TOTAL	272	272					4,892	58,706	1,602	19,219	39,487

Exhibit G-5 - CO #1

Valley Stream UFSD 13
 Exhibit G-5 Chart
 Window AC Unit Controls Chart

EXISTING							
Building	Equipment Label	Qty	Controls (Y/N)	Manufacturer	Area Served	Total Capacity [Tons]	Existing EER
Howell Road ES	HRES AC	6	Y	Various	Various	9.0	8.0
Willow Road ES	WRES AC	3	Y	Various	Various	4.5	8.0
Totals		9				13.5	

PROPOSED			
Manufacturer	Qty	Total Capacity [Tons]	Proposed EER
Various	6	9.0	8.0
Various	3	4.5	8.0
	9	13.5	

EXISTING WINDOW AC UNIT SPECIFICATIONS

	Howell Road ES	Willow Road ES
Building	Howell Road ES	Willow Road ES
Label	HRES AC	WRES AC
Area Serving	Various	Various
Quantity	6	3
Total Capacity [Tons]	9.0	4.5
Existing EER	8.0	8.0

PROPOSED WINDOW AC UNIT SPECIFICATIONS

	Howell Road ES	Willow Road ES
Window AC Unit Controls	Y	Y
Label	HRES AC	WRES AC
Area Serving	Various	Various
Quantity	6	3
Total Capacity [Tons]	9.0	4.5
Proposed EER	8.0	8.0

Valley Stream UFSD 13
Exhibit G-5-6
ECM 6 - Building Management System Upgrades
Plug Load Controls - Window A/C Units

ECM DESCRIPTION

Install wireless control units to schedule existing window AC units and ensure they are shut off when the space is unoccupied

DATA / ASSUMPTIONS

*Run Hours based on occupancy schedule

*Full Load is estimated at (unless stated otherwise) :

92.5 °F

COMMISSIONING

Ensure controls have been properly installed and scheduled

RECOVERY/SAFETY FACTOR

Electric Safety Factor [%] =

0%

FORMULAE

$$W_{SAVINGS} = W_{C-EXT} - W_{C-PRP}$$

$$W_{C-EXT} = \sum_{60}^{105} [((C \cdot (T_{BIN} - T_{UNOCC}) / (T_{BIN} - T_{DESIGN}) \cdot t_{UNOCC}) + (C \cdot (T_{BIN} - T_{OCC}) / (T_{BIN} - T_{DESIGN}) \cdot t_{OCC})) \cdot (12 / \eta_{EXT})]$$

$$W_{C-PRP} = \sum_{60}^{105} [((C \cdot (T_{BIN} - T_{OCC}) / (T_{BIN} - T_{DESIGN}) \cdot t_{OCC})) \cdot (12 / \eta_{PRP})]$$

Variable	Units	Description
$W_{SAVINGS}$	kWh	Electrical Savings
W_{C-EXT}	kWh	Existing window AC unit Consumption
W_{C-PRP}	kWh	Proposed window AC unit Consumption
\sum_{60}^{105}	-	Summation of all bins from 60°F to 105°F
C	Ton	Tonnage of window AC units
η_{EXT}	-	Existing efficiency of window AC unit (EER)
η_{PRP}	-	Proposed efficiency of window AC unit (EER)
T_{DESIGN}	°F	Cooling design temperature
T_{BIN}	°F	Bin temperature
T_{OCC}	°F	Temperature of building during occupied hours
T_{UNOCC}	°F	Temperature of building during unoccupied hours
t_{OCC}	Hrs	Occupied Bin Hours in respective temperature bin
t_{UNOCC}	Hrs	Unoccupied Bin Hours in respective temperature bin

Exhibit G-5 - CO #1

Valley Stream UFSD 13
 Exhibit G-5-6
 ECM 6 - Building Management System Upgrades
 Plug Load Controls - Window A/C Units

* Inputs are in blue

Building	Label	Total Tonnage	Current EER	Proposed EER	Area Serving
Howell Road ES	HRES AC	9.0	8.0	8.0	Various
Willow Road ES	WRES AC	4.5	8.0	8.0	Various
Totals		13.5			

CALCULATIONS

	Howell Road ES	Willow Road ES
Label	HRES AC	WRES AC
Area Serving	Various	Various
Window AC Unit Capacity [Tons]	9.0	4.5
Existing EER	8.0	8.0
Proposed EER	8.0	8.0
Proposed Occupied Cooling Setpoint [°F]	74.0	74.0
Proposed Unoccupied Cooling Setpoint [°F]	85.0	85.0
Existing Window AC Unit Consumption [kWh]	2,952	1,354
Proposed Window AC Unit Consumption [kWh]	2,588	1,140
Electric Savings [kWh]	364	215
Electric Safety Factor [%]	0%	0%
Electric Savings [kWh]	364	215

HOWELL ROAD ES

Amb. Temp Bin [°F]	Avg Temp [°F]	01-08 Hours	09-16 Hours	17-24 Hours	Total Bin Hours	Occup. Bin Hours	Unocc. Bin Hours	Occupied Tons	Unoccupied Tons	Occupied Ton-Hrs	Unoccupied Ton-Hrs	Existing Window AC Unit Consumption [kWh]	Proposed Window AC Unit Consumption [kWh]	Electrical Savings [kWh]
COOLING														
100 to 105	102.5	-	-	-	-	-	-	9.0	9.0	-	-	-	-	-
95 to 100	97.5	-	3	-	3	2	1	9.0	9.0	18	9	41	27	13
90 to 95	92.5	-	18	3	21	12	9	9.0	9.0	108	81	284	163	121
85 to 90	87.5	-	100	18	118	67	51	6.6	3.0	440	153	889	660	230
80 to 85	82.5	37	292	126	455	197	258	4.1	-	815	-	1,223	1,223	-
75 to 80	77.5	189	289	247	725	202	523	1.7	-	344	-	516	516	-
70 to 75	72.5	275	200	270	745	146	599	-	-	-	-	-	-	-
65 to 70	67.5	236	184	245	665	134	531	-	-	-	-	-	-	-
60 to 65	62.5	232	158	196	586	116	470	-	-	-	-	-	-	-
Total		969	1,244	1,105	3,318	876	2,442	39.4	30.0	1,726	243	2,952	2,588	364

Exhibit G-5 - CO #1

Valley Stream UFSD 13

Exhibit G-5-6

ECM 6 - Building Management System Upgrades

Plug Load Controls - Window A/C Units

WILLOW ROAD ES

Amb. Temp Bin [°F]	Avg Temp [°F]	01-08 Hours	09-16 Hours	17-24 Hours	Total Bin Hours	Occup. Bin Hours	Unocc. Bin Hours	Occupied Tons	Unoccupied Tons	Occupied Ton-Hrs	Unoccupied Ton-Hrs	Existing Window AC Unit Consumption [kWh]	Proposed Window AC Unit Consumption [kWh]	Electrical Savings [kWh]
COOLING														
100 to 105	102.5	-	-	-	-	-	-	4.5	4.5	-	-	-	-	-
95 to 100	97.5	-	3	-	3	2	1	4.5	4.5	8	6	20	12	8
90 to 95	92.5	-	18	3	21	10	11	4.5	4.5	47	47	142	71	71
85 to 90	87.5	-	100	18	118	58	60	3.3	1.5	191	90	421	286	135
80 to 85	82.5	37	292	126	455	173	282	2.1	-	357	-	536	536	-
75 to 80	77.5	189	289	247	725	185	540	0.9	-	157	-	236	236	-
70 to 75	72.5	275	200	270	745	141	604	-	-	-	-	-	-	-
65 to 70	67.5	236	184	245	665	128	537	-	-	-	-	-	-	-
60 to 65	62.5	232	158	196	586	112	474	-	-	-	-	-	-	-
Total		969	1,244	1,105	3,318	808	2,510	19.7	15.0	760	143	1,354	1,140	215

Valley Stream UFSD 13
Exhibit G-5-7
ECM 7 - Desktop Computer Power Management

ECM DESCRIPTION

Install a centralized computer power management software to control desktop computers and reduce power consumption when not in use.

DATA / ASSUMPTIONS

- * Annual Savings for Student Computers [kWh]

83

- * Annual Savings for Administrative Computers [kWh]

83

- * Note, annual savings based on weighted average of desktop and laptop computer savings from actual software data collection demo

	On	Sleep Mode
* Average CRT Monitor Load [W]	70	15
* Average LCD Monitor Load [W]	18	5

*Annual Savings for Administrative Computers and Student Computers are based on previous logging results for computers with similar usage types

COMMISSIONING

Verify the software has been properly installed and is functioning as designed

RECOVERY/SAFETY FACTOR

Electric Safety Factor [%] =

0%

FORMULAE

$$W_{TOTAL} = W_{CPU} + W_{LCD}$$

$$W_{CPU} = (CPU_{STUDENT} \cdot S_{STUDENT}) + (CPU_{ADMIN} \cdot S_{ADMIN})$$

Variable	Units	Description
W_{TOTAL}	kWh	Total Electrical Savings associated with this measure
W_{CPU}	kWh	Electrical Savings associated with computer control
$CPU_{STUDENT}$	-	Numbers of Student Computers
CPU_{ADMIN}	-	Number of Admin Computers
$S_{STUDENT}$	kWh	Annual Student Computer Savings (Estimated)
S_{ADMIN}	kWh	Annual Admin Computer Savings (Estimated)

Exhibit G-5 - CO #1

Valley Stream UFSD 13

Exhibit G-5-7

ECM 7 - Desktop Computer Power Management

* Inputs are in blue

Building	# of Student Computers	# of Administrative Computers
Howell Road ES	120	13
James A. Dever ES	123	13
Wheeler Avenue ES	117	12
Willow Road ES	107	11
Totals	467	49

CALCULATIONS

	Howell Road ES	James A. Dever ES	Wheeler Avenue ES	Willow Road ES
Number of Student Computers	120	123	117	107
Number of Administrative Computers	13	13	12	11
Total Number of Computers	133	136	129	118
Computer Electric Savings [kWh]	11,039	11,288	10,707	9,794
Total Electric Savings [kWh]	11,039	11,288	10,707	9,794
Electric Safety Factor [%]	0%	0%	0%	0%
Total Electric Savings [kWh]	11,039	11,288	10,707	9,794

SAVINGS SUMMARY

Building ID	kWh Savings	Electric Safety Factor
	kWh	%
Howell Road ES	11,039	0.0%
James A. Dever ES	11,288	0.0%
Wheeler Avenue ES	10,707	0.0%
Willow Road ES	9,794	0.0%
Subtotal	42,828	

Exhibit G-5 - CO #1

Valley Stream UFSD 13
 Exhibit G-5-8
 ECM 8 - Install Solar Photovoltaic Systems

ECM DESCRIPTION

Install solar photovoltaic systems to generate clean, renewable energy. Any excess energy produced above adjusted building consumption levels will be remote net metered.

DATA / ASSUMPTIONS

Demand Diversity Factor [%] =

Various

*Savings modeled using HelioScope design software, and corroborated with NREL's PVWatts software

**Excess solar generation is converted to a dollar credit using the host site's kWh rate. This dollar credit can then be applied to non-generating (i.e. without solar PV) site accounts and used to pay down any outstanding electrical utility costs (consumption, demand, misc. charges. etc.). This dollar credit is carried within the workbook as an O&M dollar savings.

COMMISSIONING

Test installed system - measuring the output and verify with calculations for weather conditions. Verify all electrical connections and tie-ins to the grid and the building power.

RECOVERY/SAFETY FACTOR

Electric Safety Factor [%] =

7%

FORMULAE

$$W_{PV} = \sum_{Jan}^{Dec} [P_{DC} \cdot G_{AC}]$$

Variable	Units	Description
W_{PV}	kWh	Total electrical AC energy produced by PV system
\sum_{Jan}^{Dec}	-	Summation of months
P_{DC}	kW	DC power rating of proposed PV system
DR	%	AC to DC conversion de-rate factor (entered into NREL PVWatts software)
$A_{\%}$	%	Efficiency gain with axis tracking system (entered into NREL PVWatts software)
G_{AC}	kWh	AC energy generated per kW of PV system (output of NREL PVWatts software)

Exhibit G-5 - CO #1

Valley Stream UFSD 13
 Exhibit G-5-8
 ECM 8 - Install Solar Photovoltaic Systems

* Inputs are in blue

Building	DC Rating of System [kW]	AC Rating of System [kW]	Include System [Y/N]	System Type
Howell Road ES	213.2	166.5	Y	Roof Mount
James A. Dever ES	214.2	167.0	Y	Roof Mount
Willow Road ES	213.9	166.5	Y	Roof Mount
Totals	641.3			

PSEG Remote Net Metering \$ Credit Rate Analysis*				
Month	Fuel & Purchased Power Charge	Energy Charge	Efficiency & Renewable Charge	Total
Jul-14	\$ 0.0678	\$ 0.0569	\$ 0.0035	\$ 0.1282
Aug-14	\$ 0.0596	\$ 0.0569	\$ 0.0035	\$ 0.1200
Sep-14	\$ 0.0737	\$ 0.0569	\$ 0.0035	\$ 0.1341
Oct-14	\$ 0.0935	\$ 0.0420	\$ 0.0035	\$ 0.1390
Nov-14	\$ 0.1070	\$ 0.0420	\$ 0.0035	\$ 0.1525
Dec-14	\$ 0.1051	\$ 0.0420	\$ 0.0035	\$ 0.1506
Jan-15	\$ 0.1037	\$ 0.0420	\$ 0.0035	\$ 0.1492
Feb-15	\$ 0.0918	\$ 0.0420	\$ 0.0035	\$ 0.1373
Mar-15	\$ 0.0775	\$ 0.0420	\$ 0.0035	\$ 0.1230
Apr-15	\$ 0.0603	\$ 0.0439	\$ 0.0024	\$ 0.1067
May-15	\$ 0.0705	\$ 0.0439	\$ 0.0024	\$ 0.1168
Jun-15	\$ 0.0633	\$ 0.0588	\$ 0.0024	\$ 0.1246
12 Month Average	\$ 0.0812	\$ 0.0474	\$ 0.0032	\$ 0.1318

*Excess solar PV production is converted to a dollar credit based on the host site rate components in the table above. This credit is then used to pay down the host site bill for any remaining charges (kW, meter costs, misc. costs, etc.). Any remaining credit can then be applied to satellite locations and be used to pay down that site's electric bill

Exhibit G-5 - CO #1

Valley Stream UFSD 13

Exhibit G-5-8

ECM 8 - Install Solar Photovoltaic Systems

CALCULATIONS

	Howell Road ES	James A. Dever ES	Willow Road ES
DC Rating of System [kW]	213.2	214.2	213.9
AC Rating of System [kW]	166.5	167.0	166.5
Include System [Y/N]	Y	Y	Y
Annual Demand Savings [kW]	109.0	108.0	90.7
Total kWh AC per year Generated [kWh]	264,644	264,367	264,104
Electric Safety Factor [%]	7%	7%	7%
Demand Diversity Factor [%]	88%	88%	90%
Baseline Electric Consumption [kWh]	240,120	238,500	197,520
Savings from Non-Solar PV ECMs [kWh]	81,084	74,481	74,039
Adjusted Baseline Consumption [kWh]	159,036	164,019	123,481
Excess Solar PV Production [Y/N]	Y	Y	Y
Annual Excess Production [kWh]	105,608	100,347	140,622
Excess Solar Production Credit Rate [\$/kWh]	\$ 0.1318	\$ 0.1318	\$ 0.1318
Excess Solar Production Credit Derate [%]	0%	0%	0%
Total Excess Solar Production Credit [\$]	\$ 13,923	\$ 13,229	\$ 18,539
Host Site Remaining Electric Cost after EPC [\$]	\$ 7,866	\$ 8,158	\$ 6,351
Host Site Excess Solar Production Credit [\$]	\$ 7,866	\$ 8,158	\$ 6,351
Remaining Excess Solar PV Production Credit [\$]	\$ 6,057	\$ 5,072	\$ 12,188

Satellite Site 1	Wheeler Avenue ES	Wheeler Avenue ES	Wheeler Avenue ES
% Excess Credit Split for Satellite Site 1 [%]	100%	100%	100%
Satellite Site 1 Remaining Electric Cost after EPC [\$]	\$ 23,317	\$ 23,317	\$ 23,317
Excess Generation Satellite Site 1 Credit [\$]	\$ 6,057	\$ 5,072	\$ 12,188

Monthly Electric Demand Savings [kW]	8.5	8.4	7.1
Electric Consumption Savings [kWh]	148,438	153,090	115,253

Exhibit G-5 - CO #1

Valley Stream UFSD 13

Exhibit G-5-8

ECM 8 - Install Solar Photovoltaic Systems

Building Howell Road ES

Type: Roof Mount

AC System Size [kW] 166.5

Month	Solar PV System Production [kWh]	Days per Month	Peak Sun Hours per Day	Solar PV Production [kW]	Demand Savings [kW]
January	10,698	31	8	43.1	5.2
February	15,288	28	8	68.3	8.2
March	22,262	31	9	79.8	9.6
April	24,920	30	9	92.3	11.1
May	30,370	31	10	98.0	11.8
June	30,970	30	10	103.2	12.4
July	30,895	31	11	90.6	10.9
August	32,280	31	11	94.7	11.4
September	23,064	30	10	76.9	9.2
October	21,690	31	10	70.0	8.4
November	12,549	30	8	52.3	6.3
December	9,658	31	8	38.9	4.7

Building James A. Dever ES

Type: Roof Mount

AC System Size [kW] 167.0

Month	Solar PV System Production [kWh]	Days per Month	Peak Sun Hours per Day	Solar PV Production [kW]	Demand Savings [kW]
January	10,504	31	8	42.4	5.0
February	15,101	28	8	67.4	8.0
March	22,325	31	9	80.0	9.5
April	24,946	30	9	92.4	11.0
May	30,487	31	10	98.3	11.7
June	31,279	30	10	104.3	12.4
July	31,046	31	11	91.0	10.8
August	32,424	31	11	95.1	11.3
September	22,964	30	10	76.5	9.1
October	21,571	31	10	69.6	8.3
November	12,269	30	8	51.1	6.1
December	9,453	31	8	38.1	4.5

Exhibit G-5 - CO #1

Valley Stream UFSD 13

Exhibit G-5-8

ECM 8 - Install Solar Photovoltaic Systems

Building Willow Road ES

Type: Roof Mount

AC System Size [kW] 166.5

Month	Solar PV System Production [kWh]	Days per Month	Peak Sun Hours per Day	Solar PV Production [kW]	Demand Savings [kW]
January	10,770.5	31	8	43.4	4.3
February	15,377.7	28	8	68.7	6.9
March	22,145.4	31	9	79.4	7.9
April	24,677.1	30	9	91.4	9.1
May	29,985.0	31	10	96.7	9.7
June	30,819.1	30	10	102.7	10.3
July	30,832.0	31	11	90.4	9.0
August	32,304.3	31	11	94.7	9.5
September	23,059.9	30	10	76.9	7.7
October	21,809.3	31	10	70.4	7.0
November	12,540.9	30	8	52.3	5.2
December	9,782.5	31	8	39.4	3.9

SAVINGS SUMMARY

Building ID	kWh Savings	kW Savings	Electric Safety Factor
	kWh	kW	%
Howell Road ES	148,438	8.5	6.7%
James A. Dever ES	153,090	8.4	6.7%
Wheeler Avenue ES	-	-	0.0%
Willow Road ES	115,253	7.1	6.7%
Subtotal	416,781	23.9	

Exhibit G-5 - CO #1

Valley Stream UFSD 13

Exhibit G-5-8

ECM 8 - Install Solar Photovoltaic Systems

Solar PV Balance

ECM DESCRIPTION

Install solar photovoltaic systems to generate clean, renewable energy. Any excess energy produced above adjusted building consumption levels will be net metered and applied to other facilities within the District.

CALCULATIONS

DEMAND kW					
Month	Howell Road ES	James A. Dever ES	Wheeler Avenue ES	Willow Road ES	TOTAL
June	86.5	102.5	78.0	70.5	337.5
May	84.0	92.0	73.0	83.0	332.0
April	75.5	74.0	72.0	83.0	304.5
March	78.0	74.0	78.0	72.0	302.0
February	87.5	77.5	75.5	62.5	303.0
January	86.5	141.5	75.5	61.0	364.5
December	82.0	74.0	75.5	61.0	292.5
November	82.0	70.5	74.5	66.0	293.0
October	83.0	88.0	74.5	57.0	302.5
September	87.5	93.5	79.0	63.0	323.0
August	75.5	84.0	70.5	57.0	287.0
July	80.5	92.0	75.5	81.5	329.5
Baseline kW	988.5	1,063.5	901.5	817.5	3,771.0
ESPC kW Savings	267.4	268.4	263.3	225.0	1,024.1
Adj. Baseline kW	721.1	795.1	638.2	592.5	2,746.9
Lowest Monthly Baseline kW	75.5	70.5	70.5	57.0	287.0
Proposed Monthly Lighting kW	19.1	25.3	20.7	18.3	83.4
Monthly Solar PV Savings kW	8.5	8.4	-	7.1	23.9
Monthly Balance Post Solar PV kW	67.0	62.1	70.5	49.9	249.6
Demand Balance Satisfied	Y	Y	Y	Y	Y
Annual Solar PV Savings kW	101.7	100.8	-	84.6	287.1
% of Adj. Baseline	14.1%	12.7%	0.0%	14.3%	10.5%

Exhibit G-5 - CO #1

Valley Stream UFSD 13
 Exhibit G-5-8
 ECM 8 - Install Solar Photovoltaic Systems
 Solar PV Balance

CONSUMPTION kWh					
Month	Howell Road ES	James A. Dever ES	Wheeler Avenue ES	Willow Road ES	TOTAL
June	19,680	19,620	17,040	12,840	69,180
May	21,120	20,700	16,680	19,920	78,420
April	17,280	23,220	19,920	15,600	76,020
March	24,480	20,700	19,080	16,320	80,580
February	23,640	16,920	21,960	20,520	83,040
January	24,600	22,320	20,400	13,800	81,120
December	23,040	16,740	19,440	17,040	76,260
November	23,040	18,540	17,880	14,640	74,100
October	19,320	17,820	18,840	16,800	72,780
September	20,640	25,020	14,640	15,120	75,420
August	9,480	14,040	8,520	18,000	50,040
July	13,800	22,860	11,040	16,920	64,620
Baseline kWh	240,120	238,500	205,440	197,520	881,580
ESPC kWh Savings	81,084	74,481	85,447	74,039	315,051
Adj. Baseline kWh	159,036	164,019	119,993	123,481	566,529
Solar PV Savings kWh	148,438	153,090	-	115,253	416,781
% of Adj. Baseline	93.3%	93.3%	0.0%	93.3%	73.6%

TOTAL ELECTRIC COST					
Month	Howell Road ES	James A. Dever ES	Wheeler Avenue ES	Willow Road ES	TOTAL
June	\$ 3,465	\$ 3,387	\$ 3,048	\$ 2,391	\$ 12,291
May	\$ 3,302	\$ 3,106	\$ 2,561	\$ 3,631	\$ 12,600
April	\$ 2,911	\$ 3,902	\$ 3,437	\$ 2,833	\$ 13,084
March	\$ 4,231	\$ 3,632	\$ 3,432	\$ 2,442	\$ 13,737
February	\$ 4,376	\$ 3,247	\$ 4,220	\$ 3,440	\$ 15,283
January	\$ 4,695	\$ 4,405	\$ 4,069	\$ 2,460	\$ 15,630
December	\$ 4,374	\$ 3,192	\$ 3,676	\$ 3,299	\$ 14,541
November	\$ 4,049	\$ 3,224	\$ 3,172	\$ 3,016	\$ 13,460
October	\$ 3,183	\$ 2,944	\$ 3,150	\$ 3,112	\$ 12,389
September	\$ 3,665	\$ 4,374	\$ 2,643	\$ 2,637	\$ 13,319
August	\$ 2,018	\$ 2,742	\$ 2,022	\$ 2,829	\$ 9,612
July	\$ 3,109	\$ 4,625	\$ 2,549	\$ 2,956	\$ 13,239
Baseline Total Cost	\$ 43,378	\$ 42,781	\$ 37,978	\$ 35,048	\$ 159,185
ESPC Total \$ Savings	\$ 35,512	\$ 34,623	\$ 14,661	\$ 28,697	\$ 113,494
Adj. Baseline Total Cost	\$ 7,866	\$ 8,158	\$ 23,317	\$ 6,351	\$ 45,691
Excess Solar Export \$ Credit	\$ 7,866	\$ 8,158	\$ 23,317	\$ 6,351	\$ 45,691
% of Adj. Baseline	100.0%	100.0%	100.0%	100.0%	100.0%

EXHIBIT G-6 – CO #1
OPERATIONS COST AVOIDANCE METHODOLOGY

OSD #1: LED LIGHTING UPGRADE – O&M COST AVOIDANCE

- 1. Description and Connection to Scope of Work:** Attachment A, ECM 1 describes Honeywell’s scope of work for implementing a comprehensive LED lighting upgrades throughout the District.
- 2. Operational Cost Baseline:** Lighting related expenditures fall under Operations and Maintenance. The baseline is assumed and calculated to be the Mean Time Between Failures (MTBF) of the existing luminaries.
- 3. Operational Cost Conservation Methodology:** The new LED lighting fixtures and retrofit kits being installed have a longer material life than the standard existing equipment. This translates into a longer Mean Time Between Failures (MTBF) thus resulting in a longer timeframe between equipment replacement periods.
- 4. Determination of Operational Costs Avoided:** Operational cost reductions were calculated based on the quantity of lamps and ballasts being replaced, and the average life expectancy of the existing and proposed equipment. **The savings are agreed to be \$4,386/yr.**

OSD #2: REPLACE AIR HANDLING UNIT – O&M COST AVOIDANCE

- 1. Description and Connection to Scope of Work:** Attachment A, ECM 2 describes Honeywell’s scope of work for installing new air handling units at the Howell Road Elementary School.
- 2. Determination of Operational Costs Avoided:** Operational cost savings are a result of a reduction in the District’s current repair dollar spend on the existing equipment. **The savings are agreed to be \$1,230/yr.**

OSD #3: BUILDING MANAGEMENT SYSTEM UPGRADES – O&M COST AVOIDANCE

- 1. Description and Connection to Scope of Work:** Attachment A, ECM 6 describes Honeywell’s scope of work for implementing a Building Management System upgrades throughout the District.
- 2. Determination of Operational Costs Avoided:** For the elimination of providing JACE license upgrades District-wide to match each and every PC JAVA upgrade implemented by their IT Department. Furthermore, the open protocol, open license, N4 JACE panels afford the District more cost effective preventive maintenance through competitive procurement amongst several authorized dealers. **This savings are agreed to be \$10,696/yr.**