HONEYWELL
AGREEMENT

CUSTOMER NAME:	ROOSEVELT UFSD
HONEYWELL PROPOSAL NUMBER:	RUFSD121422
DATE OF SUBMISSION:	12-14-22
VALIDITY PERIOD:	01-31-23

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ARTICLE 1
GENERAL PROVISIONS

1.1 This Agreement, including all attachments, exhibits, and schedules referenced herein (hereinafter the "Agreement") is made by and between Honeywell International Inc. ("Honeywell"), a Delaware Corporation, acting through its Honeywell Building Technologies business unit, with a principal place of business at 715 Peachtree Street N.E., Atlanta, GA 30308, and Roosevelt Union Free School District, 240 Denton Place, Roosevelt, New York 11575 ("Customer," and together with Honeywell, the "Parties"). The Agreement is effective as of the date of the later signature of the respective Parties (the "Effective Date").

1.2 As used in this Agreement, the term "Work" means the construction and services required by the Contract Documents (as defined below), whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by Honeywell to fulfill Honeywell's obligations, as described in Attachment A, and otherwise set forth in the Contract Documents. The "Contract Documents" consist of this Agreement, its attachments, exhibits, schedules, and addenda. The Work may constitute the whole or a part of the Project. The "Project" is the total construction of which the Work performed by HONEYWELL under this Agreement may be the whole or a part. The Work specifically excludes certain design and construction relating to the Project, which are the subject of separate agreements between Customer and parties other than Honeywell.

1.3 "Support Services" means those services and obligations to be undertaken by HONEYWELL in support of CUSTOMER as set forth in Attachment D – Guarantee and Support Services Agreement.

1.4 Engineer of Record: The District has identified ECG Engineering, P.C. as the Engineer of Record to provide architectural and engineering services in connection with the Work to be performed by Honeywell. The fees and total compensation for such Engineering Services shall be $1,111,905 and shall be paid for by Honeywell. Honeywell shall indemnify and hold the Customer harmless from any and all claims made against the Customer by the Engineer of Record for fees for Engineering Services provided hereunder. Both Honeywell and Customer agree and acknowledge that the Engineer of Record owes its/his/her professional obligations and duties, including duties of care, to the Customer. The Engineer of Record shall remain free from any financial interest in the Agreement which conflicts with the proper completion of its/his responsibilities under this Agreement and which conflicts with its/his responsibilities and duties to the Customer.

1.5 Contract Term. Pursuant to 8 N.Y.C.R.R. §155.20(d) (7) (ii), the contract term shall not exceed 18 years, or the useful life of the equipment being installed, whichever is less. The term for this contract as shown in the Attachment D Guarantee and Support Services Agreement is 18 years.

ARTICLE 2
HONEYWELL'S RESPONSIBILITIES

2.1 HONEYWELL Work

2.1.1 Honeywell shall be responsible for construction/project management of the Work. Honeywell shall provide submittals (including, as applicable, Shop Drawings, Product Data, and Samples, etc.) to ECG Engineering, P.C. to review and approve, reject, or take other appropriate action upon Honeywell's submittals as necessary for ECG Engineering, P.C. to ascertain their conformance with the design's requirements as indicated in the Contract Documents.

2.1.2 Honeywell shall comply with and obtain, at its expense, all licenses and permits required by Federal, State, and local laws, rules, and ordinances in connection with the Work. To the extent this Agreement requires Honeywell to perform operations and/or maintenance of specified ECMs or other equipment, it shall comply with and obtain, at its expense, all licenses and permits which may be required by Federal, State, and local laws, rules, and ordinances in connection with the operation and/or maintenance of such specified ECMs. In the event that Honeywell cannot procure any such license or permit in light of a requirements that Customer is required to do so, Customer will procure the same. Honeywell understands and agrees that this project must be performed in accordance with New York State Labor Law Section 220 et. Seq.

2.2 Responsibilities with Respect to the Work

2.2.1 Honeywell will provide construction supervision, inspection, labor, materials, tools, construction equipment and subcontracted items necessary for the execution and completion of the Work.

2.2.2 Honeywell shall keep the premises in an orderly fashion and free from unnecessary accumulation of waste materials or rubbish caused by its operations. Honeywell acknowledges that Customer is a school district with children of multiple ages and shall ensure that the premises are safe for Customer's students where applicable. If HONEYWELL damages property not needed for the Work, Honeywell shall repair the property to its pre-existing condition unless Customer directs otherwise. In the event repairs are, in Customer's reasonable discretion, impracticable or insufficient to return the property to pre-existing condition, Honeywell shall replace the damaged property. At the completion of the Work, Honeywell shall remove waste material supplied by HONEYWELL under this Agreement as well as all its tools, construction equipment, machinery, and surplus material. Waste shall be disposed of as follows:

(a) Construction Waste and/or Non-hazardous Waste: Construction waste (cardboard, metal, wood crates, plastic, wiring, etc.), and/or non-hazardous waste (non-PCB ballast's, lamps, batteries, etc.), shall be removed offsite by Honeywell or its subcontractors for disposal and/or recycling. The Customer's name and address shall be listed on the shipping documents as the owner/generator of the waste. The transportation of waste materials will meet local regulatory requirements.

(b) Hazardous Waste: If and to the extent Honeywell is responsible for removal of hazardous waste pursuant to the express provisions of the Attachment A Scope of Work, Honeywell or its subcontractors shall contract with a licensed transporter for the removal of the applicable hazardous waste (PCB's, mercury, asbestos, etc.). The Customer's name and address shall be listed on the shipping documents as the owner/generator of the waste. The transportation of waste materials will meet local regulatory requirements.

2.2.3 Honeywell shall give all notices and comply with all laws and ordinances legally enacted as of the date of execution of the Agreement governing the execution of the Work. Provided, however, that Honeywell shall not be responsible nor liable for the violation of any code, law or ordinance caused by Customer or existing in Customer's property prior to the commencement of the Work.

2.2.4 Honeywell shall comply with all applicable federal, state, and municipal laws and regulations that regulate the health and safety of its workers while providing the Work and shall take such measures as required by those laws and regulations to prevent injury and accidents to other persons on, about or adjacent to any Site (as defined in Section 3.8.4). It is understood and agreed, however, that Honeywell shall have no responsibility for elimination or abatement of health or safety hazards created or otherwise resulting from activities at any Site carried on by persons not in a contractual relationship with Honeywell, including Customer, Customer's contractors or subcontractors, Customer's tenants, or Customer's visitors. Customer agrees to cause its contractors, subcontractors, and tenants to comply fully with all applicable federal, state, and municipal laws and regulations governing health and safety and to comply with all reasonable requests and directions of Honeywell for the elimination or abatement of any such health or safety hazards at any Site outside the scope of Honeywell's scope of responsibility**.**

2.2.5 Honeywell assumes responsibility for all injury or destruction of Honeywell's materials, tools, machinery, equipment, appliances, shoring, scaffolding, false and form work, and personal property of Honeywell's employees from whatever cause arises.

2.3 Patent Indemnity

2.3.1
Honeywell shall indemnify and hold harmless Customer, its employees, agents, and assigns against all claims, actions, damages, liabilities, and expenses, including reasonable attorney's fees as determined by court order, arising out of or related to any claims of patent infringement and any claims of construction or materialman's lien made by any subcontractor or materialman. provided that: (a) Customer gives Honeywell reasonably prompt notice in writing of any such suit and permits Honeywell, through counsel of its choice, to answer the charge of infringement and defend such suit; and (b) Customer gives Honeywell all needed information within its possession and reasonable assistance and authority, at Honeywell's expense, to enable Honeywell to defend such suit.

2.3.2 If such a suit has occurred, or in Honeywell's opinion is likely to occur, Honeywell may, at its election and expense: (a) obtain for Customer the right to continue using such hardware; (b) replace, correct, or modify it so that it is not infringing; or (c) remove such hardware and grant Customer a credit therefor, as depreciated.

2.3.3 In the case of a final award of damages in any such suit, Honeywell will pay such award. Honeywell shall not, however, be responsible for any settlement made without its written consent.

2.4 Warranties and Completion

2.4.1 Honeywell warrants Customer good and clear title to all equipment and materials furnished to Customer pursuant to this Agreement (except licensed software, which shall be governed exclusively by the terms and conditions of any applicable Software License Agreement, attached hereto as Attachment B or otherwise provided with the software) free and clear of liens and encumbrances. Honeywell hereby warrants that all such equipment and materials shall be of good quality and shall be free from defects in materials and workmanship, including installation and setup, for a period of two (2) years from the date of execution of the Certificate of Substantial Completion set forth in Exhibit J-2 for the equipment or portion of the Work in question as reasonably determined by the Engineer of Record, provided that no repairs, substitutions, modifications, or additions have been made, except by Honeywell or with Honeywell's written permission, which shall not be unreasonably withheld and provided that after delivery such equipment or materials have not been subjected by non-Honeywell personnel to accident, neglect, misuse, or use in violation of any instructions supplied by Honeywell. Honeywell's sole liability hereunder shall be to repair promptly or replace defective equipment or materials, at Honeywell's option and at Honeywell's expense. The limited warranty contained in this Section 2.4.1 shall constitute the exclusive remedy of Customer and the exclusive liability of Honeywell for any breach of any warranty related to the equipment and materials furnished by Honeywell pursuant to this Agreement.

2.4.2 In addition to the warranty set forth in Section 2.4.1 above, Honeywell shall assign to Customer any and all manufacturer's or installer's warranties for equipment or materials not manufactured by Honeywell and provided as part of the Work, to the extent that such third-party warranties are assignable and extend beyond the two (2) year limited warranty set forth in Section 2.4.1.

2.4.3 THE WARRANTIES SET FORTH HEREIN ARE EXCLUSIVE, AND HONEYWELL EXPRESSLY DISCLAIMS ALL OTHER WARRANTIES, WHETHER WRITTEN OR ORAL, IMPLIED OR STATUTORY, INCLUDING BUT NOT LIMITED TO, ANY WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO THE EQUIPMENT AND MATERIALS PROVIDED HEREUNDER. HONEYWELL SHALL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING FROM, OR RELATING TO, THIS LIMITED WARRANTY OR ITS BREACH.

ARTICLE 3
CUSTOMER'S RESPONSIBILITIES

3.1 Customer shall provide Honeywell full information regarding the requirements for the Work.

3.2 Customer shall designate a representative who shall be fully acquainted with the Work, and who has authority to render decisions that do not impact the scope of the project and/or the price of the project. Honeywell acknowledges, however, that Customer is a municipality and some authority may only come from the Board of Education after the passage of a public resolution by the majority of the Board.

3.3 Customer shall furnish to Honeywell all information regarding legal limitations, utility locations and other information reasonably pertinent to this Agreement, the Work, and the Project.

3.4 To the extent not covered by 2.1.2, Customer shall secure and pay for all necessary approvals, easements, and assessments required for the construction, use or occupancy of permanent structures or for permanent changes in existing facilities, including charges for legal and auditing services.

3.5 If Customer becomes aware of any fault or defect in the Work, it shall give prompt written notice thereof to Honeywell.

3.6 The services and information required by the above paragraphs shall be furnished with reasonable promptness at Customer's expense and Honeywell shall be entitled to rely upon the accuracy and the completeness thereof.

3.7 Pursuant to the Regulations of the Commissioner of Education of the State of New York, Section 155.20(d), this Agreement shall not be executory until approval of the Commissioner of Education is obtained in writing. The Customer's obligations hereunder are contingent upon and subject to prior review and written approval of the New

York State Department of Education ("SED") pursuant to the laws and regulations of the State of New York and is also contingent upon and subject to Customer's securing of financing. This Agreement is NOT binding on the Customer until the Customer has received written approval from SED and until the Customer has secured financing or other means of payment the Customer deems acceptable in its own exclusive discretion. In the event approval of said financing or other means of payment has not been secured by the Customer within 365 days after the latest date on which this Agreement is signed, then this Agreement may be terminated by Customer upon written notice to Honeywell with no further obligation of Customer to HONEYWELL or to any other party. The Agreement may be extended beyond 365 days if such extension is in writing signed by both parties. Upon mutual written agreement by both parties any adjustment or modification to the Agreement as a result of the extension shall be an additional condition precedent.

3.8 HAZARDOUS SUBSTANCES, MOLD, AND UNSAFE WORKING CONDITIONS

3.8.1 "Hazardous Substance" includes, but is not limited to, all of the following, whether naturally occurring or manufactured, in quantities, conditions or concentrations that have, are alleged to have, or are believed to have an adverse effect on human health, habitability of a site, or the environment: (a) any dangerous, hazardous or toxic pollutant, contaminant, chemical, material or substance defined as hazardous or toxic or as a pollutant or contaminant under local, state or federal law; (b) any petroleum product, nuclear fuel or material, carcinogen, asbestos, urea formaldehyde, foamed-in-place insulation, polychlorinated biphenyl (PCBs); or (c) any other chemical or biological material or organism, that has, is alleged to have, or is believed to have an adverse effect on human health, habitability of a site, or the environment. This includes any related conditions, or any such conditions caused by third parties.

3.8.2 "Mold" means any type or form of fungus or biological material or agent, including mold, mildew, moisture, yeast and mushrooms, and any mycotoxins, spores, scents, or by-products produced or released by any of the foregoing. This includes any related conditions, or any such conditions caused by third parties.

3.8.3 "Supplied Equipment" means the equipment covered by the Work to be performed by Honeywell under this Agreement and is limited to the new equipment included in Attachment A ("Scope of Work").

3.8.4 Customer has not observed or received notice from any source (formal or informal) of (a) Hazardous Substances or Mold, either airborne or on or within the walls, floors, ceilings, heating, ventilation and air conditioning systems, plumbing systems, structure, and other components of the sites of the Work or the Support Services (each a "Site," and collectively, the "Sites"), or within furniture, fixtures, equipment, containers or pipelines in a Site; or (b) conditions that, to Customer's knowledge, might cause or promote accumulation, concentration, growth or dispersion of Hazardous Substances or Mold on or within such locations.

3.8.5 Honeywell is not responsible for determining whether the Supplied Equipment, the Covered Equipment (as defined in Attachment D), or the temperature, humidity and ventilation settings used by Customer are appropriate for Customer and the Sites with respect to avoiding or minimizing the potential for accumulation, concentration, growth or dispersion of any Hazardous Substance or Mold provided that the Supplied Equipment complies with the building codes approved by SED and applicable law.

3.8.6 If any such materials, situations, or conditions, whether disclosed or not, are in fact discovered by Honeywell or others and provide an unsafe condition for the performance of the Work or Support Services, the discovery of the condition shall constitute a cause beyond Honeywell's reasonable control and Honeywell shall have the right to cease the Work or Support Services until the area has been made safe by Customer or Customer's representative, at Customer's expense unless otherwise provided in Section 3.8.8 below. Honeywell shall have the right to terminate this Agreement if Customer has not fully remediated the unsafe condition within sixty (60) days of discovery.

3.8.7 Customer represents that Customer has not retained Honeywell to discover, inspect, investigate, identify, prevent, or remediate Mold or conditions caused by Mold.

3.8.8 Asbestos-Containing Materials: Customer has not retained Honeywell to undertake any obligations relating to the abatement, cleanup, control, removal, or disposal of asbestos-containing materials ("ACM"). Consistent with applicable Laws, Customer has supplied Honeywell with the District AHERA reports. Honeywell has reviewed the District's AHERA reports and has not identified any ACM remediation required for the execution of this scope of work. If either Honeywell or others become aware of or reasonably suspects the presence of ACM that may be disturbed by Honeywell's Work or M&V Services, it has the responsibility to notify the Customer and has the right to cease the Work or M&V Services in the affected area until the area has been made safe by the Customer or Customer's representative. As between Customer and Honeywell, Customer shall be responsible at its sole expense

for addressing the potential for or the presence of ACM in conformance with all applicable Laws and addressing the impact of its disturbance before Honeywell continues with its Work or M&V Services unless Honeywell had actual knowledge that ACM was present and acted with intentional disregard of that knowledge or Honeywell should have identified the presence of ACM upon reasonable inspection, in which case (i) Honeywell shall be responsible at is sole expense for remediating areas impacted by the disturbance of the ACM, and (ii) Customer shall resume its responsibilities for the ACM after Honeywell's remediation has been completed.

3.8.9 Other Hazardous Materials: Honeywell shall be responsible for removing or disposing of any Hazardous Materials (as defined below) that it brings to the site for use in providing Work or M&V Services ("Honeywell Hazardous Materials") and for the remediation of any areas impacted by the release of Honeywell Hazardous Materials. For other Hazardous Materials that may be otherwise present at Customer's facilities ("Non-Honeywell Hazardous Materials"), Customer shall supply Honeywell with any information in its possession relating to the presence of such materials if their presence may affect Honeywell's performance of the Work or M&V Services. If either Customer or Honeywell becomes aware of or suspects the presence of Non-Honeywell Hazardous Materials that may interfere with Honeywell's Work or M&V Services, it shall promptly stop the Work or M&V Services in the affected area and notify the other. As between Customer and Honeywell, Customer shall be responsible at its sole expense for removing and disposing of Non-Honeywell Hazardous Materials from its facilities and the remediation of any areas impacted by the release of Non-Honeywell Hazardous Materials, unless Honeywell had actual knowledge that Non-Honeywell Hazardous Materials were present and acted with intentional disregard of that knowledge, in which case (i) Honeywell shall be responsible at its sole expense for the remediation of any areas impacted by its release of such Non-Honeywell Hazardous Materials, and (ii) Customer shall remain responsible at its sole expense for the removal of Non-Honeywell Hazardous Materials that have not been released and for releases not resulting from Honeywell's performance of the Work or M&V Services. For purposes of this Agreement, "Hazardous Materials" means any material or substance that, whether by its nature or use, is now or hereafter defined or regulated as a hazardous waste, hazardous substance, pollutant or contaminant under applicable Law relating to or addressing public or employee health and safety and protection of the environment, or which is toxic, explosive, corrosive, flammable, radioactive, carcinogenic, mutagenic or otherwise hazardous or which is or contains petroleum, gasoline, diesel, fuel, another petroleum hydrocarbon product, or polychlorinated biphenyls. "Hazardous Materials" specifically includes lead-based paint and specifically excludes ACM.

3.8.10 **HONEYWELL SHALL NOT BE RESPONSIBLE FOR ANY CLAIMS OR COSTS OF WHATEVER NATURE THAT IN ANY WAY RESULTS FROM OR ARISE UNDER THE EXISTENCE OF MOLD AT CUSTOMER'S PREMISES.**

3.9 In addition to the price set forth in Article 6 of this Agreement, Customer shall pay any present and future taxes, or any other governmental charges now or hereafter imposed by existing or future laws with respect to the sale, transfer, use, ownership or possession of the Work or any Support Services provided hereunder, excluding taxes on Honeywell's net income. Customer represents that it is a governmental entity and that it will cooperate with Honeywell and provide the same with appropriate documentation so that Honeywell shall not have to pay taxes, fees or assessments or other charges of any character which may be imposed by existing or future laws with respect to the sale, transfer, use, ownership or possession of the Work or any Support Services provided hereunder.

3.10 Honeywell licensed software shall be governed exclusively by the terms and conditions of the applicable Software License Agreement and the terms of the Software License Agreement shall supersede this Agreement in the event of a conflict. Customer shall execute any applicable Software License Agreement. Failure of Customer to execute such Software License Agreement shall excuse Honeywell from any delivery requirements pursuant to this Agreement and shall be considered a material breach by Customer. This provision only applies to the Tridium building management licensed software as detailed in Attachment A.

3.11 Tax-Related Cooperation. Customer agrees to execute any documents and to provide additional reasonable cooperation to Honeywell related to Honeywell tax filings under Internal Revenue Code Section 179D. Unless otherwise agreed upon in writing, ECG Engineering, P.C. will be designated the sole Section 179D (or any amendment thereof or replacement legislation) beneficiary.

3.12 Representations and Warranties. Customer hereby represents and warrants to Honeywell that:

3.12.1 Customer has all requisite power and authority necessary to authorize the execution and delivery of this Agreement and the performance of its obligations hereunder and is not prohibited from entering into this Agreement or discharging and performing all covenants and obligations on its part to be performed under and pursuant to this Agreement. The execution, delivery and performance of this Agreement by Customer and the selection of, and the award of this Agreement to, Honeywell have been duly authorized by all necessary action on the part of Customer

and do not and will not require the consent of any trustee or holder of any indebtedness or other obligation of Customer, any other party to any other agreement with Customer or any other person or entity.

3.12.2 The selection of and award of this Agreement to Honeywell, execution and delivery of this Agreement, performance of all services, actions and responsibilities contemplated herein, and fulfillment of and compliance by Customer with the provisions of this Agreement do not and will not conflict with or constitute a breach of or a default under Customer's charter, as adopted by the laws of the state in which Customer is located, or any other applicable law, rule, ordinance, code or regulation, including but not limited to government procurement, competitive bidding, public notice, open meetings, or prior appropriation requirements. This Agreement meets the requirements of and complies with the Customer's charter and all other applicable laws, rules, ordinances, codes, and regulations. Customer has properly and validly selected Honeywell and awarded this Agreement to Honeywell pursuant to and in reliance on such charter, laws, rules, ordinances, codes, and regulations.

3.12.3 This Agreement has been duly executed and delivered by Customer. This Agreement is a legal, valid, and binding obligation of Customer enforceable against Customer in accordance with its terms, except as such enforceability is limited by laws of general applicability limiting the enforcement of creditors' rights.

ARTICLE 4
SUBCONTRACTS

4.1 HONEYWELL may subcontract some or all of the Work or Support Services. Prior to beginning Work, HONEYWELL shall provide CUSTOMER with a list of subcontractors HONEYWELL intends to use with references and a list of prior work experience for each subcontractor. Within five days of receipt of the list of subcontractors, CUSTOMER shall advise HONEYWELL in writing of any reasonable objections or concerns CUSTOMER has regarding the subcontractors selected by HONEYWELL. In the event CUSTOMER notifies HONEYWELL of objections or concerns regarding subcontractor selections, HONEYWELL will work to resolve the issue in a way acceptable to both Parties, either by contracting with an alternative subcontractor, if practical, or by otherwise addressing the CUSTOMER's concerns.

4.2 A Subcontractor is a person or entity who has a direct contract with Honeywell to perform any effort in connection with the Work. The term Subcontractor does NOT include any separate contractors employed by Customer or such separate contractors' subcontractors.

4.3 For the purposes of this Agreement, no contractual relationship shall exist between Customer and any Subcontractor. Honeywell shall be responsible for the management of its Subcontractors in their performance of their Work.

ARTICLE 5
INSTALLATION AND ACCEPTANCE

5.1 The Work to be performed under this Agreement shall be commenced and substantially completed as set forth in the Installation Schedule attached hereto as Attachment C, which describes the Parties' intentions respecting the times by which the components or aspects of the Work therein set forth shall be installed and/or ready for acceptance or beneficial use by CUSTOMER. The Installation Schedule may be adjusted to reflect the final Effective Date, or as otherwise set forth in this Agreement.

5.2 If Honeywell is delayed at any time in the progress of performing its obligations under this Agreement by any act of Customer or any contractor employed by Customer; or by labor disputes (Which are not specific to Honeywell), fire, unusual delay in transportation, pandemics, epidemics, adverse weather conditions or other events or occurrences beyond Honeywell's reasonable control (an "Excusable Delay"), then the parties shall agree upon an extension of the time only for performance of the obligations affected by such Excusable Delay only for that limited period of time that is reasonably necessary to perform.

5.3 HONEYWELL shall provide Delivery and Acceptance Certificates in a form acceptable to CUSTOMER and HONEYWELL (the "Delivery and Acceptance Certificates") for the Work provided pursuant to the Schedule identified in Attachment J. Upon receipt of each Delivery and Acceptance Certificate, the Engineer of Record shall promptly inspect the Work performed by HONEYWELL identified therein and, within ten (10) days after receipt of the Certificate, make a determination as to whether such work is substantially complete. If the Engineer determines that the work is substantially complete, the Engineer shall notify both CUSTOMER and HONEYWELL in writing of

its determination. Upon receipt of an Engineer's determination of substantial completion, the Customer shall either execute each such Delivery and Acceptance Certificate or reject the Engineer's determination with a statement of the reason(s) why it has taken such action, within thirty (30) days after such certification by the Engineer. In the event the Engineer determines the work is not substantially complete, the Engineer of Record shall provide HONEYWELL with a written statement identifying specific material performance deficiencies. HONEYWELL shall correct all such material deficiencies, give written notice to CUSTOMER when all such items have been corrected, and resubmit the Certificate to the Engineer. As a condition to the issuance of the Certificate of Substantial Completion, HONEYWELL must provide to the Customer a complete list of all manuals and training sessions provided by HONEYWELL to Customer which shall include a description of the manual or training provided, the date, time, and location where the manual or training was provided, the name of the person providing the manual or training and the name of the person receiving the manual or training. Customer shall review the list and description provided by HONEYWELL and if Customer agrees that such manuals and training were provided as set forth therein, Customer will provide an acknowledgement of receipt of manuals and training. If Customer does not agree that such manuals and training were provided by HONEYWELL, then HONEYWELL shall immediately provide such manuals and training. The Engineer of Record shall complete and provide to the parties and to SED a Certificate of Substantial Completion in the form required by SED. The Parties intend that a final Delivery and Acceptance Certificate will be executed for the Work as soon as all Work is installed, operating, and certified as complete by the Engineer of Record. Execution and delivery by CUSTOMER of such final Delivery and Acceptance Certificate with respect to the Work shall constitute "Final Acceptance" of such Work performed by HONEYWELL pursuant to the Installation Schedule.

ARTICLE 6
PRICE AND PAYMENT

6.1 Price

6.1.1 The "Price" for the Work is Twenty-Three Million Three Hundred Fifty Thousand Dollars ($23,350,000), subject to the adjustments set forth in Articles 5 and 7.

6.1.2 The price for Support Services is set forth in Attachment D hereto, subject to the adjustments described therein.

6.1.3 The Price is based upon laws, codes, and regulations in existence as of the Effective Date. Any changes in or to applicable laws, codes and regulations affecting the cost of the Work shall be negotiated between the parties and any adjustment in the price and/or schedule shall be reflected in a change order executed by the parties. In the event of a price adjustment, Honeywell shall ensure that the savings cover the contract costs over the term of the Agreement per SED requirements.

6.1.4 The Price may be modified for delays caused by Customer and for Changes in the Work, all pursuant to Article 7.

6.1.5 The license fees for all licensed software are included in the Price to be paid by Customer.

6.2 Payment

6.2.1 Upon execution of this Agreement, Customer shall pay or cause to be paid to Honeywell the full Price in accordance with the Payment Schedule, Attachment E. Customer shall make payments for the Support Services in accordance with Attachment D.

6.2.2 Payments for the Work past due more than thirty (30) days shall be governed by Article XI-A of the State Finance Law to the extent required by law.

ARTICLE 7
CHANGES IN THE PROJECT

7.1 A Change Order is a written order signed by Customer and Honeywell authorizing a change in the Work or adjustment in the Price, or a change to the Installation Schedule described in Attachment C.

7.2 The parties, without invalidating this Agreement, may request changes in the Work to be performed under this Agreement, consisting of additions, deletions, or other revisions to the Work or Installation Schedule ("Change Orders"). Such adjustments shall be determined by mutual agreement of the parties. Any Change Order must be signed

by an authorized representative of each party. Claims for equitable adjustment may be asserted in writing within a reasonable time from the date a party becomes aware of a change to the Work by written notification. Failure to promptly assert a request for equitable adjustment, however, shall not constitute a waiver of any rights to seek any equitable adjustment with respect to such change.

7.3 **Claims for Concealed or Unknown Conditions**: If conditions are encountered at any Site that are (1) subsurface or otherwise concealed physical conditions which differ materially from those indicated in the Contract Documents, or (2) unknown physical conditions of an unusual nature, which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, then notice by the observing party shall be given to the other party promptly before conditions are disturbed and in no event later than twenty-one (21) days after first observance of the conditions, and, if appropriate, an equitable adjustment to the Price and Installation Schedule shall be made by a Change Order. If agreement cannot be reached by the Parties, the party seeking an adjustment in the Price or Installation Schedule may assert a claim in accordance with Paragraph 7.4. Any claims for concealed or unknown condition by Honeywell, however, shall not be valid if Honeywell should have been able to become aware of such conditions upon a visual inspection of either the premises or contract documents.

7.4 If Honeywell wishes to make a claim for an increase in the Price or an extension in the Installation Schedule it shall give Customer written notice thereof within a reasonable time after the occurrence of the event giving rise to such claim. This notice shall be given by Honeywell before proceeding to execute the Work, except in an emergency endangering life or property, in which case Honeywell shall have the authority to act, in its discretion, to prevent threatened damage, injury or loss. Claims arising from delay shall be made within a reasonable time after the delay. Increases based upon design and estimating costs with respect to possible changes requested by Customer shall be made within a reasonable time after the decision is made not to proceed with the change. No such claim shall be valid unless so made. If Customer and Honeywell cannot agree on the amount of the adjustment in the Price, or the Installation Schedule, it shall be determined pursuant to the provisions of Article 12. Any change in the Price or the Installation Schedule resulting from such claim shall be authorized by Change Order.

7.4.1 The Engineer of Record shall make the initial determination with respect to all claims for change orders, subject to dispute or litigation by either party in accordance with the provisions of Article 12. Honeywell shall present a draft Change Order document to the Customer for review within ninety (90) days from the date Honeywell becomes aware of the need for a Change Order.

7.5 **Emergencies:** In any emergency affecting the safety of persons or property, Honeywell shall act, at its discretion, to prevent threatened damage, injury, or loss. Any increase in the Price or extension of time claimed by Honeywell on account of emergency work shall be determined as provided in Section 7.4.

ARTICLE 8
INSURANCE, INDEMNITY, WAIVER OF SUBROGATION, AND LIMITATION OF LIABILITY

8.1 Indemnity

8.1.1 To the fullest extent allowable by law, Honeywell shall defend, indemnify, and hold harmless Customer, its officers, employees, agents and assigns from and against all claims, actions, damages, liabilities and expenses, including reasonable attorney's fees, arising out of or related to personal injury or property damage to the extent caused by Honeywell's negligence or willful misconduct in connection with this Agreement.

8.1.1.1 Honeywell shall indemnify, defend, and hold harmless Customer, its employees, agents, and assigns against all claims, actions, damages, liabilities, and expenses, including reasonable attorneys' fees as determined by court order arising out of or related to claims of construction or materialman's liens made by any subcontractor or materialman.

8.1.2 Reserved.

8.1.3 Customer shall require any other contractor who may have a contract on this project and related to this Agreement with Customer to perform work in the areas where Work will be performed under this Agreement to agree

to indemnify Customer and Honeywell and hold them harmless from all claims for bodily injury and property damage that may arise from that contractor's operations. Such provisions shall be in a form satisfactory to Honeywell.

8.2 Contractor's Insurance: Honeywell shall, at its own expense, carry and maintain in force at all times from the effective date of the Contract through final completion of the work the following insurance. Honeywell will not issue coverage on a per project basis. It is agreed, however, that Honeywell has the right to insure or self-insure any of the insurance coverages listed below:

(a) Commercial General Liability Insurance to include contractual liability and products/completed operations liability with a combined single limit of USD $10,000,000 per occurrence with a $15,000,000 aggregate. Such policy will be written on an occurrence form basis and the coverage shall be primary and non-contributory in favor of the Customer; Such coverage shall also include Personal & Advertising Injury - $1,000,000.00 Each Occurrence Medical Expenses (any one person) - $500,000.00

(b) If automobiles are used in the execution of the Agreement, Automobile Liability Insurance with a minimum combined single limit of USD $5,000,000 per occurrence. Coverage will include all Honeywell owned, leased, non-owned and hired vehicles.

(c) Where applicable, "All Risk" Property Insurance, including Builder's Risk insurance, for physical damage to property which is assumed by Honeywell in the Agreement. Such amount to be approved by the Owner.

(d) Workers' Compensation Insurance Coverage for Honeywell employees: A - Statutory limits and Coverage B-Employer's Liability Insurance with limits of USD $1,000,000 for bodily injury each accident or disease.

In accordance with Section 142 of the State Finance Law, this Contract shall be void and of no force and effect unless Honeywell shall provide and maintain coverage during the life of this contract for the benefit of such employees as are required to be covered by the provisions of the Workers' Compensation Law.

8.2.1 In addition to the coverages required and under the same terms and requirements of such coverages, Honeywell shall provide hazardous material liability insurance as follows: $2,000,000 occurrence/$2,000,000 aggregate, including products and completed operations. Such insurance shall include coverage for Honeywell's operations including, but not limited to, removal, replacement enclosure, encapsulation and/or disposal of asbestos, or any other hazardous material, along with any related pollution events, including coverage for third-party liability claims for bodily injury, property damage and clean-up costs. If a retroactive date is used, it shall pre-date the inception of the Contract. If motor vehicles are used for transporting hazardous materials, Honeywell shall provide pollution liability broadened coverage as well as proof of MCS 90. Coverage shall fulfill all requirements set forth herein and shall extend for a period of three (3) years following acceptance by the Customer of the Certificate of Final Completion.

8.2.2 Prior to commencement of the Work, Honeywell will furnish evidence of said insurance coverage in the form of a Memorandum of Insurance with the Customer listed as an additional insured which is accessible at: http://honeywell.com/sites/moi/. All insurance required in this Article will be written by companies with a rating of no less than "A-, XII" by A.M. Best or equivalent rating agency. Honeywell will endeavor to provide a thirty (30) day notice of cancellation or non-renewal to the Customer. In the event that a self-insured program is implemented, Honeywell will provide adequate proof of financial responsibility.

8.2.3 In the event that any of the insurance coverage to be provided by Honeywell to the Customer contains a deductible, Honeywell agrees to indemnify and hold Customer harmless from the payment of such deductible applicable to insurance furnished by Honeywell.

8.2.4 Honeywell shall require all subcontractors and /or Architect/Engineer to carry similar insurance coverages and limits of liability as set forth herein and adjusted to the nature of subcontractors' operations and submit same to the Customer for approval prior to start of any work. In the event Honeywell fails to obtain the required certificates of insurance from its Subcontractors and/or Architect/Engineer, and a claim is made or suffered, Honeywell shall indemnify, defend, and hold harmless the Customer, its Board, officers, agents, or employees from any and all claims for which the required insurance would have provided coverage. This indemnity obligation is in addition to any other indemnity obligation that will be provided for in the Contract.

8.2.5 Honeywell acknowledges that its failure to obtain or keep current the insurance coverage required and/or its failure to ensure that its subcontractors and/or Architect/Engineer maintain the required coverage, shall constitute a material breach of contract and subjects Honeywell to liability for damages, including but not limited to direct, indirect, consequential, special and such other damages the Customer sustains as a result of such breach. In addition, Honeywell shall be responsible for the indemnification to the Customer of any and all costs associated with the aforementioned lapse in coverage, including but not limited to reasonable attorney's fees.

8.2.6 All policies obtained by Honeywell, its subcontractors and/or Architect/Engineer shall include a waiver of subrogation in favor of the Customer.

8.2.7 Customer in good faith may adjust and settle a loss with Honeywell's insurance carrier. Honeywell waives all rights against Customer, its Board, officers, agents, and employees for damages caused by fire or other perils to the extent of actual recovery of any insurance proceeds under any insurance policy procured or other property insurance applicable to Honeywell's work.

8.3. CUSTOMER's Liability Insurance

8.3.1 Customer shall be responsible for purchasing and maintaining its own liability insurance and, at its option, may purchase and maintain such insurance as will protect it against claims that may arise from operations under this Agreement.

8.4 Insurance to Protect Project

8.4.1 Customer shall purchase and maintain all risk full cost replacement property insurance in a form acceptable to Honeywell for the length of time to complete the Project. This insurance shall include as named additional insureds Honeywell and Honeywell's Subcontractors and Sub-subcontractors and shall include, at a minimum, coverage for fire, windstorm, flood, earthquake, theft, vandalism, malicious mischief, transit, collapse, testing, offsite storage, and damage resulting from defective design, workmanship, or material. Customer will increase limits of coverage, if necessary, to reflect estimated replacement costs. Customer will be responsible for any co-insurance penalties or deductibles. If the Work covers an addition to or is adjacent to an existing building, Honeywell and its Subcontractors and Sub-subcontractors shall be named additional insureds under Customer's Property Insurance covering such building and its contents.

8.4.2 Customer shall purchase and maintain such insurance as will protect Customer and Honeywell against loss of use of Customer's property due to those perils insured pursuant to Subparagraph 8.4.1. Such policy will provide coverage for expenses of expediting materials, continuing overhead of Customer and Honeywell, necessary labor expense including overtime, loss of income by Customer and other determined exposures. Exposures of Customer and Honeywell shall be determined by mutual agreement and separate limits of coverage fixed for each item.

8.4.3 Customer shall provide evidence of Insurance to HONEYWELL before work on the Project begins. All insurance coverage(s) must be with a carrier rated A- or better by one of the National Insurance Rating Agencies such as A.M. Best. HONEYWELL will be given thirty (30) days notice of cancellation, non-renewal, or any endorsements restricting or reducing coverage.

8.5 Property Insurance Loss Adjustment

8.5.1 Any insured loss covered under insurances required pursuant to Article 8.4 shall be adjusted with Customer and Honeywell and made payable to Customer and Honeywell as trustees for the insureds, as their interests may appear, subject to any applicable mortgagee clause.

8.5.2 Upon the occurrence of an insured loss, monies received will be deposited in a separate account and the trustees shall make distribution in accordance with the agreement of the parties in interest, or in the absence of such agreement, in accordance with an arbitration award pursuant to Article 12. If the trustees are unable to agree between themselves on the settlement of the loss, such dispute shall also be submitted to arbitration pursuant to Article 12.

8.6 Limitation of Liability

8.6.1 NEITHER HONEYWELL NOR CUSTOMER WILL BE RESPONSIBLE TO THE OTHER FOR ANY CONSEQUENTIAL, PUNITIVE, OR EXEMPLARY DAMAGES, LOSS OF PROFITS OR REVENUE, REGARDLESS OF HOW CHARACTERIZED AND REGARDLESS OF A PARTY HAVING BEEN ADVISED OF THE POSSIBILITY OF SUCH POTENTIAL LOSSES OR RELIEF, ARISING IN ANY MANNER FROM THIS AGREEMENT, THE WORK, THE IMPROVEMENT MEASURES, THE PREMISES, THE M&V SERVICES, OR OTHERWISE. Notwithstanding anything to the contrary, the limitation of liability herein does not diminish Honeywell's responsibilities to the Customer with respect to the energy performance guarantee as defined in Attachment D. THE AGGREGATE LIABILITY OF HONEYWELL FOR ANY CLAIMS ARISING OUT OF OR RELATED TO THIS AGREEMENT WILL IN NO CASE EXCEED FIVE (5) TIMES THE PRICE SET FORTH IN ARTICLE 6 OF THIS AGREEMENT; PROVIDED, HOWEVER, THAT THIS LIMITATION ON LIABILITY

SHALL NOT APPLY TO DAMAGES CAUSED BY HONEYWELL'S GROSS NEGLIGENCE, RECKLESS ACTS OR OMISSIONS OR WILLFUL MISCONDUCT. Nothing in this Section 8.6.1 shall be construed to limit the recovery for compensatory or actual direct damages suffered by Customer resulting from Honeywell or its agent's grossly negligent, or reckless acts or omissions or willful misconduct. In addition, the forgoing limitation of liability shall not limit Customer's right to seek damages related to the loss of use of its facilities to the extent such damages are caused by Honeywell's negligence and do not exceed an aggregate of $200,000. If this Agreement covers fire safety or security equipment, Customer understands that Honeywell is not an insurer regarding those services, and that Honeywell shall not be responsible for any damage or loss that may result from fire safety or security equipment that fails to prevent a casualty loss.

ARTICLE 9
TERMINATION OF THE AGREEMENT

9.1 If Honeywell defaults in or fails or neglects to carry forward the Work in accordance with this Agreement, Customer may provide notice in writing of its intention to terminate this Agreement to Honeywell. If Honeywell, following receipt of such written notice, neglects to cure or correct the identified deficiencies within thirty (30) business days, Customer may provide a second written notice. If Honeywell has not, within thirty (30) business days after receipt of such notice, acted to remedy and make good such deficiencies, Customer may terminate this Agreement and take possession of the Site together with all materials thereon, and move to complete the Work itself expediently. If the unpaid balance of the Price exceeds the expense of finishing the Work, the excess shall be paid to Honeywell, but if the expense exceeds the unpaid balance, Honeywell shall pay the difference to Customer. Nothing in this provision shall be deemed a waiver of the parties' rights to institute an action for damages, breach of contract, tort, costs, and fees.

9.1.1 Notwithstanding the foregoing, the Customer reserves the right to terminate this Agreement for any reason, or no reason whatsoever, upon thirty (30) days written notice to Honeywell. In the event of such termination, the parties shall endeavor in an orderly manner to wind down activities hereunder. In the event of such termination, all reports and services due to Customer must be completed by Honeywell, its employees, and/or agents within thirty (30) days of the termination date. In the event of termination under this subsection, Honeywell shall have the right to recover from Customer payment for Work executed prior to the date of termination.

9.2 If Customer fails to make payments as they become due, or otherwise defaults or breaches its obligations under this Agreement, Honeywell may give written notice to Customer of Honeywell's intention to terminate this Agreement. If, within sixty (60) days following receipt of such notice, Customer fails to make the payments then due, or otherwise fails to cure or perform its obligations, Honeywell may, by written notice to Customer, terminate this Agreement and recover from Customer payment for Work executed and for actual losses sustained due to termination. Nothing in this provision shall be deemed a waiver of the parties' rights to institute an action for damages, breach of contract, tort, costs, and fees.

ARTICLE 10
ASSIGNMENT AND GOVERNING LAW

10.1 This Agreement shall be governed by the law of the State where the Work is performed. Disputes involving this contract including the breach or alleged breach thereof, may not be submitted to binding arbitration located in the County of the Customer, but must, instead, be heard in a court of competent jurisdiction of the State of New York.

10.2 Neither party to the Agreement shall assign this Agreement or sublet it as a whole without the written consent of the other party. Such consent shall not be unreasonably withheld. HONEYWELL may enter into subcontracts for the Work in accordance with Section 4.1.

10.3 This project is subject to prevailing wage rate requirements. All workers will be paid according to the prevailing wage rates set forth by the New York State Department of Labor.

10.4 In addition to the methods of service allowed by the State Civil Practice Law & Rules, Honeywell hereby consents to service of process upon it by registered or certified mail, return receipt requested. Service hereunder shall be complete upon Honeywell's actual receipt of process or upon Customer's receipt of the return thereof by the United States Postal Service as refused or undeliverable. Honeywell must promptly notify Customer, in writing, of each and every change of address to which service of process can be made, Service by Customer to the last known address shall be sufficient. Honeywell shall have thirty (30) calendar days after service hereunder is complete in which to respond.

ARTICLE 11
MISCELLANEOUS PROVISIONS

11.1 The Table of Contents and headings in this Agreement are for information and convenience only and do not modify the obligations of this Agreement.

11.2 Confidentiality. As used herein, the term "Confidential Information" shall mean any information in readable form or in machine-readable form, including software supplied to Customer by Honeywell that has been identified or labeled as "Confidential" and/or "Proprietary" or with words of similar import. Confidential Information shall also mean any information that is disclosed orally and is designated as "Confidential" and/or "Proprietary" or with words of similar import at the time of disclosure and is reduced to writing, marked as "Confidential" and/or "Proprietary" or with words of similar import, and supplied to the receiving party within ten (10) days of disclosure. The electronic platform, code, and arrangement upon which the legible Energy Savings Calculations are published is "Proprietary." Customer shall notify Honeywell if it receives a Freedom of Information Law request relating to information labeled as "Confidential" and /or "Proprietary" by Honeywell and Honeywell shall then have thirty (30) days after it receives such notification to respond to Customer by either providing a redacted version of the requested materials in accordance with New York's Freedom of Information Law or advising that the requested materials may be disclosed. In the event Honeywell does not respond to the notification from Customer within the specified period, Honeywell shall be deemed to have agreed to the disclosure of the materials as requested.

All rights in and to Confidential Information and to any proprietary and/or novel features contained in Confidential Information disclosed are reserved by the disclosing party; and the party receiving such disclosure will not use the Confidential Information for any purpose except in the performance of this Agreement and will not disclose any of the Confidential Information to benefit itself or to damage the disclosing party. This prohibition includes any business information (strategic plans, etc.) that may become known to either party.

Each party shall, upon request of the other party or upon completion or earlier termination of this Agreement, return the other party's Confidential Information and all copies thereof.

Notwithstanding the foregoing provisions, neither party shall be liable for any disclosure or use of information disclosed or communicated by the other party if the information:

(a) is publicly available at the time of disclosure or later becomes publicly available other than through breach of this Agreement; or
(b) is known to the receiving party at the time of disclosure; or
(c) is subsequently rightfully obtained from a third party on an unrestricted basis; or
(d) is approved for release in writing by an authorized representative of the disclosing party.

The obligation of this Article shall survive any expiration, cancellation, or termination of this Agreement.

11.3 Customer retains all rights that it already holds in data and other information that Customer or persons acting on its behalf input, upload, transfer, or make accessible in relation to, or which is collected from Customer's devices or equipment pursuant to, this Agreement ("Input Data"). Honeywell and its affiliates have the right to collect, retain, transfer, disclose, duplicate, analyze, modify, and otherwise use Input Data to provide, protect, improve, or develop any products or services. Honeywell and its affiliates may also use Input Data for any other purpose provided it is in an anonymized form that does not identify Customer. Any Customer Personal Data contained within Input Data shall only be used or processed in accordance with applicable law and any data privacy terms agreed upon by the parties. To the extent required by Honeywell in order to perform its obligations under this Agreement, Customer will enable Internet connectivity between its applicable system(s) and the Honeywell Sentience™ cloud platform, or other Honeywell-utilized system(s), and hereby consents to such connectivity throughout the term of this Agreement. All information, analysis, insights, inventions, and algorithms derived from Input Data by or on behalf of Honeywell and/or its affiliates (but excluding Input Data itself) and any intellectual property rights related thereto, are owned exclusively and solely by Honeywell and are Honeywell's confidential information. This Section survives expiration or termination of this Agreement and shall apply notwithstanding any other provision of this Agreement or any other agreement.

11.4 Risk of loss for all equipment and materials provided by Honeywell hereunder shall transfer to Customer upon installation at Customer's Sites from Honeywell or its Subcontractor and title shall pass upon final acceptance or final payment by Customer to Honeywell, whichever occurs later.

11.5 Final notice or other communications required or permitted hereunder shall be sufficiently given if personally delivered to the person specified below, or if sent by registered or certified mail, return receipt requested, postage prepaid, addressed as follows:

To Honeywell:
HONEYWELL BUILDING SOLUTIONS
General Counsel
715 Peachtree Street, N.E.
Atlanta, GA 30308

To Customer:
ROOSEVELT UFSD
240 Denton Place
Roosevelt, New York 11575
Attention: Superintendent of Schools & Assistant Superintendent for Business

Copy to:
GUERCIO & GUERCIO, LLP
77 Conklin Street
Farmingdale, New York 11735
Attn: Anthony J. Fasano, Esq.

Service hereunder shall be complete upon Honeywell's actual receipt of process or upon the Customer's receipt of the return thereof by the United States Postal Service as refused or undeliverable. Honeywell must promptly notify the Customer, in writing, of each and every change of address to which service of process can be made, Service by the Customer to the last known address shall be sufficient. Honeywell shall have thirty (30) calendar days after service hereunder is complete in which to respond.

11.6 Waiver. Either party's failure to insist upon the performance or fulfillment of any of the other party's obligations under this Agreement shall not be deemed or construed as a waiver or relinquishment of the future performance of any such right or obligation hereunder.

11.7 Honeywell guarantees Customer will realize the Guarantee Savings as defined in Attachment D during the term of this Agreement. **NOTWITHSTANDING THE FOREGOING**, unless stated otherwise in Attachment D, **HONEYWELL (A) MAKES NO REPRESENTATION OR WARRANTY, EXPRESS OR IMPLIED, WITH RESPECT TO ANY FINANCIAL PROJECTIONS, CASH FLOW MODELS, PRO FORMA FINANCIAL STATEMENTS OR OTHER DOCUMENTS, DATA OR INFORMATION PROVIDED BY OR ON BEHALF OF HONEYWELL TO CUSTOMER OR ITS REPRESENTATIVES PRIOR TO THE EXECUTION AND DELIVERY OF THIS AGREEMENT THAT ARE NOT INCLUDED IN THIS AGREEMENT, INCLUDING ITS ATTACHMENTS AND EXHIBITS (COLLECTIVELY, THE "PRIOR PROJECTIONS"), AND (B) HEREBY DISCLAIMS ALL IMPLIED WARRANTIES WITH RESPECT TO SUCH PRIOR PROJECTIONS. CUSTOMER HEREBY ACKNOWLEDGES AND AGREES THAT (i) HONEYWELL DOES NOT GUARANTEE THAT ANY RESULTS SET FORTH IN ANY PRIOR PROJECTIONS WILL BE ACHIEVED, (ii) ACTUAL RESULTS MAY VARY MATERIALLY FROM THE PRIOR PROJECTIONS, AND (iii) CUSTOMER HAS NOT RELIED UPON ANY SUCH PRIOR PROJECTIONS IN DETERMINING TO ENTER INTO THIS AGREEMENT AND CONSUMMATE THE TRANSACTIONS CONTEMPLATED HEREBY.**

11.8 In the event that any clause or provision of this Agreement or any part thereof shall be declared invalid by any court having jurisdiction, such invalidity shall not affect the validity or enforceability of the remaining portions of this Agreement.

11.9 HONEYWELL IS NOT, NOR IS HONEYWELL COMPENSATED AS, A MUNICIPAL ADVISOR OR FIDUCIARY ACTING ON CUSTOMER'S BEHALF. ANY AND ALL FINANCIAL AND OTHER INFORMATION PROVIDED ABOUT OR RELATING TO MUNICIPAL SECURITIES, FEDERAL, STATE, OR LOCAL TAX CREDITS (INCLUDING, WITHOUT LIMITATION, ENERGY CREDITS OR INVESTMENT TAX CREDITS), OR OTHER MUNICIPAL FINANCIAL PRODUCTS IS PROVIDED FOR GENERAL INFORMATIONAL AND EDUCATIONAL PURPOSES ONLY AND SHOULD NOT BE CONSTRUED AS ADVICE, IS PROVIDED "AS-IS" WITHOUT WARRANTY OF ANY KIND (EXPRESS

OR IMPLIED) AND WITHOUT ANY REPRESENTATION WITH RESPECT TO ACCURACY OR COMPLETENESS, AND MUST NOT BE RELIED UPON IN CONNECTION WITH ANY SECURITIES, INVESTMENT OR FINANCIAL DECISION OR OTHER ACTION/INACTION. CUSTOMER SHOULD OBTAIN THE ADVICE OF A FINANCIAL ADVISOR, MUNICIPAL ADVISOR OR OTHER THIRD PARTY LICENSED AND QUALIFIED TO ADVISE YOU REGARDING ANY OF THE INFORMATION PROVIDED ABOUT, OR THE POTENTIAL SUITABILITY OF, MUNICIPAL SECURITIES, FEDERAL, STATE, OR LOCAL TAX CREDITS (INCLUDING, WITHOUT LIMITATION, ENERGY CREDITS OR INVESTMENT TAX CREDITS), OR MUNICIPAL FINANCIAL PRODUCTS.

11.10 Customer's Request for Proposal, Honeywell's proposal and any other documents submitted by Honeywell to the Customer prior to negotiation of this Agreement are expressly excluded from and are not a part of this Agreement, however, CUSTOMER shall be entitled to rely on representations made by Honeywell with respect to its skill and experience. The parties agree that although the Honeywell Proposal may have contained scope items, guarantee savings and M&V options other than those stated in this Agreement, the Scope of Work, Schedule of Savings, and M&V plan were developed jointly by the parties through negotiation. The Customer has chosen to purchase the scope of work set forth in Attachment A. The Customer accepts the Energy Guarantee and Schedule of Savings and agrees to the M&V plan set forth in Attachment D.

This Agreement, including all attachments and exhibits hereto, represents the entire agreement between CUSTOMER and HONEYWELL. This Agreement shall not be superseded by any provisions of the documents for construction and may be amended only by written instrument signed by both CUSTOMER and HONEYWELL. None of the provisions of this Agreement shall be modified, altered, changed, or voided by any subsequent Purchase Order issued by CUSTOMER, which relates to the subject matter of this Agreement.

11.11 This Agreement may be executed in counterparts, each of which shall be deemed an original and all of which shall constitute one and the same instrument. The Parties agree that a scanned or electronically reproduced copy or image of this Agreement bearing the signatures of the Parties hereto shall be deemed an original and may be introduced or submitted in any action or proceeding as competent evidence of the execution, terms and existence of this Agreement notwithstanding the failure or inability to produce or tender an original, executed counterpart of this Agreement and without the requirement that the unavailability of such original, executed counterpart of this Agreement first be proven.

11.12 **Non-Discrimination**. Honeywell agrees not to discriminate against any employee, or applicant for employment, to be employed in the performance of this Agreement, with respect to hire, tenure, terms, conditions or privileges of employment, or any matter directly or indirectly related to employment because of age, sex, race, disability, color, religion, national origin, military service, or ancestry in accordance with applicable Federal, New York State or local laws, rules, and ordinances.

11.13 **Payment and Performance Bond**. Honeywell shall, prior to commencement of construction, deliver to the CUSTOMER Performance and Payment Bonds in a sum equal to the Contract Price with sureties licensed in the State of New York and satisfactory to the CUSTOMER conditioned upon the faithful performance by HONEYWELL of implementation of the ECMs as it may be from time to time modified by Change Orders. Such bonds to be in such form and otherwise to contain such provisions which are reasonably satisfactory to the CUSTOMER.

In addition, a rider including the following provisions shall be attached to each Bond:

1. Surety hereby agrees that it consents to and waives notice of any addition, alteration, omission, change, or other modification of the Contract Documents. Such addition, alteration, change, extension of time, or other modification of the Contract Documents, or forbearance on the part of either the Owner or the Energy Performance Contractor to the other, shall not release the Surety of its obligations hereunder and notice to the Surety of such matters is hereby waived.
2. Surety further agrees that in event of any default by the Owner in the performance of the Owner's obligations to Honeywell under the Contract, Honeywell shall cause written notice of such default (specifying said default in detail) to be given to the Owner, and the Owner shall have thirty (30) days from time after receipt of such notice within which to cure such default, or such additional reasonable period of time as may be required if the nature of such default is such that it cannot be cured within thirty (30) days. Such Notice of Default shall be sent by certified or registered U.S. Mail, return receipt requested, first class postage prepaid, to Lender and the Owner.

11.14 **Independent Contractor**. Nothing in this Agreement shall be construed as reserving to the CUSTOMER any right to exercise control over or to direct in any respect the conduct or management of business or operations of HONEYWELL on the property. The entire control or direction of such business and operations shall be in and remain in HONEYWELL, subject to HONEYWELL's performance obligations under this Agreement. Neither HONEYWELL nor any person performing any duties or engaged in any work on the property on behalf of HONEYWELL shall be deemed an employee or agent of the CUSTOMER.

Nothing in this Section shall be deemed to be a waiver of the Customer's right to use its property. The CUSTOMER and HONEYWELL are independent of one another and shall have no other relationship relating to or arising out of this Agreement. Neither party shall have or hold itself out as having the right or authority to bind or create liability for the other by its intentional or negligent acts or omissions or to make any contractor or otherwise assume any obligation or responsibility in the name of or on behalf of the other party.

It is understood and agreed that Honeywell, its employees, agents, subcontractors and employees of such agents and subcontractors, shall adhere to the Customer's policies with respect to conduct on the Customer's property provided that Customer has provided Honeywell such policies and procedure in writing prior to commencement of the Work as well as any and all federal, state, and local laws, rules, ordinances, policies, and procedures applicable to construction projects on such premises.

11.15 **Third Party Beneficiaries.** Except as may be specifically provided for in this Agreement, the parties hereto do not intend to create any rights for, or grant any remedies to, any third party beneficiary of this Agreement.

11.16 **Set-off Rights.** CUSTOMER shall have all of its common law, equitable and statutory rights of set-off. These rights shall include, but not be limited to, the CUSTOMER's option to withhold for the purposes of set-off any moneys due to HONEYWELL under this contract up to any amounts due and owing to the CUSTOMER with regard to this contract. CUSTOMER shall exercise its set-off rights in accordance with normal School District practices including, in cases of set-off pursuant to an audit, the finalization of such School District audit by the State agency, its representatives, or the State Comptroller.

11.17 **NON-APPROPRIATION**. This Agreement shall be executory only to the extent of the monies appropriated and available for the purposes of the contract, and no liability on account therefor shall be incurred beyond the amount of such monies. It is understood that neither this contract nor any representation by any public employee or officer creates any legal or moral obligation to request, appropriate or make available monies for the purpose of the contract.

11.18 HONEYWELL and the CUSTOMER acknowledge that this Agreement 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.

11.19 **INTERNATIONAL BOYCOTT PROHIBITION**:

In accordance with Section 220-f of the Labor Law and Section 139-h of the State Finance Law, if this contract exceeds $5,000, Honeywell agrees, as a material condition of the contract, that neither Honeywell nor any substantially owned or affiliated person, firm, partnership or corporation has participated, is participating, or shall participate in an international boycott in violation of the federal Export Administration Act of 1979 (50 USC App. Sections 2401 et seq.) or regulations thereunder. If Honeywell, or any of the aforesaid affiliates of Energy Performance Contractor, is convicted or is otherwise found to have violated said laws or regulations under the final determination of the United States Commerce Department or any other appropriate agency of the United States subsequent to the contractors execution, such contract, amendment, or modification thereto shall be rendered forfeit and void. Honeywell shall so notify the Customer within five (5) business days of such conviction, determination, or disposition of appeal.

If this is a public work contract covered by Article 8 of the Labor Law or a building service contract covered by Article 9 thereof, neither Honeywell's employees nor the employees of its subcontractors may be required or permitted to work more than the number of hours or days stated in said statutes, except as otherwise provided in the State Employment Regulation and as set forth in prevailing wage and supplement schedules issued by the New York State Department of Labor. Furthermore, Honeywell and its subcontractors must pay at least the prevailing wage rate and pay or provide the prevailing supplements, including the premium rates for overtime pay, as determined by the New York State Department of Labor in accordance with the Labor Law.

11.20 RECORDS:

Honeywell shall establish and maintain complete and accurate books, records, documents, accounts, and other evidence directly pertinent to performance under this contract (hereinafter, collectively "the Records"). The Records must be kept for the balance of the calendar year in which they were made and for six (6) additional years thereafter. The State Comptroller, the Attorney General, and any other person or entity authorized to conduct an examination, as well as the agency or agencies involved in this contract, shall have access to the Records during normal business hours at an office of Honeywell within the State of New York or, if no such office is available, at a mutually agreeable and reasonable venue within the State, for the term specified above for the purposes of inspection, auditing and copying. Nothing contained herein shall diminish, or in any way adversely affect, Customer's right to discovery in any pending or future litigation. Any audit and inspection rights include only the rights to verify compliance with the Contract Documents and do not include the right to review HONEYWELL's proprietary information unless otherwise required by law.

ARTICLE 12
DISPUTE RESOLUTION

12.1 HONEYWELL and CUSTOMER shall exert best efforts to resolve any dispute that may arise respecting the Work or the Project. In the event that a particular dispute cannot be so resolved, HONEYWELL and CUSTOMER agree that the dispute shall be resolved in a state or federal court of competent jurisdiction, in the County of Nassau, State of New York.

APPROVALS:
The parties hereby execute this Agreement as of the date first set forth herein by the signatures of their duly authorized representatives:

HONEYWELL INTERNATIONAL INC.

By Terence M. Guiry

Name Terence M. Guiry

Title Senior Business Consultant

Date 2/13/2023

ROOSEVELT UFSD

By Rose Gretschier

Name Rose Gretschier

Title President Roosevelt BOE

Date 2/7/2023

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ATTACHMENT A
SCOPE OF WORK

PART 1 – PRODUCTS & EXECUTION

All work performed under the energy performance contract will be in accordance with the provisions of Section 01050 – "Uniform Safety Standards for School Construction and Maintenance Projects – Commissioner's Regulations" specification incorporated herein by reference.

Plans and specifications, based on the scope below, will be produced for submission to the State Education Department for approval and are incorporated herein by reference.

All work must be performed and installed in accordance with applicable laws, rules, regulations, codes, and ordinances of New York State.

ECM 1: LED Lighting and Lighting Controls Upgrade

Table A-1.1 is a summary of the facilities included for lighting and lighting controls upgrades.

Building	
Roosevelt High School	Roosevelt Middle School
Centennial Ave Elementary School	Ulysses Byas Elementary School
Washington-Rose Elementary School	

TABLE A-1.1

Scope of Work:

1) Honeywell shall provide all equipment, materials, and labor, for the buildings listed in Table A-1.1, to implement the lighting retrofit project as specified in Exhibit D-5-1: Lighting Line by Line attached hereto and incorporated herein by reference.
2) Coordinate all lighting retrofit activities with Customer's Engineer or Customer's designated representative to minimize disruptions.
3) Properly dispose of and recycle replaced fixtures and lamps and provide a certificate to the Customer.
4) Ensure all work meets applicable codes and standards.
5) Repair or replacement of fixture lenses is not included (unless noted otherwise in Exhibit D-5-1).
6) Provide training to Customer operating and maintenance personnel.
7) The upgrades included in the contract are limited to those listed in Exhibit D-5-1; Honeywell shall provide a price for any additional work at the written request of the Customer.
8) The customer shall contact the manufacturer directly for warranty replacement lamps and ballasts after the initial installation period is complete, any labor associated with the replacement after the initial installation is the responsibility of the customer.
9) At completion of the work, the Customer will be supplied with 2% of the lamps and ballasts for maintenance stock.
10) The warranty for the lighting is as follows:
    a) UL type B linear LED lamps (2',3' and 4' T8) are covered by a manufacturer warranty for a period of ten (10) years.
    b) UL type B linear LED T5 lamps are covered by a manufacturer warranty for a period of ten (10) years.
    c) UL type C linear T8 lamps are covered by a manufacturer warranty for a period of ten (10) years.
    d) Screw in PAR LED lamps are covered by a manufacturer warranty for a period of three (3) years.
    e) Screw in A-Line LED and MR16 LED lamps are covered by a manufacturer warranty for a period of three (3) years.
    f) Screw in Corn Cob LED lamps are covered by a manufacturer warranty for a period of five (5) years.
    g) Biax LED linear lamps are covered by a manufacturer warranty for a period of (5) years.

h) LED fixture drivers/new LED fixtures are covered by a manufacturer warranty for a period of five (5) to ten (10) years.
   i. New LED recessed can kits, round kits and panel kits are covered by a manufacturer warranty for a period of five (5) years.
   ii. New LED highbay fixtures are covered by a manufacturer warranty for a period of five (5) years.
   iii. New LED standard wrap and flat panel troffer fixtures by Maxlite are covered by a manufacturer warranty for a period of ten (10) years
   iv. New LED vanity fixtures by Maxlite are covered by a manufacturer warranty for a period of five (5) years
   v. New LED flood and shoe box exterior fixtures by Maxlite are covered by a manufacturer warranty for a period of ten (10) years.
   vi. New LED canopy, cylinder, wall jar and wall pack fixtures by Maxlite, Brownlee, Green Creative and Cooper are covered by a manufacturer warranty for a period of five (5) years.

i) LED battery backup Micro Inverters are covered by a manufacturer warranty for a period of five (5) years.
j) LED half circle retrofit kits by LED LLC/Remphos are covered by a manufacturer warranty for a period of ten (10) years.
k) Controls components by Lutron and Vendmiser are covered by a manufacturer warranty for a period of five (5) years.
l) Wireless remote switches by Douglas Lighting Controls are covered by a manufacturer warranty for a period of two (2) years.

ECM 2: Boiler Plant Upgrades

Building	HOT WATER BOILERS							
	Boiler Make	Boiler Model	Qty	Input MBH	Fuel	Estimated Efficiency	Burner Make	Burner Model
Roosevelt HS	Riello	Array AR 4000	3	4,000	Natural Gas	90%	Integral	
	Riello	Array AR 3000	1	3,000	Natural Gas	90%	Integral	
Roosevelt MS	Riello	Array AR 4000	3	4,000	Natural Gas	90%	Integral	
Washington-Rose ES	Riello	Array AR 4000	2	4,000	Natural Gas	90%	Integral	

Table A-2.1

Scope of Work

1) Demolish and dispose of the existing hot water boilers, associated piping, boiler burners and control panel.
2) Provide hot water boilers as shown in the Table A-2.1.
3) Provide power wiring and reconnection of existing control wiring.
4) Initial water treatment required for boilers start-up.
5) Furnish and install neutralizing kits.
6) Rigging and setting in place the above described new equipment.
7) Reuse existing concrete pads or extend to fit new equipment as required per code.
8) Install new AL29-4C double wall stack for each boiler. PVC venting per manufacturer's requirements.
9) Roof flashing as required.
10) Combustion air louver, damper, and actuators to be interlocked with boiler operation.
11) Insulate new piping and existing insulation damaged during construction.
12) Fire detection or tie-in to existing fire alarm is not included.
13) Boiler room modifications such as floor drains and surface painting are excluded.
14) Start-up, test, and commission.

ECM 3: DHW Heater Upgrades

Building	DHW HEATERS					
	DHW Heater Make	DHW Heater Model	Qty	Fuel	Storage Gallons (each)	Efficiency
Roosevelt HS	AO Smith	IT-600	2	Indirect	158	90%
Washington-Rose ES	AO Smith	IT-300	2	Indirect	80	90%

Table A-3.1

Scope of Work

1) Disconnect all piping, wiring and control connection.
2) Demolish and legally dispose of existing heaters as required.
3) Furnish and install indirect domestic hot water heater tanks as listed in the Table A-3.1 above.
4) Furnish and install all necessary piping and valves.
5) Reuse existing domestic hot water pumps.
6) Furnish and install all required control and power wiring.
7) Furnish and install all necessary venting.
8) Cap existing natural gas line near existing domestic hot water heaters.
9) Furnish and install new thermostatic mixing valve.
10) Insulate new piping and existing insulation damaged during construction.
11) Start up and commissioning.

ECM 4: Mechanical Upgrades

ECM 4.1 – Chiller Compressor Replacements

The following facilities will be upgraded as part of this project:

Building
Roosevelt Middle School

TABLE A-4.1

The following table lists the number of units identified for replacement.

Compressor Quantity	Serves
2	Air Cooled Chiller #2
1	Air Cooled Chiller #3

TABLE A-4.2

Compressor		Electrical			Qty	Refrigerant	Type
Make	Model	Volts	Phase	Hz			
McQUAY	HSA220QY20YA	400/460	3	50/60	3	134a	Screw Compressor

TABLE A-4.3

Scope of Work

1) Disconnect wiring and control connections to the compressors.
2) Remove and dispose of existing compressors.
3) Furnish and install new compressors per Tables A-4.2 and A-4.3 above or equal per manufacturers recommendations.
4) Furnish and install new filters, dryers, cores, sight glasses, suction strainer, valves, and oil separator.
5) Adhere to all applicable regulations regarding recovery and recycling of refrigerant.
6) Reconnect to existing supports.

7) Reconnect control and power wiring.
8) Start up and commissioning.

ECM 4.2 – RTU Compressor Replacements

The following facilities will be upgraded as part of this project:

Building
Ulysses Byas Elementary School

TABLE A-4.4

The following table lists the number of units identified for replacement.

Compressor Quantity	Serves
26	RTU-1,2,3,4,5

TABLE A-4.5

Compressor		Electrical			Refrigerant	Type
Make	Model	Volts	Phase	Hz		
Copland	ZR16M3-TWD-551	460	3	60	R22	Scroll Compressor
Copland	ZR12M3-TWD-551	460	3	60	R22	Scroll Compressor

TABLE A-4.6

Scope of Work
1) Disconnect wiring and control connections to the compressor.
2) Remove and dispose of existing compressor.
3) Furnish and install new compressors per Tables A-4.5 and A-4.6 above or equal per manufacturers recommendations.
4) Furnish and install new filters, dryers, cores, sight glasses, suction strainer, valves, and oil separator.
5) Adhere to all applicable regulations regarding recovery and recycling of refrigerant.
6) Reconnect to existing supports.
7) Reconnect control and power wiring.
8) Start up and commissioning.

ECM 4.3 – AC Unit Replacements

The following facilities will be upgraded as part of this project:

Building	
Roosevelt Middle School	Centennial Ave Elementary School

TABLE A-4.7

The following table lists the number of units identified for replacement.

Location	Make	Outdoor Model	Indoor Model	Zones	EER	Serves
Roosevelt Middle School	LG	ARUN024GSS4	ARNU123SJA4	2 Interior Units 1 Condensing Unit	15.8	IT Closets
Centennial Ave Elementary School	LG	ARUN038GSS4	ARNU123SJA4	3 Interior Units 1 Condensing Unit	13.7	IT Closets

TABLE A-4.8

Scope of Work

1) Disconnect wiring and control connections to the Split AC Units.
2) Remove and dispose of existing units.
3) Furnish and install new Split AC Units per Tables A-4.7 and A-4.8 above or equal per manufacturers recommendations.
4) Adhere to all applicable regulations regarding recovery and recycling of refrigerant.
5) Reconnect control and power wiring.
6) Start up and commissioning.

ECM 4.4 – Chilled Water Pump Replacement

The following facilities will be upgraded as part of this project:

Building
Centennial Ave Elementary School

TABLE A-4.9

The following table lists the number of units identified for replacement.

Pump Quantity	HP	Serves	GPM	Head FT
2	15	Chilled Water	450	75

TABLE A-4.10

Scope of Work

1) Disconnect piping, power and control wiring from the existing pump and motor.
2) Remove and dispose of existing pump and motor.
3) Reconfigure piping as required for the new configuration.
4) Furnish and install new pumps with NEMA Premium Efficiency motors as described in Table A-4.10 above.
5) Align couplings to EASA standards.
6) Furnish and install variable frequency drives on the motors as describe in Table A-4.10 above.
7) Furnish and install power and control wiring for the new variable frequency drives.
8) Provide all available variable frequency drive control points for integration into the Building Management System.
9) Rigging and setting in place the above described new equipment.
10) Measure and verify the pre- and post-retrofit voltage, amperage, and revolutions per minute (RPM).
11) Provide startup, testing and commissioning.

ECM 5: Install De-Stratification Fans

Building	Location	Make & Model	Fan Count
Roosevelt HS	Gymnasium	Airius Air Pear 25	8
	Aux. Gymnasium	Airius Air Pear 25	5
Roosevelt MS	Gymnasium	Airius Air Pear 25	6
Centennial Ave ES	Gymnasium	Airius Air Pear 25	4
Ulysses Byas ES	Gymnasium	Airius Air Pear 25	4

Washington Rose ES	Gymnasium	Airius Air Pear 25	4

TABLE A-5.1

Scope of Work:

1) Furnish and install Airius de-stratification fans, or equivalent, as detailed in Table A-5.1 above to force warm air down to the floor during the heating season.
2) Provide required power wiring, speed, and isolation switches.
3) Provide startup, testing and commissioning.

ECM 6: Building Management System Upgrades

Honeywell shall provide necessary equipment, materials, and labor to implement the following Building Management System (BMS) upgrades for the facilities listed in Table A-6.1.

Building	
Roosevelt High School	Roosevelt Middle School
Centennial Ave Elementary School	Ulysses Byas Elementary School
Washington-Rose Elementary School	

TABLE A-6.1

District-Wide BMS Server

Reconfigure one of the existing Niagara 4 Supervisors to establish a District-wide BMS on a customer-provided virtual server. Provide addition Niagara licenses as needed. Graphics, alarming, and trending for all buildings will reside in the new district wide BMS supervisor. The following graphic screens shall be added:

- District Welcome Page
- Equipment summary tables by equipment type for each building
- Floor plan layouts with links to equipment screens
- Contract M&V parameters

Roosevelt High School

- **New Boiler Integration**

  Provide BACnet integration for three (3) new condensing boilers that will be installed as part of this project. Provide a minimum of 10 points per boiler.

  Additional Scope Details:
  - Furnish controls and instrumentation as necessary to accomplish the design intent described, including controllers, sensors, end-devices.
  - Furnish integration labor as necessary to accomplish the design intent described, including communication wiring, programming, graphics.

- **Existing Chiller Integration**

  Furnish and install new BACnet interface cards for two (2) existing chillers. Integrate the chillers into the BMS. Provide a minimum of 10 points per chiller.

  Additional Scope Details:
  - Furnish controls and instrumentation as necessary to accomplish the design intent described, including controllers, sensors, end-devices.

- Furnish integration labor as necessary to accomplish the design intent described, including communication wiring, programming, graphics.

- **Daiken VFV Integration:**
  Provide BACnet Integration for fifty-two (52) existing Daiken VFV split units into the existing building management system and include new graphics to provide enable, status and setpoint control for terminal units throughout the school building. Provide a minimum of 5 points per split unit.

- **Energy Recovery Unit Integration Upgrade:**
  Reconfigure the existing BACnet Integrations for nineteen (19) existing energy recovery units to expose all available monitoring points. New points shall be integrated into the existing building management system and new graphics shall be provided.

- **Demand Control Ventilation: Library AHU**
  Furnish and install one (1) new space CO_2 sensor in the Library and implement Demand Control Ventilation programming.

  Additional Scope Details:
  - Furnish controls and instrumentation as necessary to accomplish the design intent described, including controllers, sensors, end-devices.
  - Furnish integration labor as necessary to accomplish the design intent described, including communication wiring, programming, graphics.

- **Retro-Commission Existing JCI DDC System**
  Provide point-to-point checkout and functional testing for existing JCI DDC equipment as per the existing sequence of operations. The following is a list of equipment currently controlled by the JCI DDC system that will be retro-commissioned and integrated into the new Tridium Niagara N4 JACE Network Controllers:

Equipment	Quantity
Dual Temperature Plant	1
Air Handling Units (AHUs)	13
Energy Recovery Units (ERUs)	19
Unit Ventilators (UVs)	87
Finned Tube Radiation Zones (FTRs)	72
Fan Coil Units	13
Exhaust Fans (EFs)	38
Relief Damper	25

  Additional Scope Details:
  - Provide a deficiency list of defective mechanical components.
  - Repair existing control components as needed to provide a complete functional system.

- **Control Sequence Upgrades**
  Provide programming to implement the following sequences of operation:
    - Boiler Plants
      - Hot Water Reset

        - Morning Hot Water Boost
        - Unoccupied OAT Lockout
        - Unoccupied Hot Water Offset
        - Differential Pressure Reset
    - Chilled Water Plants
        - Chilled Water Reset
        - Unoccupied OAT Lockout
        - Differential Pressure Reset
    - Single Zone Air Handling Units
        - Optimized Start / Stop
        - Morning Warmup / Cooldown
        - Discharge Air Reset
        - Demand-Based VFD Control
    - Terminal Units
        - Optimized Start / Stop
        - Morning Warmup / Cooldown
        - Discharge Air Reset (For Unit Ventilators Only)
        - Classroom Exhaust Fans and Relief Dampers

- **Plug Load Controls**

  Provide Wi-Fi programmable plug load controllers to turn off equipment as per the table below:

PLUG LOAD CONTROLS	
Equipment	**Roosevelt High School**
Medium Printer	7
Charging Cart	13
Copier	3
H/C Water Dispenser	5
Cold Drink Machine	2
Snack Machine	2

  Additional Scope Details:

  - Program Wi-Fi plug load controllers to turn off equipment during unoccupied periods as described in Exhibit D-1 & D-2.
  - Customer IT Department will provide a reliable Wi-Fi network on which the Wi-Fi plug load controllers will be programmed and controlled.

Roosevelt Middle School

- **New Boiler Integration**

  Provide BACnet integration for three (3) new condensing boilers that will be installed as part of this project.

  Additional Scope Details:

  - Furnish controls and instrumentation as necessary to accomplish the design intent described, including controllers, sensors, end-devices.
  - Furnish integration labor as necessary to accomplish the design intent described, including communication wiring, programming, graphics.

- **Existing Chiller Integration**

Furnish and install new BACnet interface cards for three (3) existing chillers. Integrate the chillers into the BMS. Provide a minimum of 10 points per chiller.

Additional Scope Details:

- Furnish controls and instrumentation as necessary to accomplish the design intent described, including controllers, sensors, end-devices.
- Furnish integration labor as necessary to accomplish the design intent described, including communication wiring, programming, graphics.

- **Exhaust Fan Control Upgrades**

Provide new DDC controls two (2) exhaust fans serving the Lobby area. These fans currently have manual controls. Provide new BMS graphics and schedules. Minimum control points shall include:

Exhaust Fan	AI	AO	DI	DO
Fan Enable				2
Fan Status			2	

Additional Scope Details:

- Furnish controls and instrumentation as necessary to accomplish the design intent described, including controllers, sensors, end-devices.
- Furnish integration labor as necessary to accomplish the design intent described, including communication wiring, programming, graphics.

- **Retro-Commission Existing JCI DDC System**

Provide point-to-point checkout and functional testing for existing JCI DDC equipment as per the existing sequence of operations. The following is a list of equipment currently controlled by the JCI DDC system that will be retro-commissioned and integrated into the new Tridium Niagara N4 JACE Network Controllers:

Equipment	Quantity
Dual Temperature Plant	1
Air Handling Units (AHUs)	11
VAV Boxes	164
Finned Tube Radiation Zones (FTRs)	7
Fan Coil Units	17
Exhaust Fans (EFs)	23

Additional Scope Details:

- Provide a deficiency list of defective mechanical components.
- Repair existing control components as needed to provide a complete functional system.

- **Control Sequence Upgrades**

Provide programming to implement the following sequences of operation:

  - Boiler Plants
    - Hot Water Reset
    - Morning Hot Water Boost

        - Unoccupied OAT Lockout
        - Unoccupied Hot Water Offset
        - Differential Pressure Reset
    - Chilled Water Plants
        - Chilled Water Reset
        - Unoccupied OAT Lockout
        - Differential Pressure Reset
    - VAV Air Handling Units
        - Optimized Start / Stop
        - Morning Warmup / Cooldown
        - Discharge Air Reset
        - Static Pressure Reset
    - Single Zone Air Handling Units
        - Optimized Start / Stop
        - Morning Warmup / Cooldown
        - Discharge Air Reset
        - Demand-Based VFD Control
    - Terminal Units
        - Optimized Start / Stop
        - Morning Warmup / Cooldown
        - Classroom Exhaust Fans and Relief Dampers

- **Plug Load Controls**

  Provide Wi-Fi programmable plug load controllers to turn off equipment as per the table below:

PLUG LOAD CONTROLS	
Equipment	**Roosevelt Middle School**
Projector	2
Medium Printer	15
Charging Cart	8
Copier	1
H/C Water Dispenser	1

  Additional Scope Details:

  - Program Wi-Fi plug load controllers to turn off equipment during unoccupied periods as described in Exhibit D-1 & D-2.
  - Customer IT Department will provide a reliable Wi-Fi network on which the Wi-Fi plug load controllers will be programmed and controlled.

Centennial Ave Elementary School

- **Existing Chiller Integration**

  Furnish and install new BACnet interface card for one (1) existing chiller. Integrate the chiller into the BMS. Provide a minimum of 10 points.

  Additional Scope Details:

  - Furnish controls and instrumentation as necessary to accomplish the design intent described, including controllers, sensors, end-devices.
  - Furnish integration labor as necessary to accomplish the design intent described, including communication wiring, programming, graphics.

- **Chilled Water Plant Upgrades**
  Furnish and install new DDC controls for a new chilled water pump and VFD that will be installed as part of this project. Provide new graphics and programming for pump failover and rotation schedule. Minimum control points shall include:

Chilled Water Pump	AI	AO	DI	DO
Pump Enable				1
Pump Status			1	
Pump Speed		1		

  Additional Scope Details:
  - Furnish controls and instrumentation as necessary to accomplish the design intent described, including controllers, sensors, end-devices.
  - Furnish integration labor as necessary to accomplish the design intent described, including communication wiring, programming, graphics.

- **Demand Control Ventilation: New Addition Gym RTU-2**
  Furnish and install two (2) new space CO_2 sensors in the New Addition Gym and implement Demand Control Ventilation programming.

  Additional Scope Details:
  - Furnish controls and instrumentation as necessary to accomplish the design intent described, including controllers, sensors, end-devices.
  - Furnish integration labor as necessary to accomplish the design intent described, including communication wiring, programming, graphics.

- **Retro-Commission Existing JCI DDC System**
  Provide point-to-point checkout and functional testing for existing JCI DDC equipment as per the existing sequence of operations. The following is a list of equipment currently controlled by the JCI DDC system that will be retro-commissioned and integrated into the new Tridium Niagara N4 JACE Network Controllers:

Equipment	Quantity
Dual Temperature Plant	1
Rooftop Units (RTUs)	2
Air Handling Units (AHUs)	3
VAV Boxes	75
Finned Tube Radiation Zones (FTRs)	36
Fan Coil Units	3
Unit Heaters	5
Exhaust Fans (EFs)	9

  Additional Scope Details:
  - Provide a deficiency list of defective mechanical components.

- Repair existing control components as needed to provide a complete functional system.

▫ **Control Sequence Upgrades**

Provide programming to implement the following sequences of operation:

- Boiler Plants
  - Hot Water Reset
  - Morning Hot Water Boost
  - Unoccupied OAT Lockout
  - Unoccupied Hot Water Offset
  - Differential Pressure Reset
- Chilled Water Plants
  - Chilled Water Reset
  - Unoccupied OAT Lockout
  - Differential Pressure Reset
- VAV Air Handling Units
  - Optimized Start / Stop
  - Morning Warmup / Cooldown
  - Discharge Air Reset
  - Static Pressure Reset
- Single Zone Air Handling Units
  - Optimized Start / Stop
  - Morning Warmup / Cooldown
  - Discharge Air Reset
  - Demand-Based VFD Control
- Terminal Units
  - Optimized Start / Stop
  - Morning Warmup / Cooldown
  - Classroom Exhaust Fans and Relief Dampers

▫ **Plug Load Controls**

Provide Wi-Fi programmable plug load controllers to turn off equipment as per the table below:

PLUG LOAD CONTROLS	
Equipment	**Centennial Ave Elementary School**
Projector	2
Medium Printer	3
Charging Cart	8
Copier	1
TV Monitor	1

Additional Scope Details:

- Program Wi-Fi plug load controllers to turn off equipment during unoccupied periods as described in Exhibit D-1 & D-2.
- Customer IT Department will provide a reliable Wi-Fi network on which the Wi-Fi plug load controllers will be programmed and controlled.

Washington Rose Elementary School

▫ **New Boiler Integration**

Provide BACnet integration for two (2) new condensing boilers that will be installed as part of this project.

Additional Scope Details:

- Furnish controls and instrumentation as necessary to accomplish the design intent described, including controllers, sensors, end-devices.
- Furnish integration labor as necessary to accomplish the design intent described, including communication wiring, programming, graphics.

- **Existing Chiller Integration**

  Furnish and install new BACnet interface card for one (1) existing chiller. Integrate the chiller into the BMS. Provide a minimum of 10 points.

  Additional Scope Details:

  - Furnish controls and instrumentation as necessary to accomplish the design intent described, including controllers, sensors, end-devices.
  - Furnish integration labor as necessary to accomplish the design intent described, including communication wiring, programming, graphics.

- **Demand Control Ventilation: Gym AHU-6**

  Furnish and install two (2) new space CO_2 sensors in the Gym and implement Demand Control Ventilation programming.

  Additional Scope Details:

  - Furnish controls and instrumentation as necessary to accomplish the design intent described, including controllers, sensors, end-devices.
  - Furnish integration labor as necessary to accomplish the design intent described, including communication wiring, programming, graphics.

- **Retro-Commission Existing JCI DDC System**

  Provide point-to-point checkout and functional testing for existing JCI DDC equipment as per the existing sequence of operations. The following is a list of equipment currently controlled by the JCI DDC system that will be retro-commissioned and integrated into the new Tridium Niagara N4 JACE Network Controllers:

Equipment	Quantity
Dual Temperature Plant	1
Rooftop Units (RTUs)	2
Air Handling Units (AHUs)	3
VAV Boxes	77
Finned Tube Radiation Zones (FTRs)	14
Unit Heaters	4
Exhaust Fans (EFs)	14

  Additional Scope Details:

  - Provide a deficiency list of defective mechanical components.
  - Repair existing control components as needed to provide a complete functional system.

- **Control Sequence Upgrades**

  Provide programming to implement the following sequences of operation:

  - Boiler Plants
    - Hot Water Reset
    - Morning Hot Water Boost
    - Unoccupied OAT Lockout
    - Unoccupied Hot Water Offset
    - Differential Pressure Reset
  - Chilled Water Plants
    - Chilled Water Reset
    - Unoccupied OAT Lockout
    - Differential Pressure Reset
  - VAV Air Handling Units
    - Optimized Start / Stop
    - Morning Warmup / Cooldown
    - Discharge Air Reset
    - Static Pressure Reset
  - Single Zone Air Handling Units
    - Optimized Start / Stop
    - Morning Warmup / Cooldown
    - Discharge Air Reset
    - Demand-Based VFD Control
  - Terminal Units
    - Optimized Start / Stop
    - Morning Warmup / Cooldown
    - Classroom Exhaust Fans and Relief Dampers

- **Plug Load Controls**

  Provide Wi-Fi programmable plug load controllers to turn off equipment as per the table below:

PLUG LOAD CONTROLS	
Equipment	**Washington-Rose Elementary School**
Medium Printer	19
Charging Cart	5
Smartboard	34
Vending Machine	1

  Additional Scope Details:

  - Program Wi-Fi plug load controllers to turn off equipment during unoccupied periods as described in Exhibit D-1 & D-2.
  - Customer IT Department will provide a reliable Wi-Fi network on which the Wi-Fi plug load controllers will be programmed and controlled.

Ulysses BYAS Elementary School

- **Existing Chiller Integration**

  Furnish and install new BACnet interface card for one (1) existing chiller. Integrate the chiller into the BMS. Provide a minimum of 10 points.

Additional Scope Details:

- Furnish controls and instrumentation as necessary to accomplish the design intent described, including controllers, sensors, end-devices.
- Furnish integration labor as necessary to accomplish the design intent described, including communication wiring, programming, graphics.

- **Demand Control Ventilation: Gym RTU-5**

  Furnish and install two (2) new space CO_2 sensors in the Gym and implement Demand Control Ventilation programming.

  Additional Scope Details:

  - Furnish controls and instrumentation as necessary to accomplish the design intent described, including controllers, sensors, end-devices.
  - Furnish integration labor as necessary to accomplish the design intent described, including communication wiring, programming, graphics.

- **Retro-Commission Existing JCI DDC System**

  Provide point-to-point checkout and functional testing for existing JCI DDC equipment as per the existing sequence of operations. The following is a list of equipment currently controlled by the JCI DDC system that will be retro-commissioned and integrated into the new Tridium Niagara N4 JACE Network Controllers:

Equipment	Quantity
Boiler Plant	1
Rooftop Units (RTUs)	5
VAV Boxes	80
Finned Tube Radiation Zones (FTRs)	13
Exhaust Fans (EFs)	8

  Additional Scope Details:

  - Provide a deficiency list of defective mechanical components.
  - Repair existing control components as needed to provide a complete functional system.

- **Control Sequence Upgrades**

  Provide programming to implement the following sequences of operation:

  - Boiler Plants
    - Hot Water Reset
    - Morning Hot Water Boost
    - Unoccupied OAT Lockout
    - Unoccupied Hot Water Offset
    - Differential Pressure Reset
  - Chilled Water Plants
    - Chilled Water Reset
    - Unoccupied OAT Lockout
    - Differential Pressure Reset
  - VAV Air Handling Units
    - Optimized Start / Stop
    - Morning Warmup / Cooldown

        - Discharge Air Reset
        - Static Pressure Reset
    - Single Zone Air Handling Units
        - Optimized Start / Stop
        - Morning Warmup / Cooldown
        - Discharge Air Reset
        - Demand-Based VFD Control
    - Terminal Units
        - Optimized Start / Stop
        - Morning Warmup / Cooldown
        - Classroom Exhaust Fans and Relief Dampers

- **Plug Load Controls**

  Provide Wi-Fi programmable plug load controllers to turn off equipment as per the table below:

PLUG LOAD CONTROLS	
Equipment	**Ulysses Byas Elementary School**
Medium Printer	20
Charging Cart	6
Copier	2

Additional Scope Details:

- Program Wi-Fi plug load controllers to turn off equipment during unoccupied periods as described in Exhibit D-1 & D-2.
- Customer IT Department will provide a reliable Wi-Fi network on which the Wi-Fi plug load controllers will be programmed and controlled.

ECM 7: Building Envelope Improvements

The following facilities will be upgraded as part of this project:

Building	
Roosevelt High School	Roosevelt Middle School
Centennial Ave Elementary School	Ulysses Byas Elementary School
Washington-Rose Elementary School	

TABLE A-7.1

Scope of Work:

1) Honeywell shall provide all equipment, materials, and labor to implement the building envelope improvements detailed below in Table A-7.2. Coordinate all retrofit activities with all building personnel to minimize disruptions.
2) No painting, patching, door, door operator, or floor repair is included, unless otherwise damaged by Honeywell during installation.

Task	Centennial Ave Elementary School	Roosevelt High School	Roosevelt Middle School	Ulysses Byas Elementary School	Washington-Rose Elementary School
Buck Frame Air Sealing (LF)		8			
Door - Install Jamb Spacer (Units)	3				3
Door Weather Striping - Doubles (Units)	12	34	10	15	13
Door Weather Stripping - Singles (Units)	5	14	8		4
Overhang Air Sealing (LF)		19	46		
Overhang Air Sealing (SF)		20			
Roll-Up Door Weather Stripping (Units)			2		
Roof-Wall Intersection Air Sealing (LF)		554			

TABLE A-7.2

ECM 8: Pipe Insulation

The following facilities will be upgraded as part of this project:

Building	
Roosevelt High School	Roosevelt Middle School
Centennial Ave Elementary School	Ulysses Byas Elementary School
Washington-Rose Elementary School	

TABLE A-8.1

Scope of Work:

1) Install pipe insulation as detailed in Table A-8.2 thru A-8.3 below.
2) Insulation is based on having a conductivity (k) not exceeding 0.27 BTU per inch/hr·ft^2·°F.
3) Insulation will be in conformance with the Energy Conservation Construction Code of New York State in effect as of the date of contract signature.

Heating Hot Water - Linear Feet of Pipe [ft] per Pipe Diameter Size [in]

Building	Air Separator Tank	6" Diameter	5" Diameter	4" Diameter	3" Diameter	2.5" Diameter
Centennial Avenue Elementary School	17.7	-	-	96.8	20.0	-
Washington-Rose Elementary School	-	-	35.8	58.0	38.2	-
Ulysses Byas Elementary School	-	-	4.0	44.4	10.0	-
Roosevelt Middle School	-	7.7	65.6	43.8	59.2	-
Roosevelt High School	-	23.1	-	76.4	25.0	28.5
Totals	**17.7**	**30.8**	**105.4**	**319.4**	**152.4**	**28.5**

TABLE A-8.2

MINIMUM PIPE INSULATION (thickness in inches)							
FLUID OPERATING TEMPERATURE RANGE	INSULATION CONDUCTIVITY		NOMINAL PIPE DIAMETER				
	Conductivity Btu-in./(h-ft^2-°F)	Mean Rating Temperature, °F	≤ 1.0"	1.0" to < 1.5"	1.5" to < 4.0"	4.0" to < 8.0"	≥ 8.0"
>350°F	0.32-0.34	250	4.5	5.0	5.0	5.0	5.0
251°F - 350°F	0.29-0.32	200	3.0	4.0	4.5	4.5	4.5
201°F - 250°F	0.27-0.30	150	2.5	2.5	2.5	3.0	3.0
141°F - 200°F	0.25-0.29	125	1.5	1.5	2.0	2.0	2.0
105°F - 140°F	0.22-0.28	100	1.0	1.0	1.5	1.5	1.5

TABLE A-8.3

ECM 9: Install Walk In Freezer / Cooler Controllers

The following facilities will be upgraded as part of this project:

Building	
Roosevelt High School	Roosevelt Middle School
Centennial Ave Elementary School	Ulysses Byas Elementary School
Washington-Rose Elementary School	

TABLE A-9.1

The buildings and quantities in the project scope are detailed in the following table.

Building	Walk-In Coolers	Walk-In Freezers
Roosevelt HS	2	2
Roosevelt MS	1	1
Centennial Ave ES	1	1
Ulysses Byas ES	1	1
Washington Rose ES	1	1

TABLE A-9.2

Scope of Work:

Roosevelt High School:

1) Provide four (4) zones of energy saving CoolTrol refrigeration controls or approved equal to cycle temperature and evaporator fans.
2) Replace two (2) existing shaded-pole motors with two (2) high efficiency EC motors in evaporators.
3) Install dewpoint-based pulse control for anti-sweat door heaters on one (1) freezer door and one (1) cooler door.
4) One (1) electric defrost will be electronically controlled.
5) Install four (4) current transducers and four (4) door sensors.
6) Customer is responsible for LAN drops at each school location
7) Install wiring.
8) Test and commission.

Roosevelt Middle School:

1) Provide two (2) zones of energy saving CoolTrol refrigeration controls or approved equal to cycle temperature and evaporator fans.
2) Replace four (4) existing shaded-pole motors with four (4) high efficiency EC motors in evaporators.
3) Install dewpoint-based pulse control for anti-sweat door heaters on one (1) freezer door and one (1) cooler door.
4) One (1) electric defrost will be electronically controlled.
5) Install two (2) current transducers and two (2) door sensors.
6) Customer is responsible for LAN drops at each school location
7) Install wiring.
8) Test and commission.

Centennial Ave Elementary School:

1) Provide two (2) zones of energy saving CoolTrol refrigeration controls or approved equal to cycle temperature and evaporator fans.

2) Install dewpoint-based pulse control for anti-sweat door heaters on one (1) freezer door.
3) One (1) electric defrost will be electronically controlled.
4) Install two (2) current transducers and two (2) door sensors.
5) Customer is responsible for LAN drops at each school location
6) Install wiring.
7) Test and commission.

Ulysses Byas Elementary School:
1) Provide two (2) zones of energy saving CoolTrol refrigeration controls or approved equal to cycle temperature and evaporator fans.
2) Replace four (4) existing shaded-pole motors with four (4) high efficiency EC motors in evaporators.
3) Install dewpoint-based pulse control for anti-sweat door heaters on one (1) freezer door and one (1) cooler door.
4) One (1) electric defrost will be electronically controlled.
5) Install two (2) current transducers and two (2) door sensors.
6) Customer is responsible for LAN drops at each school location
7) Install wiring.
8) Test and commission.

Washington-Rose Elementary School:
1) Provide two (2) zones of energy saving CoolTrol refrigeration controls or approved equal to cycle temperature and evaporator fans.
2) Replace four (4) existing shaded-pole motors with four (4) high efficiency EC motors in evaporators.
3) Install dewpoint-based pulse control for anti-sweat door heaters on one (1) freezer door and one (1) cooler door.
4) One (1) electric defrost will be electronically controlled.
5) Install two (2) current transducers and two (2) door sensors.
6) Customer is responsible for LAN drops at each school location
7) Install wiring.
8) Test and commission.

Exclusions:
All LAN drops required for connection to the monitoring system / controllers are the responsibility of the customer.

ECM 10: Install Solar PV Systems

Building	SOLAR PHOTOVOLTAIC SYSTEMS	
	Total DC kW Rating	System Type
Roosevelt High School	585.9	Roof Mounted
	319.4	Carport
Roosevelt Middle School	401.1	Roof Mounted
	1,156.5	Carport
Centennial Ave Elementary School	145.5	Roof Mounted
	297.2	Carport
Ulysses Byas Elementary School	210.5	Roof Mounted
Washington-Rose Elementary School	179.5	Roof Mounted

TABLE A-10.1

Scope of Work:

Pre-Construction:

1) Complete all required interconnection application documentation with the local utility.
2) Coordinate interconnection with the local utility - there are no electrical upgrades or redundant relays included in this project. Existing utility and school electrical service and equipment is assumed to be adequate for solar installation. Any upgrades required for interconnection will be paid for by the Customer.
3) Provide all required labor, material, and equipment required to install the solar photovoltaic systems detailed in Table A-10.1 above.

Roof Structural:

1) No roof structural work is included in this scope of work.

Construction:

1) All wiring to meet the requirements of the 2020 National Electrical Code.
2) Solar modules are to be bankable quality.
3) Inverters are to be bankable quality, balance of system to be per 2020 National Electric Code.
4) Interconnection to building system to be per 2020 National Electric Code lineside tap.
5) Removal all debris and dispose of properly.
6) All necessary storage.
7) Install Power Dash Monitoring System or equal connected to the internet for remote access.
8) Customer shall provide IP addresses for the monitoring system at each location.
9) Provide required training
10) Manufacturer provides a ten (10) year inverter warranty.

Exclusions:

1) Utility Charges or CESIR Fee for work performed by the utility.
2) Utility required protective relay.
3) Tree removal or pruning.
4) Roof modifications other than ballast sheets.

PART 2 – GENERAL

A. GENERAL CONDITIONS

1. Honeywell is not responsible for bringing existing lighting/electrical systems up to code.
2. The lighting warranty is defined under ECM 1. The warranty operates by the Customer sending the old equipment back to the manufacturer and in return new equipment will be provided to be installed by the Customer's work force.
3. If Honeywell encounters any materials or substances classified as toxic or hazardous in performance of the Work, including asbestos, Honeywell will notify Customer and will stop work in that area until such area has been made safe by the Customer, or Customer's Representative, at Customer's expense. In the event such conditions cause a delay in Honeywell's performance, Honeywell shall be entitled to recovery of all costs associated with such delay, as well as an extension of time of performance.
4. Where demolition of certain areas of a building are required for removal and installation of equipment and that demolition is included in the scope of work defined herein, Honeywell will make every effort to replace such areas with similar materials as available. If such materials are not available, materials of similar quality will be supplied and installed.
5. Electrical: Honeywell will only be responsible for repairing existing electrical wiring problems that occur within three feet (36 inches) of the device being installed or the nearest wall or ceiling penetration, whichever is smaller.

6. Piping: Honeywell will only be responsible for repairing existing piping problems that occur within two feet (24 inches) of the device being installed or the nearest wall or ceiling penetration, whichever is smaller. Piping includes, but is not limited to, domestic hot and cold water, cooling cold water, heating hot water, condensate, fuel oil, and cooling tower condensing water.
7. Routine Maintenance: Routine maintenance such as vacuuming, coil cleaning and filter change of air handling devices, etc. is the responsibility of the Customer, or as included in Attachment D.
8. Utility Meter: If new utility meters are required, provision and coordination of utility meters is the responsibility of the customer.
9. Remote Access: CUSTOMER is responsible for implementation and costs for remote Honeywell access through CUSTOMER's firewall(s) to the controllers and front-end computer(s) by one (1) remote user designated by Honeywell using one or more of the following processes:
   - TCP/IP Remote Access: A dedicated static IP address, installation and on-going maintenance and subscription and licensing fees for access hardware and software and one (1) station license dedicated to the remote user, or
   - Phone Lines: To be provided by customer for off-site monitoring, up to two (2) lines for each front end, as needed, one (1) line for each separate remote bus, as well as on-going maintenance of the lines.

   If remote access is interrupted, at any time during the Guarantee Term, Honeywell reserves the right to suspend any reporting requirements until remote access has been restored.
10. Efficiency Values: Honeywell will install equipment and lighting components (hereto referred as "equipment") under the scope described herein with specific energy and water efficiency values. The customer is required to replace any failed "equipment" no longer warranted by Honeywell or a Honeywell subcontractor, with "equipment" of equal or greater efficiency for the full contract guarantee term.
11. Limitation of Liability – Security Systems, Fire Alarm Systems and/or Components - Honeywell's total liability for damages of any kind or nature arising out of or relating to any aspect or component of the security or fire alarm systems and/or components provided under this Agreement is limited to $100,000.
12. Honeywell will provide information necessary to apply for utility incentives. Actual dollar amount of incentive will be determined by the Utility and is not guaranteed by Honeywell.
13. The following areas are specifically excluded from this scope of work. Correction of problems in these areas, if required by Federal, State, or local law or ordinance, will be considered additional work and will be chargeable (with approval) to the Customer.
    a. Any work not specifically stated and outlined in this scope of work.
    b. Painting and patching of areas beyond those areas directly related to work.
    c. Existing non-code conditions (examples: existing electrical wiring which requires correction or approval by appropriate inspectors, existing penetrations in need of fire stopping, etc.).
14. Extended Warranties or Service Plans: Honeywell will transfer to the Customer manufacturer warranties and service plans to the extent they extend beyond the two year Honeywell warranty. Following the two year Honeywell warranty the Customer will contact the manufacturer directly for warranty or service issues. Honeywell does not guarantee that the manufacturer or service provider will be available throughout the term of the manufacturer's warranty.

B. RELATED WORK SPECIFIED ELSEWHERE

1. Provision of equipment, material, and labor to provide functional measurement and verification systems coordinated under Attachment D – Guarantee and Support Services Agreement.

ATTACHMENT B
SOFTWARE LICENSE AGREEMENT

RESERVED

ATTACHMENT C
INSTALLATION SCHEDULE

The Installation Schedule showing the achievement of all major project milestones, tasks and associated responsibilities included in the Scope of Work will be created using Microsoft Project and inserted behind this cover page.

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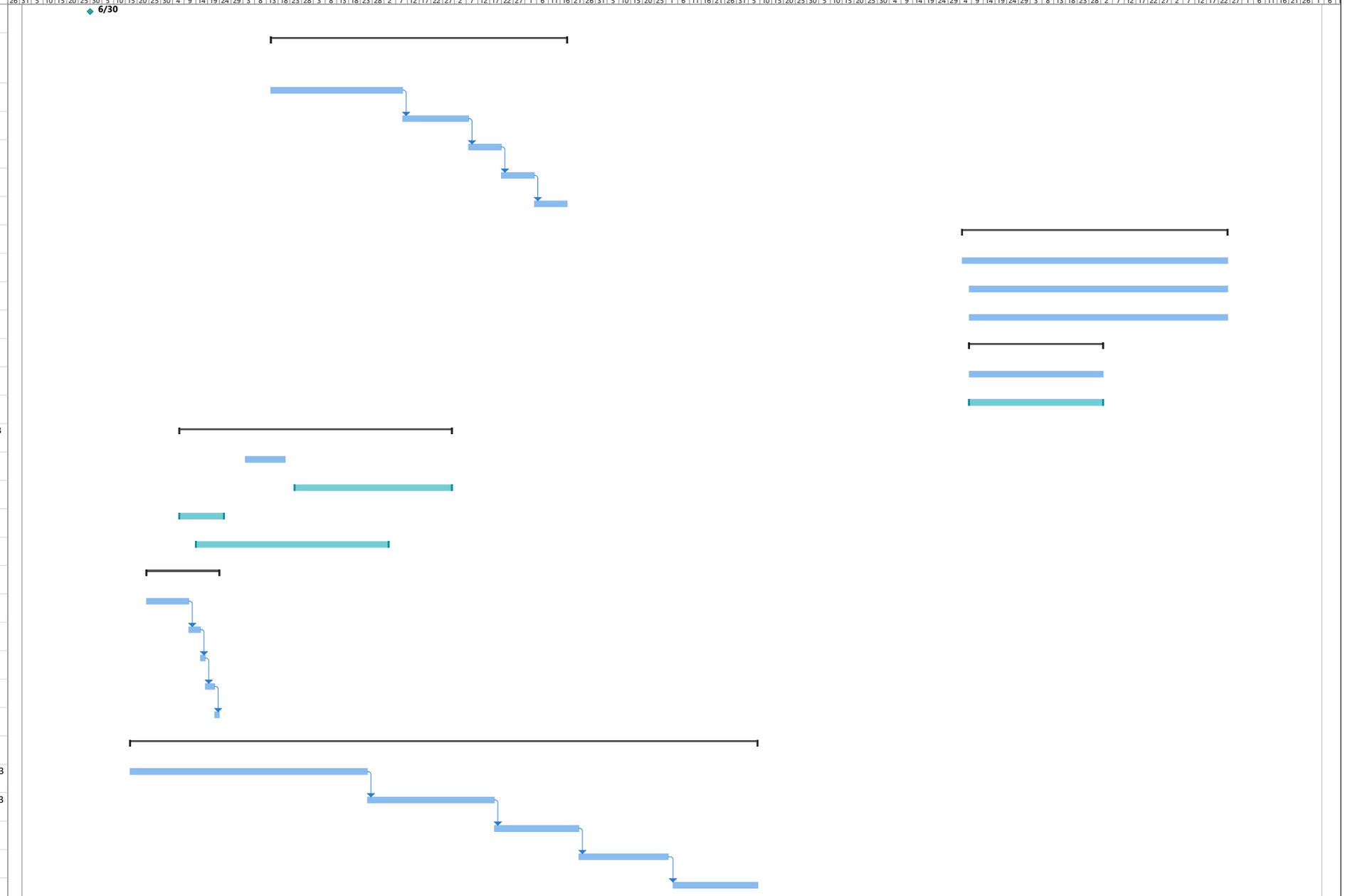
Attachment C Project Schedule - Roosevelt UFSD

ID	Task Name	Duration	Start	Finish
1	**SED Approval and Financing Secured**	0 days	Fri 6/30/23	Fri 6/30/23
2	**ECM 1 LED Lighting and Lighting Controls Upgrades**	**90 days**	**Fri 9/15/23**	**Thu 1/18/24**
3	Roosevelt High School	40 days	Fri 9/15/23	Thu 11/9/23
4	Roosevelt Middle School	20 days	Fri 11/10/23	Thu 12/7/23
5	Centennial Ave Elementary School	10 days	Fri 12/8/23	Thu 12/21/23
6	Ulysses Byas Elementary School	10 days	Fri 12/22/23	Thu 1/4/24
7	Washington-Rose Elementary School	10 days	Fri 1/5/24	Thu 1/18/24
8	**ECM 2 Boiler Plant Upgrades**	**81 days**	**Fri 7/5/24**	**Fri 10/25/24**
9	Roosevelt High School	81 days	Fri 7/5/24	Fri 10/25/24
10	Roosevelt Middle School	80 days	Mon 7/8/24	Fri 10/25/24
11	Washington-Rose Elementary School	80 days	Mon 7/8/24	Fri 10/25/24
12	**ECM 3 DHW Heater Upgrades**	**41 days**	**Mon 7/8/24**	**Mon 9/2/24**
13	Roosevelt High School	41 days	Mon 7/8/24	Mon 9/2/24
14	Washington-Rose Elementary School	41 days	Mon 7/8/24	Mon 9/2/24
15	**ECM 4 Mechanical Upgrades**	**84 days**	**Mon 8/7/23**	**Thu 11/30/23**
16	Roosevelt Middle School	13 days	Mon 9/4/23	Wed 9/20/23
17	Ulysses Byas Elementary School	49 days	Mon 9/25/23	Thu 11/30/23
18	Roosevelt Middle School	15 days	Mon 8/7/23	Fri 8/25/23
19	Centennial Ave Elementary School	60 days	Mon 8/14/23	Fri 11/3/23
20	**ECM 5 Install De-Stratification Fans**	**23 days**	**Mon 7/24/23**	**Wed 8/23/23**
21	Roosevelt High School	14 days	Mon 7/24/23	Thu 8/10/23
22	Roosevelt Middle School	3 days	Fri 8/11/23	Tue 8/15/23
23	Centennial Ave Elementary School	2 days	Wed 8/16/23	Thu 8/17/23
24	Ulysses Byas Elementary School	2 days	Fri 8/18/23	Mon 8/21/23
25	Washington-Rose Elementary School	2 days	Tue 8/22/23	Wed 8/23/23
26	**ECM 6 Building Management System**	**191 days**	**Mon 7/17/23**	**Mon 4/8/24**
27	Roosevelt High School	73 days	Mon 7/17/23	Wed 10/25/23
28	Roosevelt Middle School	38 days	Thu 10/26/23	Mon 12/18/23
29	Centennial Ave Elementary School	26 days	Tue 12/19/23	Tue 1/23/24
30	Washington-Rose Elementary School	28 days	Wed 1/24/24	Fri 3/1/24
31	Ulysses Byas Elementary School	26 days	Mon 3/4/24	Mon 4/8/24



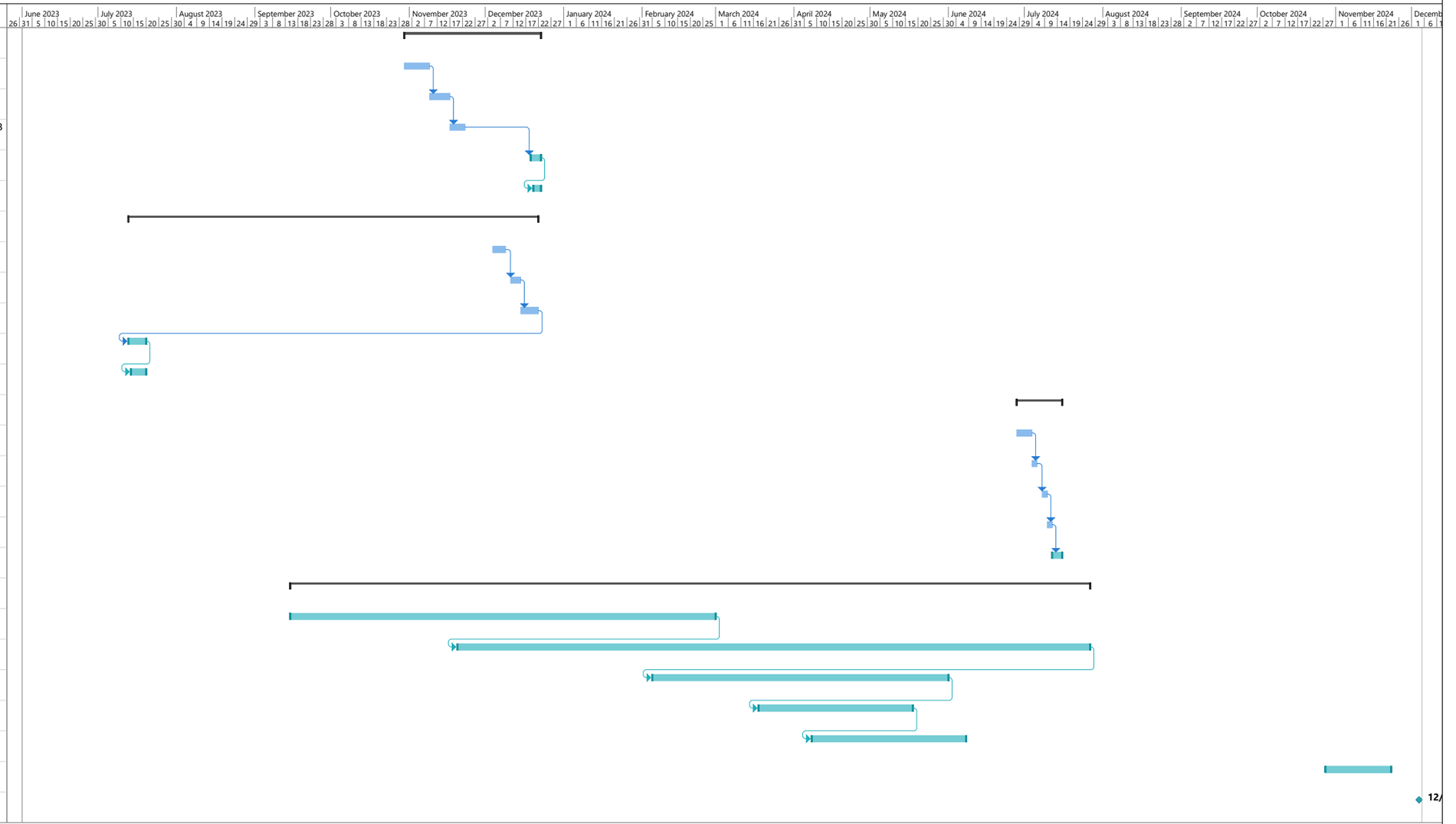
Roosevelt UFSD
Project Schedule

Task | Milestone | Project Summary | Inactive Milestone | Manual Task | Manual Summary Rollup | Start-only | External Tasks | Deadline | Manual Progress
Split | Summary | Inactive Task | Inactive Summary | Duration-only | Manual Summary | Finish-only | External Milestone | Progress

Project Schedule will be adjusted based on actual SED approval and financing dates

Attachment C Project Schedule - Roosevelt UFSD

ID	Task Name	Duration	Start	Finish
32	**ECM 7 Building Envelope Improvements**	**40 days**	**Mon 10/30/2**	**Fri 12/22/23**
33	Roosevelt High School	8 days	Mon 10/30/2	Wed 11/8/23
34	Roosevelt Middle School	6 days	Thu 11/9/23	Thu 11/16/23
35	Centennial Ave Elementary School	4 days	Fri 11/17/23	Wed 11/22/23
36	Washington-Rose Elementary School	4 days	Tue 12/19/23	Fri 12/22/23
37	Ulysses Byas Elementary School	3 days	Wed 12/20/2	Fri 12/22/23
38	**ECM 8 Pipe Insulation**	**116 days**	**Thu 7/13/23**	**Thu 12/21/23**
39	Roosevelt High School	5 days	Mon 12/4/23	Fri 12/8/23
40	Roosevelt Middle School	4 days	Mon 12/11/2	Thu 12/14/23
41	Centennial Ave Elementary School	5 days	Fri 12/15/23	Thu 12/21/23
42	Washington-Rose Elementary School	5 days	Thu 7/13/23	Wed 7/19/23
43	Ulysses Byas Elementary School	4 days	Fri 7/14/23	Wed 7/19/23
44	**ECM 9 Walk In Freezer/Cooler Controllers**	**12 days**	**Fri 6/28/24**	**Mon 7/15/24**
45	Roosevelt High School	4 days	Fri 6/28/24	Wed 7/3/24
46	Roosevelt Middle School	2 days	Thu 7/4/24	Fri 7/5/24
47	Centennial Ave Elementary School	2 days	Mon 7/8/24	Tue 7/9/24
48	Washington-Rose Elementary School	2 days	Wed 7/10/24	Thu 7/11/24
49	Ulysses Byas Elementary School	2 days	Fri 7/12/24	Mon 7/15/24
50	**ECM 10 Install Solar PV Systems**	**226 days**	**Fri 9/15/23**	**Fri 7/26/24**
51	Roosevelt High School	120 days	Fri 9/15/23	Thu 2/29/24
52	Roosevelt Middle School	180 days	Mon 11/20/2	Fri 7/26/24
53	Centennial Ave Elementary School	85 days	Mon 2/5/24	Fri 5/31/24
54	Ulysses Byas Elementary School	45 days	Mon 3/18/24	Fri 5/17/24
55	Washington-Rose Elementary School	45 days	Mon 4/8/24	Fri 6/7/24
56	Walk Through/Punchlist	20 days	Mon 10/28/2	Fri 11/22/24
57	Project Acceptance	0 days	Wed 12/4/24	Wed 12/4/24



Roosevelt UFSD
Project Schedule

Task | Milestone | Project Summary | Inactive Milestone | Manual Task | Manual Summary Rollup | Start-only | External Tasks | Deadline | Manual Progress
Split | Summary | Inactive Task | Inactive Summary | Duration-only | Manual Summary | Finish-only | External Milestone | Progress

Project Schedule will be adjusted based on actual SED approval and financing dates

ATTACHMENT D
GUARANTEE AND SUPPORT SERVICES AGREEMENT
(INCLUDING M&V SERVICES, GUARANTEE TERMS, AND SCHEDULE OF GUARANTEED SAVINGS)

Project Name: Roosevelt UFSD – Energy Performance Contract
Proposal Number: RUFSD121422
Date: 12-14-22

("Honeywell")	**("Customer")**
Honeywell International Inc. 715 Peachtree Street N.E. Atlanta, GA 30308	Roosevelt UFSD 240 Denton Place Roosevelt, NY 11575

Service Location Name(s):

Roosevelt High School	1 Wagner Ave, Roosevelt, NY 11575
Roosevelt Middle School	355 East Clinton Ave, Roosevelt, NY 11575
Centennial Ave Elementary School	140 West Centennial Ave, Roosevelt, NY 11575
Ulysses Byas Elementary School	60 Underhill Ave, Roosevelt, NY 11575
Washington-Rose Elementary School	2 Rose Ave, Roosevelt, NY 11575

Summary - The following summary is for informational purposes only. The specific terms, conditions and other specifications set forth in the details of this Guarantee and Support Services Agreement shall take precedence over this summary.

- ☐ **Preferred Temperature Control Services**
- ☐ **Flex Temperature Control Services**
- ☐ **Preferred Automation Maintenance Services**
- ☐ **Flex Automation Services**
- ☐ **Preferred Fire Alarm Maintenance Services**
- ☐ **Fire Alarm Test and Inspect Services**
- ☐ **Preferred Security System Inspect Services**
- ☐ **Flex Security System Services**
- ☐ **Preferred Mechanical Maintenance Services**
- ☐ **Flex Mechanical Maintenance Services**
- ☒ **Honeywell Forge Predictive Maintenance**
- ☐ **EBI Services**
- ☒ **M&V Services**
- ☐ **Online Services**
- ☐ **Advanced Support**
- ☐ **Site Services**
- ☐ **Honeywell Energy Analysis Reporting**
- ☐ **Air Filter Services**
- ☐ **Water Treatment Services**
- ☐ **Critical Parts Stocking**
- ☐ **Thermography Services**
- ☐ **Emergency Generator Services**
- ☐ **In Suite Services**
- ☐ **Remote Monitoring/Radionics**
- ☐ **Indoor Air Quality Auditing Services**
- ☐ **Service Management Software**
- ☐ **FM Worksite**
- ☒ **Guarantee Special Provisions**
- ☐ **Other/Special Provisions**_____
- ☐ **Honeywell Users Group**
- ☐ **Attune™ Advisory Services - Operations**
- ☐ **Attune™ Advisory Services - Energy Optimization**
- ☐ **Attune™ Advisory Services – Energy Awareness**
- ☐ **Attune™ Advisory Services – Lobby Digital Signage**

Support Services Agreement Term ("Support Services Term"): Eighteen (18) years from the Support Services Effective Date.

Support Services Agreement Effective Date ("Support Services Effective Date"): First (1st) day of the month following the date of Final Project Acceptance of the Work.

Price for Year 1: Twenty-Eight Thousand Seven Hundred Seven Dollars, ($28,707), (plus applicable taxes). See Section A.6.2 for price in subsequent years.

Payment Terms: Quarterly in Advance and payment shall be due within thirty (30) days of invoice date.

☐ Sales/Use Tax will be Invoiced Separately ☐ Sales/Use Tax is Included in the Price ☒ This Sale is Tax Exempt

Honeywell International Inc., through its Honeywell Building Solutions strategic business unit ("Honeywell"), will provide, or cause to be provided, to Customer the services (the "Support Services") set forth in the attached work scope documents in Part B of this Attachment D ("Support Services Scope") with respect to the Service Location(s) in accordance with the Support Services Scope, and the terms and conditions set forth in Part A of this Attachment D, which together with the guarantee terms and Schedule of Guaranteed Savings set forth in Part C and Part D, respectively, of this Attachment D, constitute this Guarantee and Support Services Agreement (the "Support Services Agreement"). This Support Services Agreement is entered into as Attachment D to, and by execution of, the accompanying Honeywell Agreement between Honeywell and Customer (the "Main Agreement"). Together, the Main Agreement and Support Services Agreements are the "Agreement."

Part A – Support Services Terms & Conditions
Part B – Support Services Scope Description, including M&V Services
Part C – Guarantee Terms
Part D – Schedule of Guaranteed Savings
Exhibits - The following Exhibits are attached hereto and are made a part of the Agreements: Exhibit D-1 & D-2 Baseline Operating Parameters & Guarantee Period Operating Parameters Exhibit D-3 Contractual Baseline Conditions, Utility Use, Utility Unit Costs Exhibit D-4 Baseline Regression for Option C Meters Exhibit D-5 Engineered Cost Avoidance Calculations Exhibit D-6 Operational Savings Methodology Exhibit D-7 Detailed M&V Plan

PART A. STANDARD TERMS AND CONDITIONS FOR SUPPORT SERVICES

The following terms and conditions, in Sections A.1 to A.8, apply to all Support Services, including M&V Services.

A.1 Terms Incorporated from Main Agreement

Except as otherwise stipulated in Section A.13 (Honeywell SaaS Terms), the following provisions set forth in the Main Agreement shall apply to the Support Services, save that some may not apply to the SaaS Offering. Where any of the below provisions conflicts with any of the provisions of Section A.13, the provisions of Section A.13 shall prevail to the extent of such inconsistency.

A.1.1 The Patent Indemnity provision in Section 2.3**.**
A.1.2 The Hazardous Substances provision in Section 3.8.
A.1.3 The Taxes provision in Section 3.9.
A.1.4 The Software License provision in Section 3.10.
A.1.5 The Force Majeure provision in Section 5.2.
A.1.6 The Price Adjustment provision in Section 6.1.3.
A.1.7 The Insurance provision in Section 8.2 shall apply through the final completion of the Support Services.
A.1.8 The Indemnity provisions in Article 8.
A.1.9 The Assignment, Governing Law and Miscellaneous provisions in Article 10 and Article 11.
A.1.10 Disputes related to the Support Services shall be resolved in accordance with Article 12 of the Main Agreement.

A.2 Working Hours

A.2.1 Unless otherwise stated and save that this does not apply to the SaaS Offering, all Support Services will be performed during the hours of 8:00am - 4:30pm local time Monday through Friday, excluding federal or state holidays. If for any reason Customer requests Honeywell to perform Support Services outside such hours, any overtime or additional expenses incurred by Honeywell will be billed to and paid by Customer.

A.3 Proprietary Information

A.3.1 All proprietary information (as defined herein) obtained by Customer from Honeywell in connection with this Support Services Agreement will remain the property of Honeywell, and Customer will not divulge such information to any third party or use such information (except as necessary to comply with its obligations under this Agreement) without prior written consent of Honeywell. The term "proprietary information" means confidential or non-public information, including but not limited to, software supplied to Customer, disclosed or made available to Customer by Honeywell. The electronic platform, code and arrangement upon which the legible Energy Savings Calculations are published is “Proprietary.” The provisions set forth in Section 11.2 of the Main Agreement shall apply to the “proprietary information.”

A.3.2 Customer agrees that Honeywell may use non-proprietary information pertaining to the Agreements, and the work or services performed under the Agreements, for press releases, case studies, data analysis, promotional purposes, and other similar documents or statements to be publicly released, as long as Honeywell submits any such document or statement to Customer for its approval, which approval will not be unreasonably withheld. Honeywell may, during and after the term of the Agreements, compile and use, and disseminate in anonymous and aggregated form, all data and information related to building optimization and energy usage obtained in connection with the Agreements. The rights and obligations in this Section A.3 shall survive termination or expiration of the Agreements.

A.4 Limitation of Liability

A.4.1 SAVE FOR THE SAAS OFFERING, TO WHICH SECTION A.13.1.17 SHALL SOLELY APPLY, THE LIMITATIONS OF LIABILITY AND APPLICATION THEREOF, AS SET FORTH IN ARTICLE 2 AND ARTICLE 8 OF THE MAIN AGREEMENT, SHALL APPLY TO THE PROVISION OF THE SUPPORT SERVICES. NOTWITHSTANDING ANY OTHER PROVISION OF THIS AGREEMENT, TO THE EXCLUSION OF THE SAAS OFFERING TO WHICH SECTION A.13.1.17 IS SOLELY APPLICABLE, THE AGGREGATE LIABILITY OF HONEYWELL FOR ANY CLAIMS ARISING OUT OF OR RELATED TO THIS SUPPORT SERVICES AGREEMENT WILL IN NO CASE EXCEED THE ANNUAL SUPPORT SERVICES AGREEMENT PRICE; PROVIDED, HOWEVER, THAT THIS LIMITATION SHALL NOT APPLY TO THE SPECIFIC SAVINGS GUARANTEE OBLIGATIONS OF HONEYWELL SET FORTH IN THIS ATTACHMENT D.

A.5 Coverage of Support Services

A.5.1 Customer agrees to provide Honeywell access to all equipment and software necessary to Honeywell's performance of the Support Services. Honeywell will be free to start and stop all equipment incidental to the operation of the mechanical, control, automation, and life safety system(s) as arranged with Customer's representative.

A.5.2 Honeywell has no obligation to repair or replace non-maintainable parts of any systems, including, but not limited to, ductwork, piping, shell and tube (for boilers, evaporators, condensers, and chillers), unit cabinets, boiler refractory material, heat exchangers, insulating material, electrical wiring, hydronic and pneumatic piping, structural supports and other non-moving parts. Costs to repair or replace such non-maintainable parts will be the sole responsibility of Customer.

A.5.3 Honeywell will not reload software, or make repairs or replacements necessitated by reason of negligence or misuse of any equipment by persons other than Honeywell or its employees, or necessitated by lightning, electrical storm, or other violent weather or by any other cause beyond Honeywell's control. Honeywell will provide such services at Customer's request and at an additional charge.

A.5.4 Honeywell is not responsible for maintaining a supply of, furnishing and/or replacing lost or needed chlorofluorocarbon (CFC) based refrigerants not expressly required to be provided by Honeywell under this Agreement. Customer is solely responsible for the cost of material and labor relating to any such refrigerant.

A.5.5 Honeywell is not obligated to provide replacement software, equipment, components and/or parts that represent a significant betterment or capital improvement to Customer's system(s) hereunder.

A.5.6 Unless otherwise expressly provided in this Support Services Agreement, Customer retains all responsibility for maintaining LANs, WANs, leased lines and/or other communication mediums incidental or essential to the operation of the system(s) or Covered Equipment.

A.6 Terms of Payment

A.6.1 Customer will pay or cause to be paid to Honeywell the full price for the Support Services, as specified on the first-year line of the Support Services Pricing Table (Section A.6.2) and such price may be adjusted, subject to Section A.13.1.19 in relation only to the SaaS Offering, in accordance with this Support Services Pricing Table. Honeywell will submit invoices to Customer in advance for Support Services to be performed during the subsequent billing period, and payment shall be due after Customer's receipt of each such invoice, as set forth in the "Payment Terms" provisions at the beginning of this Attachment D. Payments for Support Services past due more than five (5) days shall accrue interest from the due date to the date of payment at the rate of one and one-half percent (1.5%) per month, compounded monthly, or the highest legal rate, whichever is lower. Customer will pay all attorney and/or collection fees incurred by Honeywell in collecting any past due amounts.

A.6.2 Honeywell may annually adjust the amounts charged for the Support Services provided under the Support Services Agreement as set forth in the schedule below. In addition, Honeywell reserves the right, in its discretion, to increase the price payable by Customer in the event that tariffs (or similar governmental charges) imposed by the United States or other countries result in any increase in the costs that Honeywell used to determine such price. This provision shall be read and construed with the "Economic Surcharges" provision in Section A.13.1.19 in relation only to the SaaS Offering and where there is any conflict, Section A.13.1.19 shall prevail with regard to the SaaS Offering.

YEAR	PRICE
1	$28,707
2	$29,569
3	$30,456
4	$31,370
5	$32,311
6	$33,280
7	$34,279
8	$35,307
9	$36,366
10	$37,457
11	$38,581

YEAR	PRICE
12	$39,738
13	$40,930
14	$42,158
15	$43,423
16	$44,726
17	$46,068
18	$47,450

A.7 Termination

A.7.1 Customer may terminate this Support Services Agreement for cause if Honeywell defaults in the performance of any material term of this Support Services Agreement, or fails or neglects to carry forward the Support Services in accordance with this Support Services Agreement, after giving Honeywell written notice of its intent to terminate. If, within thirty (30) days following receipt of such notice, Honeywell fails to cure such default, Customer may, by written notice to Honeywell, terminate this Support Services Agreement.

A.7.2 In addition to the any other termination rights set out in this Agreement, including in A.13.1.7 (Term, Termination) below, Honeywell may terminate this Agreement for cause (including, but not limited to, Customer's failure to make payments as agreed herein) if Customer breaches this Agreement. If, within thirty (30) days following Honeywell's notice of breach, Customer fails to make the payments then due, or otherwise fails to cure such breach, Honeywell may, by written notice to Customer, terminate this Agreement and recover from Customer payment for Work performed and for losses sustained, including but not limited to, reasonable overhead, profit and applicable damages.

A.7.3 Honeywell may terminate this Support Services Agreement in the event Honeywell equipment on Customer's premises is destroyed or substantially damaged. Likewise, Customer may terminate this Support Services Agreement in the event Customer's premises are destroyed. In the event of such termination under this Section A.7.3, neither party shall be liable for damages or subject to any penalty, except that Customer will remain liable for Support Services performed to the date of termination.

A.8 Appropriations and Essential Use

A.8.1 Customer reasonably believes that sufficient funds can be obtained to make all payments for the initial term, as described in the summary at the beginning of this Support Services Agreement. Customer hereby covenants that it shall do all things lawfully within its power to obtain funds from which such payments may be made, including making provisions for such payments, to the extent necessary, in each budget submitted for the purpose of obtaining funding, using its bona fide best efforts to have such portion of the budget approved and exhausting all available administrative reviews and appeals in the event such portion of the budget is not approved. It is Customer's intent to make the payments for the initial term if funds are legally available therefore and in that regard Customer represents that (a) the use of the Covered Equipment and Support Services is essential to its proper, efficient and economic functioning or to the services that is provided to its citizens; (b) Customer has an immediate need for and expects to make immediate use of substantially all the Covered Equipment and Support Services, which need is not temporary or expected to diminish in the foreseeable future; and (c) the Covered Equipment and Support Services shall be used by Customer only for the purpose of performing one or more of its governmental or proprietary functions consistent with the permissible scope of its authority.

A.8.2 In the event no funds or insufficient funds are appropriated and budgeted for the acquisition, retention or operation of the Covered Equipment and Support Services under the Support Services Agreement, then Customer shall, not less than sixty (60) days prior to the end of such applicable fiscal period, in writing, notify Honeywell (and its assignee, if any) of such occurrence. The Support Services Agreement shall thereafter terminate and be rendered null and void on the last day of the fiscal period for which appropriations were made without penalty, liability or expense to Customer of any kind, except as to (i) the portions of the payments herein agreed upon for which funds have been appropriated and budgeted or are otherwise available, and (ii) Customer's other obligations and liabilities under the Agreement relating to, accruing or arising prior to such termination. In the event of such termination, Customer agrees to peaceably surrender to Honeywell (or its assignee, if any) possession of any equipment that is provided by Honeywell under the Support Services Agreement, on the date of such termination, packed for shipment in accordance with manufacturer's specifications and eligible for manufacturer's maintenance, and freight prepaid and insured to any location in the continental United States designated by Honeywell, all at Customer's expense. Honeywell (or its assignee, if any) may exercise all available legal and equitable rights and remedies in retaking possession of any equipment provided by Honeywell under this Support Services Agreement.

A.8.3 Notwithstanding the foregoing, Customer agrees (a) that if the Support Services Agreement is terminated in accordance with the preceding paragraph, Customer shall not purchase, lease or rent equipment which performs the same functions as, or functions taking the place of, those performed by the Covered Equipment nor shall it contract for any services similar to or that take the place of the Support Services provided under the Support Services Agreement, and shall not permit such functions to be performed by its own employees or by any agency or entity affiliated with or hired by Customer for the balance of the fiscal period in which such termination occurs or the next succeeding fiscal period thereafter, and (b) that it shall not, during the initial term, give priority in the application of funds to any other functionally similar equipment or services.

The following terms and conditions, in Sections A.9 to A.12, apply to all Support Services, except for the M&V Services.

A.9 Warranty

Any equipment provided as part of the Support Services shall be covered by the warranties set forth in Section 2.4 of the Main Agreement. The warranty term for such equipment shall commence upon installation.

A.10 Refrigerant

A.10.1 Customer is responsible for the containment of any and all refrigerant stored on or about the premises. Customer accepts all responsibility for and agrees to indemnify and hold harmless Honeywell from and against any and all claims, damages, or causes of action that arise out of the storage, consumption, loss and/or disposal of refrigerant, except to the extent Honeywell has brought refrigerant onsite and is directly and solely negligent for its mishandling.

A.11 Coverage of Support Services (other than M&V Services)

A.11.1 It is understood that the repair, replacement, and emergency service provisions of this Support Services Agreement, if any, apply only to the Covered Equipment. "Covered Equipment" means the equipment covered by the Support Services other than M&V Services, if any, to be performed by Honeywell under this Support Services Agreement, and is limited to the equipment expressly identified as such in the Scope of Support Services.

A.11.2 Customer agrees to use Covered Equipment and software covered by the Support Services in accordance with the manufacturer's specifications.

A.11.3 Honeywell may install diagnostic devices and/or software at Honeywell's expense to enhance system operation and support. Upon termination or expiration of this Support Services Agreement, Honeywell may remove these devices and return the applicable system(s) to their original operation. Customer agrees to provide, at its sole expense, connection to the switched telephone network for the diagnostic devices and/or software.

A.11.4 This Support Services Agreement assumes that the applicable systems and/or Covered Equipment and applicable software are in maintainable condition. If repairs are necessary upon initial inspection or initial seasonal start-up, repair charges will be submitted for approval. Should these charges be declined, those non-maintainable items will be eliminated from coverage under this Support Services Agreement and the Support Services Price adjusted accordingly.

A.11.5 In the event that any applicable system or any equipment component thereof is altered, modified, changed or moved, this Support Services Agreement may be immediately adjusted or terminated, at Honeywell's sole option. Honeywell is not responsible for any damages resulting from such alterations, modifications, changes or movement.

A.11.6 Maintenance, repairs, and replacement of equipment parts and components are limited to restoring to proper working condition.

A.11.7 Customer will promptly notify Honeywell of any malfunction in the system(s) or Covered Equipment that comes to Customer's attention**.**

A.12 Automatic Renewal

A.12.1 After the initial Support Services Term, and only with respect to Support Services other than M&V Services, this Support Services Agreement will automatically renew for consecutive terms of one (1) year each ("Auto-Renewal") unless terminated by either party by the delivery of written notice to the other at least sixty (60) days prior

to the end of the Support Services Term or any renewal period thereof or unless terminated as otherwise provided herein.

A.13 Honeywell SAAS Terms

A.13.1 Notwithstanding anything else to the contrary in this Agreement, the following Honeywell SAAS Terms apply solely to the Honeywell Forge Predictive Maintenance services ("SaaS", "Offering", or "SaaS Offering") described in Section B.2 of this Attachment D:

A.13.1.1 Agreement. The software-as-a-service offering for which you have contracted and have purchased Use Rights ("SaaS") is identified in Section B.2 of this Attachment D.

A.13.1.2 Parties. "Honeywell", "we", "us" or "our" means Honeywell International Inc. or Affiliate(s) who execute or assent to this Agreement. "You" or "your" means collectively the other entity(ies) executing or assenting to this Agreement. "Affiliate" means any entity that controls, is controlled by, or is under common control with, another entity. An entity "controls" another if it owns directly or indirectly a sufficient voting interest to elect a majority of the directors or managing authority or otherwise direct the affairs or management of the entity.

A.13.1.3 Use Rights. Subject to payment of agreed fees and strict compliance with the terms of access and acceptable use we will provide you solely for your internal business purposes: (a) remote access to the SaaS through means we provide (which may include online portals or interfaces such as https, VPN or API); and (b) a limited, revocable, non-exclusive, non-assignable, non-transferable license to: (i) download, install, update or allow us to update (when applicable), and use software we provide solely in support of your usage of the SaaS; and (ii) use SaaS documentation as reasonably required in connection with the SaaS (collectively, "Use Rights"). Use Rights continue for the duration of the period stated in Attachment D. This Attachment D may list metrics, including user number, data volume, sensors or other means to measure usage or fees ("Usage Metrics"). Use Rights are subject to Usage Metrics and restrictions in the Agreement. If you exceed Usage Metrics, we may suspend access until you pay required fees. You, your employees and any party accessing the SaaS on your behalf ("Users") may exercise Use Rights, provided that, you must bind them to the Agreement and are responsible for their compliance with it, any breach by them and their acts and omissions. You may not resell Use Rights or permit third parties (except Affiliates or service providers) to be Users or make copies of the SaaS (except for back up) except as agreed by us in writing. We have no responsibility with respect to actions or inactions of Users.

A.13.1.4 Accounts. You may be required to download a mobile app, or visit an internet portal or site, through which you access the SaaS and set up accounts including issuance or authentication credentials. In operating your account you and Users must: (i) maintain strict confidentiality of user names, passwords or other credentials; (ii) assign accounts to unique individuals and not allow others to use your credentials or access your account, including sharing among multiple Users; (iii) immediately notify us of any unauthorized use or breach of security related to your account; (iv) submit only complete and accurate information; (v) maintain and promptly update information if it changes; and (vi) manage User access. We may use rights management features (e.g., lockout) to prevent unauthorized use.

A.13.1.5 Acceptable Use. The Use Rights are the only acceptable use of the SaaS. You will not, and will not permit any person or entity to, use the SaaS for purposes of, or in connection with: (a) reverse engineering, making machine code human readable or creating derivative works or improvements; (b) interfering with its security or operation (including probing, scanning or testing the vulnerability of security measures or misrepresenting transmission sources); (c) creating, benchmarking or gathering intelligence for a competitive offering; (d); infringing another's IPR; (e) employing it in hazardous environments requiring fail-safe performance where failure could lead directly or indirectly to personal injury or death or property or environmental damage; (f) employing it as a substitute for a third-party monitored emergency notification system; (g) use that would reasonably be expected to cause liability or harm to us or our customers or breach the Agreement; and/or (h) critical control of your environment, emergency situations, life safety or critical purposes. Violation of the restrictions in this Section is a breach of Use Rights.

A.13.1.6 Set Up, Support. Initial set up and configuration are provided if stated in this Attachment D. We will manage, maintain and support the SaaS ("Support") in accordance with the policies specified in this Agreement or, if none are specified, we will use commercially reasonable efforts to maintain the SaaS, repair reproducible defects and make available as a whole 99% of the time 24x7x365 subject to scheduled downtime, routine and emergency maintenance and force majeure. Except as otherwise expressly set forth in this Agreement, you are responsible the connectivity required to use the SaaS and for maintaining the equipment and infrastructure that connects to the SaaS. Set up and Support excludes device or Third-Party Application set up unless stated in this Agreement. We are not responsible or liable for issues, problems, unavailability, delay or security incidents arising from or related to: (i)

conditions or events reasonably outside of our control; (ii) cyberattack; (iii) the public internet and communications networks; (iv) data, software, hardware, services, telecommunications, infrastructure or networking equipment not provided by us or acts or omissions of third parties you retain; (v) your and Users negligence or failure to use the latest version or follow published documentation; (vi) modifications or alterations not made by us; (vii) loss or corruption of data; (viii) unauthorized access via your credentials; or (ix) your failure to use commercially reasonable administrative, physical and technical safeguards to protect your systems or data or follow industry-standard security practices. We reserve the right to modify the SaaS at any time without degrading its core functionality. We may monitor usage.

A.13.1.7 Term, Termination. The Agreement commences on the effective date of, and continues for the duration in, this Agreement in addition to any Auto-Renewal term, unless terminated earlier in accordance with its terms ("Term"). The provisions of A.12.1 of this Agreement shall apply and are hereby incorporated by reference. Except for material breach or if stated in this Agreement, you may not terminate your use of the SaaS for convenience during the subscription period set out in the Agreement or during an Auto-Renewal term. We may terminate immediately upon written notice if the SaaS is provided at no charge, your use is fraudulent, continued use would subject us to third party liability or we cease making the SaaS generally available to third parties. We may suspend Use Rights if we determine that you or Users are or may violate the Agreement (including a failure to pay fees by the due date) or pose a security threat. The non-breaching party may terminate if the other party materially breaches and fails to cure within 30 days of written notice. During suspension, you and Users will not have access to all or part of the SaaS and may be unable to access Input Data. Upon termination or expiry your Use Rights will expire, you will no longer have access to your Input Data, and you must delete all copies of SaaS and credentials. Section A.13.1.5 to A.13.1.19 and those portions of this Attachment D and the Agreement that by their nature should survive, survive termination or expiration.

A.13.1.8 Data. You retain all ownership or other rights over data that you or persons acting on your behalf input, upload, transfer or make available in relation to, or which is collected from your devices or equipment by, the SaaS ("Input Data"). We and our Affiliates have the right to duplicate, analyze, transfer, modify and otherwise use Input Data to provide, improve or develop our offerings. You have sole responsibility for obtaining all consents and permissions (including providing notices to Users or third parties) and satisfying all requirements necessary to permit our use of Input Data. You will, at your cost and expense, defend, indemnify and hold harmless us and our Affiliates, sub-contractors and licensors from and against all losses, awards and damages (including attorneys' fees), arising out of claims by third parties related to our possession, processing or use of Input Data in accordance with the Agreement or you or Users' infringement, misappropriation or violation of our or a third party's IPR (except if caused by your authorized use of the SaaS). Unless agreed in writing, we do not archive Input Data for your future use. Your Input Data may be transferred outside of its country of origin. You consent to such any transfers of your Input Data outside of its country of origin, except that Personal Data is subject to the Data Processing Terms.

A.13.1.9 IP. All right, title and interest, including all intellectual property rights (including copyrights, trademarks and patents), proprietary rights (including trade secrets and know-how), and moral rights (including rights of authorship and modification) throughout the world ("IPR") in and to the SaaS and all of its derivative works, modifications and improvements, are retained by Honeywell or its licensors and are our confidential information. We own all IPR that is: (i) developed by us or our Affiliates by processing or analysis of Input Data (excluding Input Data itself, but including derived data that is sufficiently different from Input Data so that Input Data cannot be identified from analysis or further processing of such derived data); or (ii) generated through support, monitoring or other observation of your and your Users' use of the SaaS. The operation and performance of the SaaS is our confidential information. If you provide any suggestions, comments or feedback regarding the SaaS, you hereby assign to us all right, title and interest in and to the same without restriction. You and Users shall not remove, modify or obscure any IPR notices on the SaaS.

A.13.1.10 IP Indemnification. We will at our cost and expense, defend any third-party claim, suit or proceeding against you and your Affiliates and sub-contractors, solely to the extent arising out of claims by third parties that your use of the Offering (as provided by us) in accordance with the Agreement, infringed, violated or misappropriated their copyright, patent or trademark ("Third-Party IP Claim"), and we will pay the (i) damages, and (ii) reasonable and verifiable third-party out-of-pocket costs and expenses (including reasonable attorney's fees), which are finally awarded against you by final judgment of a court of competent jurisdiction (or pursuant to a settlement agreed to in writing by us), directly attributable to such Third-Party IP Claim. We have no indemnification obligations to the extent a claim arises from: (a) data you provide; (b) your use of the outputs of the Offering or unauthorized use; (c) combining the Offering with goods, technology or services not supplied by us; (d) modifications by anyone other than us; or (e) compromise or settlement made by you without our written consent. If the Offering is held to infringe, or we believe it may be infringing, we may undertake at least one of the following with respect to the allegedly infringing materials at our option: (i) procure a license to allow your use; (ii) modify the Offering to make

it non-infringing; or (iii) procure a license to a reasonable substitute product. If we cannot do one of these within a reasonable period of time, we may terminate the Agreement by notice and refund a pro-rata portion of pre-paid fees received during the applicable period without any further liability. This Section sets out your sole and exclusive remedy in case of a Third-Party IP Claim. Our obligations under this Section are contingent upon you notifying us in writing of a Third-Party IP Claim promptly upon becoming aware thereof. We have the sole right to control the defense and/or settlement of each Third-Party Claim and you will provide reasonable assistance.

A.13.1.11 Security. Security is governed by the policies in this Agreement or if none are specified: (i) we will use commercially reasonable administrative, physical and technical safeguards to protect personal data and Input Data and follow industry-standard security practices, as set out in the Security Practices at https://hwll.co/securitypractices; and (ii) following a confirmed breach of security leading to the accidental or unlawful destruction, loss, alteration or unauthorized access, disclosure or use of your Personal Data or Input Data we will notify you without undue delay and as relevant information becomes available to assist you in meeting your potential reporting or notice obligations under applicable law and you will work with us in good faith to develop related public statements or required notices. You are solely responsible for costs and liability incurred due to unauthorized use or access through your or Users' account credentials or systems and for security of on-premises software and hardware.

A.13.1.12 Third-Party Applications. The SaaS may contain features designed to interoperate with applications, software, or platforms provided by you or a third party ("Third-Party Applications"). Your use of a Third-Party Application is subject to a separate agreement between you and the relevant third party. You grant us all rights necessary to host, copy, use, transmit, or display Third-Party Application to facilitate interoperation with the SaaS. Honeywell does not warrant or support Third-Party Applications and cannot guarantee their continued security, availability or performance. Your use of a Third- Party Application may enable the transfer of Input Data or Personal Data outside of the SaaS and you are solely responsible for any liability or loss relating to such transfer.

A.13.1.13 Licenses. The Offering may include open-source software ("OSS") and to the extent required by licenses covering OSS, such licenses may apply to OSS in lieu of this Agreement. If an OSS license requires us to make an offer to provide source code or related information in connection with that OSS, such offer is hereby made. If required by our written contract with them, certain of our licensors are third-party beneficiaries of the Agreement.

A.13.1.14 Confidentiality. All non-public, confidential or proprietary information disclosed by a party to the other party in performance of this Agreement ("Confidential Information") will be protected using the same degree of care, but no less than reasonable care, as the recipient uses to protect its own Confidential Information and will not, without the written consent of the disclosing party, be used or disclosed except for the purpose of, or as permitted by, this Agreement and only by the receiving party's affiliates, employees and service providers who are bound to substantially similar obligations of confidentiality and have a need to know. Each Party will be responsible for breaches of the confidentiality obligations by its affiliates, employees or service providers. Receiving party will keep Confidential Information confidential for 5 years from disclosure. Except as set out in this Agreement, information will not be Confidential Information unless (a) marked "CONFIDENTIAL" or similar at disclosure; (b) disclosed orally or visually but identified as confidential at disclosure and designated as confidential in writing in 30 days of disclosure summarizing the Confidential Information sufficiently for identification, or (c) it should reasonably be understood to be confidential given the nature of the information as sensitive and non-public. Confidential Information excludes information that: (d) was already known to recipient without restriction; (e) is publicly available through no fault of recipient; (f) is rightfully received by recipient from a third party without a duty of confidentiality; or (g) is independently developed. A party may disclose Confidential Information when compelled to do so by law if it provides prior notice to the other party and reasonable opportunity to contest or limit disclosure, unless a court orders that the other party not be given notice. The Agreement and the internal operation and performance of the SaaS are our Confidential Information.

A.13.1.15 Privacy. We may process certain data and information about you, users, and/or your or their employees, customers, contractors, or Affiliates that are recognized under applicable law as "personal data" or equivalent terms ("Personal Data") in connection with the Agreement. If we process Personal Data on your behalf, our Data Processing Terms, available at https://hwll.co/dataprocessingterms , apply. We collect and use such Personal Data in accordance with our Privacy Statement, available at https://www.honeywell.com/us/en/privacy-statement. Each Party will comply with applicable privacy and data protection laws.

A.13.1.16 Warranty Disclaimer. EXCEPT AS EXPRESSLY SET FORTH IN THE AGREEMENT THE SAAS AND SUPPORT ARE PROVIDED 'AS IS' WITH NO WARRANTIES OR REPRESENTATIONS OF ANY KIND, WHETHER EXPRESS, IMPLIED OR STATUTORY. WE ARE NOT RESPONSIBLE OR LIABLE FOR

YOUR (OR YOUR USERS) USE OF THE SAAS OR INTERPRETATION OF OR ACCURACY OF ITS OUTPUT. TO THE MAXIMUM EXTENT PERMITTED BY LAW, WE EXPRESSLY DISCLAIM ALL CONDITIONS, WARRANTIES AND REPRESENTATIONS INCLUDING NON-INFRINGEMENT, MERCHANTABILITY, SATISFACTORY QUALITY AND FITNESS FOR PURPOSE. NOTHWITHSTANDING THE FOREGOING, WE DO NOT WARRANT THAT THE SAAS WILL MEET YOUR REQUIREMENTS, OR THAT IT WILL OPERATE WITHOUT INTERRUPTION, OR BE ERROR FREE.

A.13.1.17 Limitation. EXCEPT FOR BREACH OF SECTION **A.13.1.**3 (USE RIGHTS), **A.13.1.**5 (ACCEPTABLE USE) OR **A.13.1.1**9 (IP) OR FEES PAYABLE, NEITHER PARTY WILL IN RELATION TO THESE SAAS TERMS BE LIABLE FOR (a) LOST PROFITS, REVENUES, GOODWILL, OPPORTUNITY OR ANTICIPATED SAVINGS; OR (b) INDIRECT, INCIDENTAL, EXEMPLARY, PUNITIVE, SPECIAL OR CONSEQUENTIAL DAMAGES. EXCEPT IF STATED IN THE AGREEMENT, FOR FEES PAYABLE OR EXCLUSIONS, EACH PARTY'S CUMULATIVE AND AGGREGATE LIABILITY WILL IN RELATION TO THESE SAAS TERMS BE LIMITED TO DIRECT DAMAGES IN AN AMOUNT EQUAL TO THE GREATER OF: (a) TOTAL AMOUNTS PAID FOR THE SAAS DURING THE 6 MONTHS IMMEDIATELY PRECEDEING THE FIRST EVENT GIVING RISE TO THE CLAIM OR (b) U.S. $50,000. ALL CLAIMS THAT A PARTY MAY HAVE WILL BE AGGREGATED AND MULTIPLE CLAIMS WILL NOT ENLARGE THE FOREGOING LIMIT. OUR LIABILITY UNDER EVALUATION OR TRIAL RIGHTS IS LIMITED TO U.S. $1,000. "Exclusions" are: (i) claims resulting from either party's fraud or willful misconduct; (ii) a party's breach of confidentiality obligations (except in relation to Input Data and Personal Data for which the cap applies) or Sections **A.13.1.**3 (Use Rights), **A.13.1.**5 (Acceptable Use) or **A.13.1.**9 (IP); (iii) a party's indemnity obligations under Section 7 (Privacy) and Section **A.13.1.**10 (IP Indemnification); and (iv) claims against us or our Affiliates relating to possession, processing or use of Input Data or Personal Data in accordance with this Agreement. All claims and causes of action must be brought within six months of being discovered. Nothing stops a party from seeking declaratory, injunctive or other equitable relief from a court of competent jurisdiction or excludes or limits a Party's liability to the other for any matter that cannot lawfully be excluded or limited. LIMITATIONS AND EXCLUSIONS APPLY TO ALL CLAIMS AND CAUSES OF ACTION ARISING OUT OF OR IN RELATION TO THE AGREEMENT REGARDLESS OF FORM.

A.13.1.18 Compliance. You must comply with all laws and regulations applicable to your use of Offering including data privacy, localization, and anti-bribery. Your rights to use the Offering is subject to such compliance. For purposes of FARs, DFARs and access by governmental authorities, the Offering is "commercial computer software", "commercial computer software documentation" and "restricted data" provided to you under "Limited Rights" and "Restricted Rights" and only as commercial end items. You represent use of the Offering will comply with all sanctions laws administered by OFAC, other U.S. regulatory agencies, the European Union and its Member States, the United Kingdom, and the United Nations ("Sanctions Laws"). You represent that you, your Affiliates or Users are not: (i) named on a governmental denied party or restricted list, including but not limited to: the Office of Foreign Assets Control ("OFAC") list of Specially Designated Nationals and Blocked Persons ("SDN List"), the OFAC Sectoral Sanctions Identifications List ("SSI List"), and the sanctions list under other Sanctions Laws; (ii) organized under, ordinarily resident in, or physically located in a jurisdiction subject to comprehensive sanctions administered by OFAC, (including, Cuba, Iran, North Korea, Syria, and the Crimea region); or (iii) owned or controlled, directly or indirectly, 50% or more in the aggregate, by one or more individuals described in (i) or (ii) (collectively, "Sanctioned Persons"). You will not permit Sanctioned Persons to use, to access, or benefit from the Offering, and you will not export, re-export, or otherwise transfer the Offering for any purpose prohibited by Sanctions Laws. You will not submit to the Offering any data subject to the U.S. International Traffic in Arms Regulations or other Sanctions Laws. Your violation of this Section will be a material breach. You agree to notify us immediately, in writing, of actual or reasonably suspected violations. We may limit, suspend, or terminate the Offering or take other actions reasonably necessary to comply with applicable law without liability. You agree to indemnify us if we become subject to liability as a result of your non-compliance with applicable law.

A.13.1.19 Miscellaneous. Fees are invoiced in advance with invoices payable within 30 days of invoice date unless set out in this Agreement. Upon Auto-Renewal fees are paid in accordance with the relevant list price (plus applicable taxes) then in effect. Fees paid are non-cancellable and nonrefundable. Payments are in USD (unless agreed by us in writing) and must be made in accordance with the "Remit To" field on each invoice. We may, from time to time and in our sole discretion, issue surcharges to recover Honeywell's increased costs arising from or related to, without limitation: (a) foreign currency exchange variation; (b) increased cost of third-party content, freight labor materials or component costs; (c) impact of duties, tariffs, and other government actions; and (d) increased costs due to inflation (collectively, "Economic Surcharges"). If a dispute arises with respect to Economic Surcharges, and that dispute remains open for more than fifteen (15) days, we may, in our sole discretion, withhold performance and future shipments or combine any other rights and remedies as may be provided under the Agreement or permitted by law

until the dispute is resolved. The terms of this Section prevail in the event of inconsistency with any other terms in the Agreement. Any Economic Surcharges, as well as the timing, effectiveness, and method of determination thereof, will be separate from and in addition to any changes to pricing that are affected by any other provisions in the Agreement. Descriptions of future product direction or intended updates (including new or improved features or functions) other than the features and functions deployed as of date of this Agreement are intended for information purposes only and are not binding commitments on us to deliver any material, code or functionality. The development, release and timing of any such updates is at our sole discretion unless agreed otherwise in writing. We reserve the right to charge additional fees for new or improved features or functions. During the term and 24 months after, we or our designee can, during normal business hours upon reasonable notice, access, inspect and audit, your compliance with the Agreement and you will give access to information and personnel as we may reasonably request. Notwithstanding any other terms or provisions to the contrary, these Honeywell SaaS Terms solely apply and control with regard to Honeywell SaaS Offerings. Conflicts among the Agreement will be resolved by giving precedence to these SaaS Terms with regard to the Honeywell Forge Predictive Maintenance Services. Customer purchase orders are identified only to authorize payment and terms or conditions in any customer purchase order are not a part of the Agreement or controlling. You must comply with all laws and regulations applicable to your use of the SaaS including data privacy or localization, anti-bribery and export control laws (i.e., export to embargoed, prohibited or restricted countries or access by prohibited, denied or designated persons) and your rights to use the SaaS is subject to such compliance.

PART B. SUPPORT SERVICES SCOPE DESCRIPTION

B.1 Guarantee Analysis Services

B.1.1 Scope – Honeywell will implement the guarantee analysis services outlined in Section B.1.3 (the **"M&V Services"**) for the following ECMs. The M&V Services are to be performed consistent with the terms of the guarantee set forth in Part C, and the Schedule of Guaranteed Savings and related provisions set forth in Part D, in each case of this Attachment D. Certain defined terms are set forth in Part C.

List of Covered Facilities, Meters, Energy Conservation Measures ("ECMs) by Service Offering:

(a)	(b)	(c)	(d)
Facility	**LDC-Meter # / Utility Type**	**ECMs** (list only ECMs associated with meter listed in Column (b))	**Related M&V Services Subsection**
Roosevelt High School	Electric: PGEG Acct #: 1593627000 Meter#: 80345965 - 0	ECM 1 – LED Lighting and Lighting Controls Upgrade ECM 5 – Install De-Stratification Fans ECM 6 – Building Management System Upgrades ECM 7 – Building Envelope Improvements ECM 9 – Install Walk-In Freezer/Coolers Controllers ECM 10 – Install Solar PV System	1.4.1
Roosevelt High School	Electric: PGEG Acct #: 1593677201 Meter#: 80351580 - 0	ECM 1 – LED Lighting and Lighting Controls Upgrade	1.4.1
Roosevelt High School	Natural Gas – National Grid Acct #: 9134266004 Meter #: 5768146	ECM 1 – LED Lighting and Lighting Controls Upgrade ECM 2 – Boiler Plant Upgrades ECM 3 – DHW Heater Upgrades ECM 5 – Install De-Stratification Fans ECM 6 – Building Management System Upgrades ECM 7 – Building Envelope Improvements ECM 8 – Pipe Insulation	1.4.5
Roosevelt Middle School	Electric: PGEG Acct #: 1593601821 Meter#: 80340663 - 0	ECM 1 – LED Lighting and Lighting Controls Upgrade ECM 4 – Mechanical Upgrades ECM 5 – Install De-Stratification Fans ECM 6 – Building Management System Upgrades ECM 7 – Building Envelope Improvements ECM 9 – Install Walk-In Freezer/Coolers Controllers ECM 10 – Install Solar PV System	1.4.1
Roosevelt Middle School	Natural Gas – National Grid Acct #: 5396235005 Meter #: 5101469	ECM 1 – LED Lighting and Lighting Controls Upgrade ECM 2 – Boiler Plant Upgrades ECM 5 – Install De-Stratification Fans ECM 6 – Building Management System Upgrades ECM 7 – Building Envelope Improvements ECM 8 – Pipe Insulation	1.4.5

(a)	(b)	(c)	(d)
Facility	**LDC-Meter # / Utility Type**	**ECMs** (list only ECMs associated with meter listed in Column (b))	**Related M&V Services Subsection**
Centennial Ave Elementary School	Electric: PGEG Acct #: 1591404651 Meter#: 80346441 - 0	ECM 1 – LED Lighting and Lighting Controls Upgrade ECM 4 – Mechanical Upgrades ECM 5 – Install De-Stratification Fans ECM 6 – Building Management System Upgrades ECM 7 – Building Envelope Improvements ECM 9 – Install Walk-In Freezer/Coolers Controllers ECM 10 – Install Solar PV System	1.4.1
Centennial Ave Elementary School	Natural Gas – National Grid Acct #: 4330629004 Meter #: 5863506	ECM 1 – LED Lighting and Lighting Controls Upgrade ECM 5 – Install De-Stratification Fans ECM 6 – Building Management System Upgrades ECM 7 – Building Envelope Improvements ECM 8 – Pipe Insulation	1.4.5
Ulysses Byas Elementary School	Electric: PGEG Acct #: 1592401921 Meter#: 80345966 - 0	ECM 1 – LED Lighting and Lighting Controls Upgrade ECM 4 – Mechanical Upgrades ECM 5 – Install De-Stratification Fans ECM 6 – Building Management System Upgrades ECM 7 – Building Envelope Improvements ECM 9 – Install Walk-In Freezer/Coolers Controllers ECM 10 – Install Solar PV System	1.4.1
Ulysses Byas Elementary School	Natural Gas – National Grid Acct #: 174815000 Meter #: 5153116	ECM 1 – LED Lighting and Lighting Controls Upgrade ECM 5 – Install De-Stratification Fans ECM 6 – Building Management System Upgrades ECM 7 – Building Envelope Improvements ECM 8 – Pipe Insulation	1.4.5
Washington-Rose Elementary School	Electric: PGEG Acct #: 1594137921 Meter#: 96793831 - 0	ECM 1 – LED Lighting and Lighting Controls Upgrade ECM 5 – Install De-Stratification Fans ECM 6 – Building Management System Upgrades ECM 7 – Building Envelope Improvements ECM 9 – Install Walk-In Freezer/Coolers Controllers ECM 10 – Install Solar PV System	1.4.1
Washington-Rose Elementary School	Natural Gas – National Grid Acct #: 5463965009 Meter #: 5768590	ECM 1 – LED Lighting and Lighting Controls Upgrade ECM 2 – Boiler Plant Upgrades ECM 5 – Install De-Stratification Fans ECM 6 – Building Management System Upgrades ECM 7 – Building Envelope Improvements ECM 8 – Pipe Insulation	1.4.5
Washington-Rose Elementary School	Natural Gas – National Grid Acct #: 4218566006 Meter #: 6027459	ECM 3 – DHW Heater Upgrades	1.4.5

B.1.1.1 General Descriptions – The following are general descriptions of one or more approaches to providing guarantee analysis services. The specific details of the M&V Services relating to the Retrofit as set forth in this Support Services Agreement take precedence over these descriptions.

Option A—Retrofit Isolation with Key Parameter Measurement
This option is based on a combination of measured and estimated factors when variations in factors are not expected. Measurements are spot or short-term and are taken at the component or system level, both in the baseline and post-installation cases. Measurements should include the key performance parameter(s) which define the energy use of the ECM. Estimated factors are supported by historical or manufacturer's data. Savings are determined by means of engineering calculations of baseline and post-installation energy use based on measured and estimated values. Savings are calculated using direct measurements and estimated values, engineering calculations and/or component or system models often developed through regression analysis. Adjustments to models are not typically required.

Option B—Retrofit Isolation with All Parameter Measurement
This option is based on periodic or continuous measurements of energy use taken at the component or system level when variations in factors are expected. Energy or proxies of energy use are measured continuously. Periodic spot or short-term measurements may suffice when variations in factors are not expected. Savings are determined from analysis of baseline and reporting period energy use or proxies of energy use. Savings are calculated using direct measurements, engineering calculations, and/or component or system models often developed through regression analysis. Adjustments to models may be required.

Option C – Utility Data Analysis
This option is based on long-term, continuous, whole-building utility meter, facility level, or sub-meter energy (or water) data. Savings are determined from analysis of baseline and reporting period energy data. Typically, regression analysis is conducted to correlate with and adjust energy use to independent variables such as weather, but simple comparisons may also be used. Savings calculations use regression analysis of utility meter data to account for factors that drive energy use. Adjustments to models are typically required.

Option D—Calibrated Computer Simulation
Computer simulation software is used to model energy performance of a whole-facility (or sub-facility). Models must be calibrated with actual hourly or monthly billing data from the facility. Implementation of simulation modeling requires engineering expertise. Inputs to the model include facility characteristics; performance specifications of new and existing equipment or systems; engineering estimates, spot-, short-term, or long-term measurements of system components; and long-term whole-building utility meter data. After the model has been calibrated, savings are determined by comparing a simulation of the baseline with either a simulation of the performance period or actual utility data. Savings calculations are done based on computer simulation model (such as eQUEST) calibrated with whole-building or end-use metered data or both. Adjustments to models are required.

B.1.2 Coverage – The M&V Services includes all labor, travel, and expenses to perform the services and frequency described in Section B.1.3. In general, and subject to details of the M&V Plan, Honeywell will provide a single (1) reporting submission of the determination of the amount of Cost Avoidance for each Guarantee Year. Services not explicitly described in Section B.1.3, including Customer Guarantee Responsibilities, are not included.

B.1.3 M&V Plan: In general, the M&V Services:

(a) are required to be performed for the entire Guarantee Term;
(b) may employ one or more of Options A, B, C or D; and
(c) include delivering a report on an annual basis, for either the entire Guarantee Term, or for a shorter M&V reporting term.

The details of the M&V Services are set forth in the M&V Plan, as described in detail in Exhibit D-7, which takes precedence over the general description in this Section B.1.3.

B.1.4 M&V Offerings – In coordination with Section B.1.1, HONEYWELL will perform the Measurement & Verification (M&V) offerings checked below:

☒ **B.1.4.1 Retrofit Isolation Energy Audit for Option A/B Verified ECMs –** HONEYWELL will provide *Option A* energy guarantee auditing services as detailed in Attachment D, and Exhibits to Attachment D for specific Energy Conservation Measures (ECMs) identified in Attachment D and/or Exhibits to Attachment D as using *Option A* methodologies for Measurement and Verification. HONEYWELL will provide this one-time determination of the quantity of energy avoidance of the CUSTOMER'S facility for the First Guarantee Year only. Option A methods will be applied on an ECM specific basis (i.e., isolated to the retrofit) and Energy Cost Avoidance for a Guarantee Year will be quantified and summarized on an ECM basis. After the ECM's potential-to-save has been verified (Section B.1.3) HONEYWELL shall either stipulate the quantity of cost avoidance or determine the cost avoidance from engineering calculations and measurement of specific variables as described in Section D.1.1.1. Utility bill auditing (Option C) and reconciliation of Option A results to utility meter bill data is not included. The Option A/B retrofit isolation method was selected by the CUSTOMER to provide an economical reconciliation method and to minimize the interactive effects on the determination of cost avoidance due to changes to the site or facilities from the baseline conditions.

HONEYWELL will provide a single (1) reporting submission of the determination of energy avoidance for the First Guarantee Year. The Energy Avoidance quantified in the First Guarantee Year will be stipulated as the annual Energy Avoidance for each Guarantee Year of the remaining contract term. Reporting of Cost Avoidance will occur each year of the term and the monetization of Cost Avoidance will be determined as described in Section D.1.1.1.

Work Coverage: Utility Meters listed in Section B.1.1 designated as Option A

Term Coverage: Year 1 Monitoring; Year 2 to End of Term stipulated based on Year 1 Results

Option A/B Audit Report section will be submitted: ☐ 1-Time Only ☐ Quarterly ☐ Semi-Annually ☒ Annually

B.1.4.2. - Reserved
B.1.4.3. - Reserved
B.1.4.4. - Reserved

☒ **B.1.4.5 Utility Bill Energy Audit for Option C verified ECMs –** HONEYWELL will provide *Option C* energy guarantee auditing services as detailed in Attachment D and Exhibits to Attachment D for specific Energy Conservation Measures (ECMs) identified in Attachment D and/or Exhibits to Attachment D as using *Option C* methodologies for Measurement and Verification to quantify the derived Energy Cost Avoidance of the CUSTOMER's facility. Under *Option C* services, HONEYWELL will analyze CUSTOMER'S energy use and costs against an "established baseline" described in Attachment D and Exhibits to Attachment D. HONEYWELL will use energy auditing software to track monthly facility costs, energy consumption, and Energy Cost Avoidance and to quantify and report on changes in energy usage due to changes in billing periods and weather. HONEYWELL will adjust the baseline for changes in energy usage due to changes in variables including, but not limited to billing periods, weather, production, occupancy, building load, conditioned building area, equipment operation, and scheduling methodologies etc. as defined in Attachment D and Exhibits to Attachment D. These routine and non-routine baseline adjustments will be calculated using industry-standard engineering calculations. Reporting of Cost Avoidance will occur each year of the term and the monetization of Cost Avoidance will be determined as described in Section D.1.1.1.

Work Coverage: Fuel Savings Only for All Applicable ECMs

Term Coverage: Year 1 to End of Term

Option C Audit Report section will be submitted: ☐ 1-Time Only ☐ Quarterly ☐ Semi-Annually ☒ Annually

B.2. Honeywell Forge Predictive Maintenance

Honeywell will provide the following services enabled by Honeywell Forge Predictive Maintenance to Customer with respect to the mechanical equipment connected to the Niagara Tridium system identified in Attachment A under ECM 6 (Building Management System Upgrades) for all five (5) school buildings. As used herein, "Agreement" means the agreement between Honeywell and Customer of which this Work Scope Document is a part, as amended and together with all exhibits, schedules and attachments incorporated into such agreement.

The scope identified in Attachment A under ECM 6 will cover the effort to retrieve the technical details of the local HVAC distribution system and the creation of the digital twin model in the Honeywell cloud needed to run Honeywell Forge Predictive Maintenance. This scope includes control systems and methodology validation, internet and data connectivity to the cloud, BMS point history changes, and software patching, updates and installation. Customer will fully cooperate with Honeywell to enable and accommodate this scope including, without limitation, giving Honeywell and its subcontractors (if any) such access to Customer's facilities and systems as Honeywell may reasonably request.

To support monitoring and diagnostics, Honeywell may install additional software on Customer's applicable building automation system(s) (the "BMS System"). Such software will remain the property of Honeywell or its nominated software licensor and shall be removed from the BMS System and returned to Honeywell at Honeywell's request. Honeywell Forge Predictive Maintenance is designed to identify certain faults or anomalies in the Customer's mechanical equipment. Once such faults or anomalies are identified, these are converted to service work orders and are dispatched to service technicians for further investigation of the root causes of the identified fault or anomaly. Such service work orders represent "Service Cases". Customer and Honeywell will agree upon Honeywell's performance of such work and Customer will pay Honeywell an extra fee at Honeywell's hourly rates set forth in the Agreement (or if no such rates are set forth, at Honeywell's standard hourly rates) for such work plus the cost of any materials, subject to Honeywell's then-prevailing markup. Honeywell shall have no obligation to address or respond to emergencies except to the extent expressly provided in the Agreement.

Honeywell will establish a connection from the BMS System to Honeywell's cloud and its related HVAC and energy analytics tools. These tools are intended to identify certain faults or anomalies in the operation of Customer's mechanical equipment. Faults or anomalies may be raised as Service Cases as noted above.

Honeywell will make available on the Honeywell Forge Portal summary key performance indicators ("KPI") for the five (5) school buildings identified in Attachment A under ECM 6 - as such KPIs are developed by Honeywell in its sole discretion. The KPIs are available in the following key categories:

- Comfort performance
- Energy performance (if and to the extent there are electricity meters connected)
- Maintenance performance

Honeywell will periodically provide a service report that describes the status of Service Cases initiated or received by Honeywell that are new, active or closed in that particular period. The reporting frequency may be monthly or such other periodic basis as determined by Honeywell, in its sole discretion.

Service Cases, whether raised as a result of analytics, scheduled maintenance activities or otherwise, may be addressed by Honeywell through the use of remote access software. This software is supplied by Honeywell and remains Honeywell's property. Upon Honeywell's request, Customer will enable such remote access for Honeywell through a secure Internet connection maintained by Customer and configured as requested by Honeywell.

Honeywell's Product Terms released from time to time form part of this Agreement. Honeywell may update these Product Terms from time to time. Honeywell will make commercially reasonable efforts to notify Customer in advance of the effective date of any material changes. Continued use of the SaaS Offering constitutes Customer's consent to such changes.

PART C. GUARANTEE TERMS

C.1. Definitions

When used in this Agreement, the following capitalized words shall have the meanings ascribed to them below:

"Annual Scheduled Savings" means for any applicable Guarantee Year, the amount set forth in the Schedule of Guaranteed Savings in Section D.1.

"Baseline" or **"Base Year"** is the description that defines the Baseline Usage unit costs and facilities, systems, or equipment operations and characteristics, and environmental conditions that are to be used as the benchmark for determining Cost Avoidance. It may not always be one contiguous element of time and may be different from a 365-day annual period.

"Baseline Period" is the period of time (specified in Part D) coordinated with the Baseline Usage, including for the purpose of utility bill analysis, to allow the comparison of a Guarantee Year against a Baseline. The Baseline Period may not always be one contiguous element of time and may be different from a 365-day annual period. Baseline information from non-contiguous elements of time may be normalized and assigned to a specified Baseline Period.

"Baseline," "Baseline Usage" or "Baseline Demand" is the calculated or measured Energy usage (demand) by a piece of equipment or a site prior to the implementation of the ECMs. Baseline physical conditions, such as equipment counts, nameplate data, and control strategies, will typically be determined through surveys, inspections, and/or metering at the site.

"Construction Period" is the time period between the start of the project installation and the date of Final Project Acceptance.

"Cost Avoidance" means the difference between the actual cost incurred during a selected time period versus what the cost *would have been* had the ECM not been implemented, including without limitation avoided, defrayed, or reallocated costs.

"Customer Guarantee Practices" are those practices identified herein, intended to achieve Cost Avoidance or necessary to the analysis thereof, as set forth in Section C.4.

"Energy" means utilities and may include electricity and fuels to operate HVAC equipment, facility mechanical and lighting systems, and energy management systems, and water and sewer usage, and secondary utilities such as district steam or compressed air as applicable.

"Energy Costs" means the cost of Energy.

"ECM" means an energy conservation measure, which is the installation of equipment or systems, or modification of equipment or systems as described in Attachment A, for the purpose of avoiding utility (energy, water, etc.) consumption and demand and costs and/or non-utility (O&M, operational) costs.

"Excess Savings" means for any Guarantee Year, the amount, if any, by which the Cost Avoidance applicable to that Guarantee Year exceeds the Annual Scheduled Savings.

"Facilities" shall mean those buildings, or any other facility, location or infrastructure, where Savings will be realized.

"Financing Document" refers to that document, if any, executed between Customer and a third-party financing entity providing for payments from Customer to third-party financing entity.

"Final Project Acceptance" refers to date of Customer signature of the Final Project Acceptance Certificate (see Attachment J) indicating Customer acceptance of the installation of all of the ECMs.

"First Guarantee Year" is defined as the period beginning on the first (1st) day of the month following the date of Final Project Acceptance of the Work installed and ending on the day prior to the first (1st) anniversary thereof.

"Guarantee Period" is defined as the period beginning on the first (1st) day of the First Guarantee Year and ending on the last day of the final Guarantee Year, also known as the **"Measurement and Verification Phase", "Measurement and Verification Period", "Performance Period", or "Performance Phase"**.

"Guarantee Year" is defined as the First Guarantee Year and each of the successive twelve (12) month periods commencing on the anniversary of the commencement of the First Guarantee Year throughout the Guarantee Term.

"Guaranteed Savings" is defined as the total scheduled amount of Cost Avoidance that Honeywell is guaranteeing, as set forth in Section D.1 of Part D.

"Guarantee Term" shall have the meaning as defined in Section C.2.1 hereof, also referred to as "Term."

"M&V" means measurement and verification.

"M&V Systems and Equipment" as used in this Guarantee means the systems and equipment identified in Honeywell's Scope of Work and M&V Services, including as set forth in Section C.4.1.

"**Material Change**" is defined as any change in the following which reasonably could be expected to increase or decrease Energy or Operational Costs at a Facility by a value more than five percent (5%) of the Annual Scheduled Savings per utility meter or submeter, as applicable:

(1) manner of use of the Facility by Client;
(2) hours of operation of any equipment, building or energy system contained in the Facility;
(3) occupancy of the Facility;
(4) structure of the Facility;
(5) types of equipment used in the Facility; or
(6) conditions affecting energy use in the Facility.

"Measurement and Verification Plan" or "M&V Plan" is defined as the plan providing details on how the Guaranteed Savings will be verified.

"Operational Costs" commonly referred to as O&M costs, shall include the cost of operating and maintaining the Facilities, such as, but not limited to, the cost of inside and outside labor to repair and maintain affected systems and equipment, the cost of custodial supplies, the cost of replacement parts, the cost of deferred maintenance, the cost of lamp and ballast disposal, and the cost of new capital equipment.

"Potential-to-Save" or "Potential-to-Perform" by an ECM is satisfied when a measure is properly installed and has the potential to generate predicted levels of Cost Avoidance. Verification of an ECM's "potential-to-save" is satisfied upon Customer's signing of a Certificate of Substantial Completion, as set forth in Attachment J, or its equivalent.

"Retrofit" is the work provided by Honeywell as defined by the "ECMs."

"Retrofit Costs" are the sum of (i) the price for the Work; (ii) interest and other direct fees for financing required to be made by Customer pursuant to the Financing Document; and (iii) the payments required to be made by Customer for the M&V Services.

"Retrofit Isolation Method", **"RIM"**, **"RIM Approach"** or **"Retrofit Isolation Method Approach"** is an M&V approach that verifies the Guaranteed Savings using techniques that isolate the Energy use of the ECM and affected systems separate from the Energy use of the rest of the Facility. This method is used to mitigate the interactive Energy effects of changes made to the Facility outside of Honeywell's control.

"Savings" is another term for Cost Avoidance.

"Total Guarantee Year Savings" is defined as the summation of Cost Avoidance realized by Facilities in each Guarantee Year as a result of the Retrofit, and Support Services provided by Honeywell, as well as Excess Savings, if any, carried forward from previous years.

C.2. Term and Termination

C.2.1 Guarantee Term. The Guarantee Term shall commence on the first (1st) day of the month following the date of Final Project Acceptance of the Work installed pursuant to this Agreement, and shall terminate at the end of the Support Services Term (as defined at the beginning of this Attachment D), unless terminated earlier as provided for herein.

C.2.2 Guarantee Termination. Customer shall continue to contract with Honeywell for the M&V Services set forth in this Support Services Agreement for the entire Guarantee Term. Should this Support Services Agreement, or other existing agreements for the M&V Systems and Equipment not covered in this Support Services Agreement, be terminated in whole or in part for any reason, the Guarantee Term shall also terminate on the same date. The Guaranteed Savings for a Guarantee Year in which such termination becomes effective shall be prorated as of the effective date of such termination, with a reasonable adjustment for seasonal fluctuations in Energy Costs and Operational Costs, and the Guaranteed Savings for all subsequent Guarantee Years shall be null and void. M&V Services are conducted throughout the Guarantee Year and in the event Customer terminates during the year, Customer shall pay Honeywell the annual price for services prorated to the date of Honeywell's receipt of Customer's notice of termination.

C.3. Savings Guarantee

Guaranteed Savings Calculations Details

C.3.1 Guarantee of Savings. Honeywell guarantees to Customer that the identified Facilities will realize the total Guaranteed Savings through the combined value of all ECMs over the Guarantee Term, as defined herein.

C.3.1.1 Additional Savings Before Final Project Acceptance. All Cost Avoidance realized by Customer that result from activities undertaken by Honeywell prior to Final Project Acceptance, including any utility rebates or other incentives earned as a direct result of the installed ECMs or Support Services provided by Honeywell, will be applied toward the Guaranteed Savings for the First Guarantee Year.

C.3.1.2 Additional Savings After Final Project Acceptance. Additional Cost Avoidance, including any utility rebates or other incentives, that can be demonstrated, or earned, as a result of Honeywell's efforts that result in no additional costs to Customer beyond the costs identified in this Agreement will be included in the M&V Report (as defined in Section C.3.2 below) for the applicable Guarantee Year(s).

C.3.1.3 Satisfaction of Guarantee. The Guaranteed Savings in each Guarantee Year are considered satisfied if the Total Guarantee Year Savings for such Guarantee Year equals or exceeds the Annual Scheduled Savings.

C.3.1.4 Excess Savings. Excess Savings shall be carried forward and applied to any future Guarantee Year(s). In the event Honeywell has previously paid Customer for a Guaranteed Savings shortfall in a past Guarantee Year, pursuant to Section C.3.1.5, then Excess Savings in current Guarantee Year shall be billed to Customer (but only up to any amounts previously paid by Honeywell for a shortfall) and Customer shall pay Honeywell within thirty (30) days after receipt of such bill, and any remaining Excess Savings shall be carried forward and applied against Guaranteed Savings shortfalls in any future Guarantee Year.

C.3.1.5 Savings Shortfalls. In the event that the Total Guarantee Year Savings in any Guarantee Year is less than the Annual Scheduled Savings, after giving credit for any Excess Savings carried forward from previous Guarantee Years pursuant to Section C.3.1.4, Honeywell shall, upon receipt of written demand from Customer, compensate Customer the amount of any such shortfall, in such form as agreed to by the parties, limited by the total value of the Guaranteed Savings, within sixty (60) days. Resulting compensation shall be Honeywell's sole liability for any shortfall in the Guaranteed Savings. In case of a shortfall, Honeywell reserves the right, subject to Customer approval, which shall not be unreasonably withheld, to implement additional operational improvements or conservation measures, at no cost to Customer, that will generate additional savings in future years of the Guarantee Term, and Honeywell has the option of extending its M&V Services to verify successful performance.

C.3.1.6 Aggregation of Savings. The parties mutually agree that the Guaranteed Savings for this Agreement and the Guaranteed Savings for all previous active projects with guaranteed savings for this Customer shall be combined each year until the end of the original guarantee term for each project. Throughout the duration of the term for each specific phase the total savings will be utilized as an aggregate in satisfying the sum of the respective guarantees.

Guaranteed Savings Reconciliation Process

C.3.2 Guaranteed Savings Reconciliation Documentation. As part of the M&V Services, and as set forth in the M&V Plan, Honeywell will provide Customer with a Guaranteed Savings reconciliation report ("**M&V Report**") within ninety (90) days after receipt of the information Customer is to provide as part of the Customer Guarantee Practices that is reasonably necessary to the preparation of the M&V Report. Data and calculations utilized by Honeywell in the preparation of its M&V Report will be made available to Customer, along with such explanations and clarifications as Customer may reasonably request.

C.3.2.1 Acceptance of M&V Report. Customer will have forty-five (45) days to review the M&V Report and provide written notice to Honeywell of non-acceptance of the Guaranteed Savings for that Guarantee Year. Failure to provide written notice within forty-five (45) days of the receipt of the M&V Report will deem it accepted by Customer.

C.3.2.2 Guaranteed Savings Reconciliation. Guaranteed Savings will be determined in accordance with the methodology(s), operating parameters, formulas, and constants as described in this Attachment D and the exhibits, using the M&V Services as defined herein, and/or additional methodologies defined by Honeywell that may be negotiated with Customer at any time. Upon contract execution, Customer agrees to and accepts the standard methods that Honeywell uses to conduct M&V Services, including, but not limited to, RIM and Option C Utility Data Analysis (see Part C for RIM and Option C definitions as further detailed in the Measurement and Verification Plan in this Attachment D and the exhibits), as well as cost avoidance calculations, as inferenced by, referenced by or included in the energy calculations developed by Honeywell and attached hereto as an Exhibit D-5: Engineered Cost Avoidance Calculations.

C.3.2.3 Base Year Adjustments. The Baseline shall be adjusted to reflect:

(a) changes in occupied square footage;
(b) changes in energy-consuming equipment, including any repairs or improvements made to the equipment as part of this Agreement;
(c) changes in the Facilities;
(d) changes in Customer Guarantee Practices adversely affecting energy consumption and/or demonstrated operational changes;
(e) changes in weather between the Baseline Period and the Guarantee Year; and
(f) documented or otherwise conclusively established metering errors for the Baseline Period and/or any Guarantee Year adversely affecting Energy usage measurement.

C.3.2.4 Other Potential Guarantee Adjustments. Honeywell's Guaranteed Savings obligations under this Agreement are contingent upon:

(a) Customer following each of the Customer Guarantee Practices set forth herein;
(b) no alterations or additions being made by Customer to any of the M&V Systems and Equipment without prior notice to and agreement by Honeywell;
(c) The absence of any event Customer is to report under Section C.4.5; and
(d) Honeywell's ability to render services not being impaired by circumstances beyond its control.

To the extent Customer defaults in or fails to perform fully any of its obligations under the Agreement, including without limitation any of the Customer Guarantee Practices, or the occurrence of any event Customer is to report under Section C.4.5, Honeywell may, in its sole discretion, adjust its Guaranteed Savings obligation or deem it met; provided, however, that no adjustment hereunder shall be effective unless Honeywell has first provided Customer with written notice of Customer's default(s) or failure(s) to perform and Customer has failed to cure its default(s) or failure(s) to perform within thirty (30) days after the date of such notice.

In addition, if for any reason any Facility and/or utility meter covered under this Agreement is materially unoccupied, closed, or discontinued, the Savings will be deemed realized for such Facility or meter, and the Guaranteed Savings will be adjusted accordingly. Honeywell will provide written notice of such adjustment to the Customer.

C.3.2.5 Adjustments for Material Changes. In the event of any increase or decrease in energy consumption and demand for any month resulting from a reported Material Change (see Section C.4.5.1) or unreported Material Change (see Section C.3.2.6), the amount of that increase shall be subtracted from, or that decrease shall be added to, the total energy consumption and demand for that month prior to the calculation of energy savings. If a reported or unreported Material Change affected energy consumption and demand in the same calendar month in the preceding year, the *next preceding* contract year where a Material Change has not occurred will be used to compute the value of the Material Change and the energy savings for the current month.

C.3.2.6 Unreported Material Changes. In the absence of any Material Change in the Facilities or in their operations reported by Customer under Section C.4.5.1 below, energy consumption and demand should not change from year to year. Therefore, if energy consumption and demand per utility meter or submeter for any month increases by five percent (5%) or more of the Annual Scheduled Savings per meter from the Energy consumption and demand for the same month of the *preceding* year, after adjustment for changes to climactic conditions, then such increase shall be deemed to have resulted from a Material Change, except where such increase is due to equipment malfunction, faulty repair or other acts of negligence by Honeywell.

C.3.2.7 Guarantee Based on Agreement Only. Customer's request for proposal or qualifications, Honeywell's proposal and any other documents submitted by Honeywell to the Customer prior to negotiation of this Agreement are expressly excluded from and are not a part of this Agreement. The parties agree that although the Honeywell proposal may have contained scope items, guaranteed savings and M&V options other than those stated in the Agreement, the final scope of work, Schedule of Guaranteed Savings, and M&V Plan were developed jointly by the parties through negotiation. The Customer has chosen to purchase the scope of work set forth in Attachment A. The Customer accepts the Guaranteed Savings and agrees to the M&V Plan set forth herein.

C.4 Customer Guarantee Practices

C.4.1 Equipment Subject to these Provisions. M&V Systems and Equipment affecting the Guaranteed Savings include:

(a) equipment provided as per Attachment A – Scope of Work;
(b) modifications made to existing equipment as outlined in Attachment A – Scope of Work;
(c) existing or new equipment not provided or modified under this Agreement, but materially affected by the work provided per Attachment A – Scope of Work and consuming energy or water via utility meters covered by the Agreement.

C.4.2 Hours and Practices. To achieve the Savings, Honeywell and Customer agree upon the Guaranteed Period operating parameters described in Exhibit(s) D-1 and D-2. The Customer agrees to operate, or cause to effect the operation of, the M&V Systems and Equipment in such manner that is in accordance with these Guaranteed Period operating parameters.

C.4.3 Customer Maintenance and Replacement Responsibilities. During the term of this Support Services Agreement, for all equipment affecting the Guaranteed Savings, the Customer shall perform on-going maintenance and accomplish component replacement and equipment repairs in accordance with manufacturer's standards and practices and take all reasonable measures to insure the equipment is operating at full efficiency. Component replacement and equipment repairs must be accomplished in a timely fashion. Additionally, Customer shall insure such equipment is operated at all times in accordance with applicable manufacturer's specifications, Honeywell specifications, and the requirements contained herein. For all non-Honeywell maintenance actions, Customer shall document and make available to Honeywell maintenance dates and tasks accomplished, the start date and duration of all deficient equipment operation and the subsequent corrective action and/or repair dates. Customer shall replace any vandalized or any failed equipment or component no longer warranted by Honeywell or the manufacturer, with equipment or components of equal or greater efficiency value than installed by Honeywell, for the full Guarantee Term. Customer shall be responsible to investigate and correct any reported deficiencies not covered under this Support Services Agreement.

C.4.4 Facility Operational Changes. Except in the case of emergencies, Customer agrees it will not, without the consent of an authorized representative of Honeywell:

(a) make any significant deviations from the applicable Customer Guarantee Practices;
(b) put any system or item of equipment in a permanent "on" position, if the same would constitute a deviation from the applicable Customer Guarantee Practices; or
(c) assume manual control of any energy management system or item of equipment, if the same would constitute a deviation from the applicable Customer Guarantee Practices.

C.4.5 Customer Reporting Responsibilities. Customer shall report to Honeywell in writing within fifteen (15) days of the following changes or events:

(a) any additional energy source or change in existing energy source or supplier that the Customer may negotiate during the term of this Guarantee and/or,
(b) any material change in system or equipment status, including replacement of, addition to, or modification of existing energy and/or water consuming systems or equipment and/or,
(c) any long term temporary (equal to or greater than 10 days) or permanent changes in operating schedules and/or,
(d) any material changes in the payment schedule, such as due to refinancing or variable interest rate and/or,
(e) for any reason any Facility and/or utility meter covered under this Agreement is materially unoccupied, closed, or discontinued

Customer shall promptly notify Honeywell of any other activities known to Customer which could adversely impact the ability to realize the Guaranteed Savings.

C.4.5.1 Reported Material Changes. Customer shall deliver to Honeywell a written notice describing and explaining all actual or proposed Material Changes (as defined above in Section C.1) in a Facility or in the operations in a Facility and their anticipated effect on Energy or Operational Costs. Said notice must be delivered to Honeywell no less than seven (7) days before any actual or proposed Material Change occurs.

C.4.6 Customer Granted Access for Remote Diagnostics. Customer shall allow Honeywell to perform remote diagnostics on all equipment associated with the Guaranteed Savings for operational compliance with the manufacturer's specifications, and the requirements contained herein. Customer is responsible for implementation and costs for remote Honeywell access through Customer's firewall(s) to the controllers and front-end computer(s) for one (1) remote user designated by Honeywell using one or more of the following processes:

- TCP/IP Remote Access: A dedicated static IP address, installation and on-going maintenance and subscription and licensing fees for access to hardware and software and one (1) station license dedicated to the remote user, or
- Phone Lines: To be provided by customer for off-site monitoring, up to two (2) lines for each front end, as needed, one (1) line for each separate remote bus, as well as on-going maintenance of the lines.

If remote access is interrupted, at any time during the Guarantee Term, Honeywell reserves the right to suspend any reporting requirements until remote access has been restored.

C.4.7 Customer Provided Documentation. It will be the responsibility of the Customer to provide to an individual designated by Honeywell on a minimum monthly basis (unless noted otherwise):

(a) Verification that equipment installed to perform the ECMs has been properly maintained, including but limited to provision of maintenance records.
(b) Current status of the buildings (i.e., occupancy level and use, hours of operation, etc.).
(c) Records of customer-initiated changes in equipment setpoints, start/stop conditions, usage patterns.
(d) Records of customer-initiated changes in operation of mechanical systems, which may impact the ECMs.
(e) Records regarding addition or deletion of equipment or building structure, which may impact the ECMs or the building energy consumption.
(f) Copies of monthly utility bills and utility summary data on a *monthly* basis, and fuel storage tank levels, including without limitation fuel oil and biomass levels, in each case within two (2) weeks following the Customer's receipt thereof, and access to utility accounts through an authorization by the Customer to the Utility to allow the release of data to a Honeywell representative, together with access to relevant records relating to such utility costs.
(g) Access to any maintenance records, drawings, control system trend data, or other data reasonably deemed necessary by Honeywell to perform the M&V Services.

C.4.8 Customer Governmental Unit Reporting Responsibilities. Customer is solely responsible for reports to be submitted to the Department of Commerce, Public Utilities/Services Commission, or any other governmental agency or governmental unit.

C.4.9 Customer Rebate and Ratchet Reset Responsibilities. It is understood that all energy rebates, refunds, and/or federal, state, or local tax credits (including, without limitation, any energy credits or investment tax credits) are the result of an agreement between Customer and the utility company and/or between the Customer and the Federal Government (Treasury Department). Honeywell will assist the Customer with the preparation of the required application documents but Honeywell assumes no responsibility for obtaining said rebates, refunds, and/or federal, state, or local tax credits (including, without limitation, any energy credits or investment tax credits). It is understood that said rebates, refunds, and/or federal, state, or local tax credits (including, without limitation, any energy credits or investment tax credits) are not included in the Guaranteed Savings. The Customer is responsible for procuring a ratchet reset from the local utility company, as applicable.

C.4.10 Customer Gas Supply Vendor Switchover Responsibilities. All work necessary to secure the proposed supplier rate, per Exhibit D-5, by switching from Gateway Energy to National Grid for Roosevelt Middle School, Washington-Rose ES, and Ulysses Byas ES, shall be the responsibility of the Customer to be in effect PRIOR to start of the Year 1 guarantee period. See subparagraph D.1.1.1 (C).

PART D. SCHEDULE OF GUARANTEED SAVINGS

D.1. Schedule of Guaranteed Savings

The Guaranteed Savings over the Guaranteed Term is equal to or greater than $23,316,343. The Guaranteed Savings and the Annual Scheduled Savings are set forth in the table below (such table, the "**Schedule of Guaranteed Savings**"):

YEAR	ENERGY	OPERATIONAL	TOTAL
1	$ 1,053,939	$ 63,143	$ 1,117,082
2	$ 1,071,749	$ 64,406	$ 1,136,155
3	$ 1,089,867	$ 65,694	$ 1,155,561
4	$ 1,108,298	$ 67,008	$ 1,175,306
5	$ 1,127,047	$ 68,348	$ 1,195,395
6	$ 1,146,120	$ 69,715	$ 1,215,835
7	$ 1,165,524	$ 71,109	$ 1,236,633
8	$ 1,185,262	$ 72,531	$ 1,257,793
9	$ 1,205,343	$ 73,982	$ 1,279,325
10	$ 1,225,772	$ 75,462	$ 1,301,234
11	$ 1,246,555	$ 76,971	$ 1,323,526
12	$ 1,267,696	$ 78,510	$ 1,346,206
13	$ 1,289,204	$ 80,080	$ 1,369,284
14	$ 1,311,085	$ 81,682	$ 1,392,767
15	$ 1,333,346	$ 83,316	$ 1,416,662
16	$ 1,355,993	$ 84,982	$ 1,440,975
17	$ 1,379,033	$ 86,682	$ 1,465,715
18	$ 1,402,473	$ 88,416	$ 1,490,889
TOTALS	**$ 21,964,306**	**$ 1,352,037**	**$ 23,316,343**

Provided however, that, notwithstanding the above, in no event shall the Guaranteed Savings exceed the total Retrofit Costs over the Guaranteed Term. For sake of clarity, actual or pro forma budget neutral or positive cash flows are not guaranteed.

D.1.1 Energy Savings. The first year amount of Savings for Energy Costs is the sum of the below listed ECMs. Actual Savings may be lower than as set forth in the Schedule of Guaranteed Savings because of an 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 Section D.2). The Guaranteed Savings are less than the projected Savings, represented in Exhibit D-5. Cost Avoidance is based on the Customer Guarantee Practices set forth in Section C.4.

Att A No. [a]	ECM Description	Electric Year 1	Nat Gas Year 1	Propane Year 1	Fuel Oil Year 1	Water Year 1	Total Year 1
1	LED Lighting and Lighting Controls Upgrade	$ 192,219	$ (4,928)	$0	$0	$0	**$ 187,291**
2	Boiler Plant Upgrades	$0	$ 40,272	$0	$0	$0	**$ 40,272**
3	DHW Heater Upgrades	$0	$ 789	$0	$0	$0	**$ 789**
4	Mechanical Upgrades	$ 3,590	$0	$0	$0	$0	**$ 3,590**
5	Install De-Stratification Fans	$ (573)	$ 3,944	$0	$0	$0	**$ 3,371**
6	Building Management System Upgrades	$ 69,731	$ 85,995	$0	$0	$0	**$ 155,726**
7	DHW Heater Upgrades	$ 1,293	$ 6,242	$0	$0	$0	**$ 7,535**
8	Pipe Insulation	$0	$ 7,738	$0	$0	$0	**$ 7,738**
9	Install Walk-In Freezer/Coolers Controllers	$ 6,796	$0	$0	$0	$0	**$ 6,796**
10	Install Solar PV System	$ 640,831	$0	$0	$0	$0	**$ 640,831**
	Totals	**$ 913,887**	**$ 140,052**	**$ 0**	**$ 0**	**$ 0**	**$1,053,939**

[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, 2% per year for gas utilities, and 2% per year for water or sewer utilities, used in the determination of Cost Avoidance each year.

D.1.1.1 Calculating Cost Avoidance

(a) Customer agrees that the baseline for the unit cost of Utilities will be adjusted each year of the Guarantee Term to reflect a stipulated escalation of 2% per year for the unit cost of electric, natural gas, and fuel oil. This annually adjusted value of Energy unit cost is stipulated as the new baseline in each succeeding year and may be used in the determination of Cost Avoidance each year in accordance with section D.1.1.1(b).

(b) The calculation of Cost Avoidance is based upon the utility rate paid during the Guarantee Year, or the Baseline Period utility rate plus escalation (represented in Exhibit D-3 Contractual Baseline Conditions, Utility Use, Utility Unit Costs), whichever produces the highest Cost Avoidance and/or as defined below:

(i) The Guarantee Year current rate for Option A will be the annual average determined from 12 months of utility billing data in that Guarantee Year. Customer will provide the utility data per Section C.4.7 and if such data is not provided, the baseline utility rate plus annual escalation (see paragraph D.1.1.1 (a)) shall be used.

(ii) Option A analysis for all ECMs will use $/kW and unblended $/kWh for electric to monetize demand and energy savings. For buildings with thermal savings for ECM 1 Lighting (Heating Penalty) only, cost avoidance will be calculated using the baseline rate in Exhibit D-3 Contractual Baseline Conditions, Utility Use, Utility Unit Costs, escalated as indicated in section D.1.1.

(iii) Option C analysis utilizes Metrix™, an independent 3rd party industry-standard utility accounting and normalization software platform. The energy and cost avoidance for Option C analysis using Metrix or otherwise is determined on a monthly basis. Energy Avoidance is monetized by comparing the blended unit cost from each month's utility bill with the baseline contractual rate, escalated per section D.1.1.1 (a), to determine the rate to use for calculation of monthly cost avoidance per section D.1.1.1 (b).

(c) Natural gas supplier switch to National Grid: as per paragraph C.4.10, all work necessary to secure the proposed supplier rate, per Exhibit D-5, by switching from Gateway Energy to National Grid for Roosevelt Middle School, Washington-Rose ES, and Ulysses Byas ES, shall be the responsibility of the Customer to be in effect PRIOR to start of the Year 1 guarantee period. If supplier switchover is not completed PRIOR to start of the Year 1 guarantee period, then the proposed unit costs as shown in Exhibit D-5-2 for Washington-Rose ES and Roosevelt Middle School AND in Exhibit D-5-6 for Ulysses Byas ES will be used to monetize the savings.

(d) 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 Honeywell involvement. In case the Customer does not procure any ratchet reset, rate change or other utility tariff charge reduction, or in the event that such ratchet, rate or tariff changes before the Guarantee Period ends, Cost Avoidance nonetheless will be calculated as if the ratchet, rate or tariff has been reset at the end of the installation of demand-reducing ECMs, or continues, as applicable.

(e) In the event, the current Guarantee Year utility tariff is significantly changed in structure from that which existed during the Baseline Period, including, but not limited to, the addition or deletion of measured or billed demand structures, Time of Use, Seasonal or Block & Tail billing structures, the Customer will not unreasonably withhold acceptance to abandon the new tariff (i.e., Current Rate) and will only use the baseline plus escalator as described in section D.1.1.1 (a).

(f) The constants and/or stipulated values defined in the Exhibits, or as defined herein, are mutually agreed to by the Customer to be reasonable and may be used in the determination of Cost Avoidance.

D.1.1.2 Acceptance of Measurement & Verification Methods

Upon contract execution, Customer accepts the standard methods that Honeywell uses to conduct Retrofit Isolation Method (RIM) and Option C Measurement & Verification (M&V), as well as cost avoidance calculations, as described herein and inferenced by or included in the energy calculations and regression models attached hereto. Customer has the right and may to hire a consultant to review the calculations and comment before the contract is signed and the

price accepted. Any future use of a consultant to review M&V methods and work product is at Customer's discretion and expense. Customer agrees that any such consultant's review shall be limited to the M&V methods as selected by the Customer prior to contract execution and as detailed and defined in this Agreement.

D.1.2 Operational Cost Savings. The first-year amount of Savings for Operational Costs is the sum of the below listed ECMs. The Savings are based on the Customer Guarantee Practices set forth in Section C.4. The Operational Costs Savings described below and identified in Section D.1 are deemed satisfied upon execution of the Main Agreement. 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, and that, in doing so, it would incur Operational Costs of at least the amount per year over the Guarantee Term as presented below and in the Schedule of Guaranteed 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 Costs Savings categorized as capital cost avoidance are part of, or are causally connected to the 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 Operational Costs will be adjusted each year of the Guarantee Term. This annually adjusted value of operational unit costs is stipulated as the new baseline in each succeeding year. Customer agrees that the Baseline adjustment is stipulated to be an escalation of 2% per year for Operational Costs used in the determination of Operational Costs Savings each year.

The Operational Costs Savings were identified, reviewed, and agreed to by a team of Customer's representatives including Gary Gentles – Assistant Superintendent for Business & Operations and Warren Young – Director of Facilities.

OSD #	Operational Savings Description (OSD)	Att. A Ref.	Cost Avoidance Category (O&M, Capital,)	1st Year Cost Avoidance
1	LED Lighting and Lighting Controls Upgrade	1	O&M	$20,057
2	Boiler Plant Upgrades	2	O&M	$5,000
3	Mechanical Upgrades	4	O&M	$5,000
4	Building Management System Upgrades	5	O&M	$33,086
			Total	**$63,143**

[a] O&M: operations and maintenance.

D.2 Baseline Operations and Adjustments

D.2.1 "Baseline Operating Parameters" are the Facility(ies) and system(s) operations measured and/or observed before commencement of the Work. Baseline Operating Parameters are stipulated in, and incorporated herein, as Exhibit D-1. See Energy Savings Calculations, attached hereto and incorporated herein as Exhibit D-5 for further information regarding stipulated Baseline Operating Parameters.

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 Term. Honeywell and Customer agree that the Baseline 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 Warren Young – Director of Facilities.

The Baseline Period is defined as 07/2021 to 06/2022.

The 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.

D.2.2 Pre-Retrofit Baseline Adjustments: Reserved

D.2.3 Post-Retrofit Baseline Adjustments: Reserved

D.3 Guarantee Term Operations

D.3.1 "Guarantee Term Operating Parameters" are the Facility(ies) and system(s) operations as measured and/or observed after completion of Work. The data summarized will be used in the calculation of the post-retrofit Energy consumption and/or demand. Honeywell and Customer agree that the Guarantee Term Operating Parameters specified in this section are representative of equipment operating characteristics during the Guarantee Term 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 Guarantee Term Operating Parameters outlined in this section.

Guarantee Term Operating Parameters are stipulated in Guarantee Period Operating Parameters attached hereto and incorporated herein as Exhibit D-2.

D.3.2 Operational Cost Avoidance: The following parameters, methodologies, and/or calculations were used in determining the Operational Costs and/or Cost Avoidance due to the Retrofit and Support Services implementation and are agreed to be reasonable and may be used in the calculation of Savings.

Operational Costs Savings 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 and Lighting Controls 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.	D-6
2	Boiler Plant Upgrades	Reduction in current repair and preventive maintenance spend on the existing equipment.	D-6
3	Mechanical Upgrades	Reduction in current repair spend on the existing equipment.	D-6
4	Building Management System Upgrades	Reduction in current repair spend on the existing District-wide BMS, elimination of JACE license upgrades with transition from JAVA to HTML, and a reduction in staff OT labor with comprehensive remote monitoring capabilities.	D-6

[a] O&M: operations and maintenance.

D.4 Other Energy and Operational Savings Measures: Reserved.

ATTACHMENT E
PAYMENT SCHEDULE

1. The following payment schedule has been established for the Work:

1.1 The payment schedule reflected below has been established for the Work. Payment shall be made net thirty (30) days of the invoice date. If issues surrounding lack of payment are not remedied within ten (10) business days, HONEYWELL may suspend all work until payment is made.

Total payments are: $23,350,000

Honeywell's price is based upon the contract being signed and the financing being secured by June 30, 2023. Should any of these events be delayed beyond that date Honeywell reserves the right to adjust its price subject to Customer's written approval. Any change to the contract price shall be documented by a change order signed by both parties.

1.2 Progress Payments

	Percentage Due	**Amount Due**
Initial Payment upon Contract Signature and securing of Financing:	50%	$11,675,000
Monthly Progress Payments:	50%	$11,675,000
Total Payments:		**$23,350,000**

The entire contract price less the initial payment will be billed monthly as a percentage complete by ECM using the approved Schedule of Values established through the NYSED review process. HONEYWELL shall be paid the amount of each monthly progress payment due HONEYWELL less five percent (5%) retainage (no retainage shall be held on the initial payment). Following the end of each month, during the construction period of the Project, HONEYWELL will provide to CUSTOMER *an application for payment using an AIA Document G702 or equivalent form*, together with a list in sufficient detail to reasonably identify the work performed, ECMs or portions thereof installed during that month, and all applicable payroll certifications in accordance with Article 8 of the NYS Labor Law. Within thirty (30) days after the invoice has been approved by ECG and CUSTOMER, CUSTOMER shall pay or cause to be paid to HONEYWELL the undisputed amount due under such invoice. If issues surrounding lack of payment of an undisputed amount are not remedied within ten (10) business days, HONEYWELL may suspend all Work until payment is made. HONEYWELL shall invoice an ECM's retainage amount after the date of the Substantial Completion Certificate for that particular ECM, and CUSTOMER shall pay or cause to be paid to HONEYWELL said amount within thirty (30) days after receipt of said invoice.

ENGINEER OF RECORD. The Customer has identified ECG Engineering, P.C., as the certified Engineer of Record (the "Engineer") to provide architectural/engineering services in connection with the Work to be performed by Honeywell. The fees and total compensation for such Architectural/Engineering Services shall be $1,111,905 and shall be paid by Honeywell to the Engineer in accordance with the following schedule:

30% upon Customer signing contract with Honeywell
30% upon submittal of plans and specifications to NYSED
30% upon NYSED approval
10% upon substantial completion

The above increments shall be paid by Honeywell to the Engineer within thirty (30) days of the stated milestone. Invoices that have not been paid within forty-five (45) days of receipt of such invoice shall be subject to interest at a rate of 18% per annum.

2. The following payment schedule has been established for Support Services:

2.1 The first invoice will be issued upon completion of the Work and prior to commencement of Support Services and CUSTOMER shall pay or cause to be paid to HONEYWELL the price for the Services as specified in Attachment D.

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ATTACHMENT J
PROJECT ACCEPTANCE PROCEDURE

As portions of the Project near completion, the Honeywell Project Manager will start the project close-out process.

The following Exhibits and Tables are attached hereto and made a part of the Agreement:

Exhibit J-1	Schedule of Substantial Completion Acceptance
Exhibit J-2	Certificate of Substantial Completion
Exhibit J-3	Final Project Acceptance Certificate

A.1 Substantial Completion Procedure

The Honeywell Project Manager shall use the Scope-of-Work (SOW) listed in Attachment A as the basis for the close-out process and shall demonstrate to the Customer's Representative that each separate item of the SOW is substantially complete. The sign off process will be by portion of the Scope of Work, by building/site/Equipment Unit or by individual Energy Conservation Measure (ECM) as listed in Exhibit J-1 below. After each portion of the Scope of Work has been demonstrated and a "Punch List" detailing minor deficiencies, if any, is generated, the Customer's Representative shall execute the Exhibit J-2 Certificate of Substantial Completion (CSC) to acknowledge substantial completion and Honeywell will complete the "Punch List" within two weeks. Exhibit J-1 based on the Customer's signature dates will track the progress towards Final Project Acceptance. Warranty shall start in accordance with the terms of the Agreement.

Exhibit J-1

SCHEDULE OF SUBSTANTIAL COMPLETION

Schedule of Substantial Completion: The acceptance process will be performed according to the following schedule.

Schedule of Certificates of Substantial Completion (CSC)		
Scope of Work Segmentation	**CSC Acceptance By:**	**Punchlist Acceptance By:**
ECM 1: LED Lighting and Lighting Controls Upgrade		
ECM 2: Boiler Plant Upgrades		
ECM 3: DHW Heater Upgrades		
ECM 4: Mechanical Upgrades		
ECM 5: Install De-Stratification Fans		
ECM 6: Building Management System Upgrades		
ECM 7: Building Envelope Improvements		
ECM 8: Pipe Insulation		
ECM 9: Install Walk In Freezer / Cooler Controllers		
ECM 10: Install Solar PV Systems		

A.2 Final Project Acceptance Procedure

Once Exhibit J-1 and all punch lists are complete the Honeywell Project Manager and Customer shall use Exhibit J-3 to signify Final Project Acceptance.

Exhibit J-2

CERTIFICATE OF SUBSTANTIAL COMPLETION

Project Name: _____

Building/Site/Equipment Unit or individual Energy Conservation Measure (ECM): _____

To: Honeywell International Inc.

Reference is made to the above listed Agreement between the undersigned and Honeywell International Inc. and to the Scope of Work as defined in Attachment A herein. In connection therewith, we confirm to you the following:

1. The Building/Site/Equipment Unit or individual Energy Conservation Measure (ECM) referenced above and also listed in Attachment A of the Agreement has been demonstrated to the satisfaction of the Customer's Representative as being substantially complete.
2. The Punch List [circle which applies]:
   (a) has been developed by the parties and delivered to Honeywell and the deficiencies noted therein will be corrected within 2 weeks of the date hereon; or
   (b) has not been developed by the parties and delivered to Honeywell but will be developed and delivered on or before _____, 202_ after which the deficiencies noted therein will be corrected within 2 weeks of the date thereon.
3. All of the Work has been delivered to and received by the undersigned and that said Work has been examined and /or tested and is in good operating order and condition and is in all respects satisfactory to the undersigned and as represented, and that said Work has been accepted by the undersigned and complies with all terms of the Agreement. Consequently, you are hereby authorized to invoice for payment, as defined in Attachment E, Payment Schedule.
4. Warranty shall start in accordance with the terms of the Agreement.
5. If Customer will be self-performing maintenance on equipment associated with this ECM, then as of the date of Customer signature the Customer is responsible for maintenance.
6. If Honeywell will be performing maintenance on equipment associated with this ECM, then Honeywell will start the Support Services Agreement on the Support Services Effective Date as defined in accordance with Attachment D.

Customer Name: _____

By: _____	_____
(Authorized Signature)	(Authorized Signature)
_____	_____
(Printed Name and Title)	(Printed Name and Title)
_____	_____
(Date)	(Date)

Exhibit J-3

FINAL PROJECT ACCEPTANCE CERTIFICATE

Project Name: _____

Scope-of-Work (SOW): _____

To: Honeywell International Inc.

Reference is made to the above listed Agreement between the undersigned and Honeywell International Inc. and to the Scope of Work as defined in Attachment A herein. In connection therewith, we confirm to you the following:

1. The entirety of the Scope of Work (SOW) referenced above and set forth in Attachment A of the Agreement has been demonstrated to the satisfaction of the Customer's Representative as being accepted as is evidenced by Customer's signature on Certificates of Substantial Completion for the entirety of the Work.
2. The Punch List(s) has been completed.
3. You are hereby authorized to invoice for Final Payment, as defined in Attachment E, Payment Schedule.
4. The date of Customer's signature below shall be known as the date of Final Project Acceptance.

Customer Name:

By: _____
(Authorized Signature)

_____
(Printed Name and Title)

_____
(Date)

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EXHIBIT D-1 & D-2
BASELINE OPERATING PARAMETERS & GUARANTEE PERIOD OPERATING PARAMETERS

Roosevelt High School

The existing HVAC system operating schedule is generally from 6:00am to 9:00pm Monday through Friday. During the guarantee period, the HVAC system operating schedule shall be 6:00am to 6:00pm Monday through Friday, with unoccupied operation during all other hours.

The existing occupied heating setpoint is 71°F and the unoccupied heating setpoint is 60°F. During the guarantee period, the occupied heating setpoint shall be 68°F and the unoccupied heating setpoint shall be 55°F.

The existing Cooling setpoints are estimated at 73°F occupied and 80°F unoccupied. During the guarantee period, the occupied cooling setpoint shall be 76°F and the unoccupied cooling setpoint shall be 85°F.

Existing schedules and setpoints are based on detailed review of Building Management Systems/thermostats and interviews with staff.

Proposed schedules are based on information provided by the Facilities Department.

WEEKDAY		**WEEKEND**	
Existing HVAC Start Time	**Proposed HVAC Start Time**	**Existing HVAC Start Time**	**Proposed HVAC Start Time**
6:00am	6:00am	Unoccupied	Unoccupied
Existing HVAC Stop Time	**Proposed HVAC Stop Time**	**Existing HVAC Stop Time**	**Proposed HVAC Stop Time**
9:00pm	6:00pm	Unoccupied	Unoccupied

HEATING		**COOLING**	
Existing Occupied Setpoint	**Proposed Occupied Setpoint**	**Existing Occupied Setpoint**	**Proposed Occupied Setpoint**
71°F	68°F	73°F	76°F
Existing Unoccupied Setpoint	**Proposed Unoccupied Setpoint**	**Existing Unoccupied Setpoint**	**Proposed Unoccupied Setpoint**
60°F	55°F	80°F	85°F

Notes:

1) *All HVAC system run times allow for a minimum of one (1) hour warm up period prior to occupant arrival.*
2) *Evening and weekend events in isolated areas (i.e. gymnasiums, cafeterias, auditoriums, etc.) shall be separately scheduled for occupancy wherever possible to prevent having to set the entire building into occupied mode.*
3) *Guaranteed contractual savings are based on the proposed schedules and setpoints listed in the tables above.*

EXHIBIT D-1 & D-2
BASELINE OPERATING PARAMETERS & GUARANTEE PERIOD OPERATING PARAMETERS

Roosevelt Middle School

The existing HVAC system operating schedule is generally from 3:00am to 12:00am Monday through Friday. During the guarantee period, the HVAC system operating schedule shall be 6:00am to 6:00pm Monday through Friday, with unoccupied operation during all other hours.

The existing occupied heating setpoint is 72°F and the unoccupied heating setpoint is 60°F. During the guarantee period, the occupied heating setpoint shall be 68°F and the unoccupied heating setpoint shall be 55°F.

The existing Cooling setpoints are estimated at 74°F occupied and 80°F unoccupied. During the guarantee period, the occupied cooling setpoint shall be 76°F and the unoccupied cooling setpoint shall be 85°F.

Existing schedules and setpoints are based on detailed review of Building Management Systems/thermostats and interviews with staff.

Proposed schedules are based on information provided by the Facilities Department.

WEEKDAY		**WEEKEND**	
Existing HVAC Start Time	**Proposed HVAC Start Time**	**Existing HVAC Start Time**	**Proposed HVAC Start Time**
3:00am	6:00am	Unoccupied	Unoccupied
Existing HVAC Stop Time	**Proposed HVAC Stop Time**	**Existing HVAC Stop Time**	**Proposed HVAC Stop Time**
12:00am	6:00pm	Unoccupied	Unoccupied

HEATING		**COOLING**	
Existing Occupied Setpoint	**Proposed Occupied Setpoint**	**Existing Occupied Setpoint**	**Proposed Occupied Setpoint**
72°F	68°F	74°F	76°F
Existing Unoccupied Setpoint	**Proposed Unoccupied Setpoint**	**Existing Unoccupied Setpoint**	**Proposed Unoccupied Setpoint**
60°F	55°F	80°F	85°F

Notes:

1) *All HVAC system run times allow for a minimum of one (1) hour warm up period prior to occupant arrival.*
2) *Evening and weekend events in isolated areas (i.e. gymnasiums, cafeterias, auditoriums, etc.) shall be separately scheduled for occupancy wherever possible to prevent having to set the entire building into occupied mode.*
3) *Guaranteed contractual savings are based on the proposed schedules and setpoints listed in the tables above.*

EXHIBIT D-1 & D-2
BASELINE OPERATING PARAMETERS & GUARANTEE PERIOD OPERATING PARAMETERS

Centennial Ave Elementary School

The existing HVAC system operating schedule is generally from 5:30am to 9:30pm Monday through Friday. During the guarantee period, the HVAC system operating schedule shall be 6:00am to 4:00pm Monday through Friday, with unoccupied operation during all other hours.

The existing occupied heating setpoint is 71°F and the unoccupied heating setpoint is 60°F. During the guarantee period, the occupied heating setpoint shall be 68°F and the unoccupied heating setpoint shall be 55°F.

The existing Cooling setpoints are estimated at 72°F occupied and 80°F unoccupied. During the guarantee period, the occupied cooling setpoint shall be 76°F and the unoccupied cooling setpoint shall be 85°F.

Existing schedules and setpoints are based on detailed review of Building Management Systems/thermostats and interviews with staff.

Proposed schedules are based on information provided by the Facilities Department.

WEEKDAY		**WEEKEND**	
Existing HVAC Start Time	**Proposed HVAC Start Time**	**Existing HVAC Start Time**	**Proposed HVAC Start Time**
5:30am	6:00am	Unoccupied	Unoccupied
Existing HVAC Stop Time	**Proposed HVAC Stop Time**	**Existing HVAC Stop Time**	**Proposed HVAC Stop Time**
9:30pm	4:00pm	Unoccupied	Unoccupied

HEATING		**COOLING**	
Existing Occupied Setpoint	**Proposed Occupied Setpoint**	**Existing Occupied Setpoint**	**Proposed Occupied Setpoint**
71°F	68°F	72°F	76°F
Existing Unoccupied Setpoint	**Proposed Unoccupied Setpoint**	**Existing Unoccupied Setpoint**	**Proposed Unoccupied Setpoint**
60°F	55°F	80°F	85°F

Notes:

1) *All HVAC system run times allow for a minimum of one (1) hour warm up period prior to occupant arrival.*
2) *Evening and weekend events in isolated areas (i.e. gymnasiums, cafeterias, auditoriums, etc.) shall be separately scheduled for occupancy wherever possible to prevent having to set the entire building into occupied mode.*
3) *Guaranteed contractual savings are based on the proposed schedules and setpoints listed in the tables above.*

EXHIBIT D-1 & D-2
BASELINE OPERATING PARAMETERS & GUARANTEE PERIOD OPERATING PARAMETERS

Ulysses Byas Elementary School

The existing HVAC system operating schedule is generally from 5:30am to 7:00pm Monday through Friday. During the guarantee period, the HVAC system operating schedule shall be 6:00am to 4:00pm Monday through Friday, with unoccupied operation during all other hours.

The existing occupied heating setpoint is 71°F and the unoccupied heating setpoint is 60°F. During the guarantee period, the occupied heating setpoint shall be 68°F and the unoccupied heating setpoint shall be 55°F.

The existing Cooling setpoints are estimated at 74°F occupied and 80°F unoccupied. During the guarantee period, the occupied cooling setpoint shall be 76°F and the unoccupied cooling setpoint shall be 85°F.

Existing schedules and setpoints are based on detailed review of Building Management Systems/thermostats and interviews with staff.

Proposed schedules are based on information provided by the Facilities Department.

WEEKDAY		**WEEKEND**	
Existing HVAC Start Time	**Proposed HVAC Start Time**	**Existing HVAC Start Time**	**Proposed HVAC Start Time**
5:30am	6:00am	Unoccupied	Unoccupied
Existing HVAC Stop Time	**Proposed HVAC Stop Time**	**Existing HVAC Stop Time**	**Proposed HVAC Stop Time**
7:00pm	4:00pm	Unoccupied	Unoccupied

HEATING		**COOLING**	
Existing Occupied Setpoint	**Proposed Occupied Setpoint**	**Existing Occupied Setpoint**	**Proposed Occupied Setpoint**
71°F	68°F	74°F	76°F
Existing Unoccupied Setpoint	**Proposed Unoccupied Setpoint**	**Existing Unoccupied Setpoint**	**Proposed Unoccupied Setpoint**
60°F	55°F	80°F	85°F

Notes:

1) *All HVAC system run times allow for a minimum of one (1) hour warm up period prior to occupant arrival.*
2) *Evening and weekend events in isolated areas (i.e. gymnasiums, cafeterias, auditoriums, etc.) shall be separately scheduled for occupancy wherever possible to prevent having to set the entire building into occupied mode.*
3) *Guaranteed contractual savings are based on the proposed schedules and setpoints listed in the tables above.*

EXHIBIT D-1 & D-2
BASELINE OPERATING PARAMETERS & GUARANTEE PERIOD OPERATING PARAMETERS

Washington-Rose Elementary School

The existing HVAC system operating schedule is generally from 12:00am to 12:00am Sunday through Saturday. During the guarantee period, the HVAC system operating schedule shall be 6:00am to 4:00pm Monday through Friday, with unoccupied operation during all other hours.

The existing occupied heating setpoint is 71°F and the unoccupied heating setpoint is 60°F. During the guarantee period, the occupied heating setpoint shall be 68°F and the unoccupied heating setpoint shall be 55°F.

The existing Cooling setpoints are estimated at 74°F occupied and 80°F unoccupied. During the guarantee period, the occupied cooling setpoint shall be 76°F and the unoccupied cooling setpoint shall be 85°F.

Existing schedules and setpoints are based on detailed review of Building Management Systems/thermostats and interviews with staff.

Proposed schedules are based on information provided by the Facilities Department.

WEEKDAY		**WEEKEND**	
Existing HVAC Start Time	**Proposed HVAC Start Time**	**Existing HVAC Start Time**	**Proposed HVAC Start Time**
12:00am	6:00am	12:00am	Unoccupied
Existing HVAC Stop Time	**Proposed HVAC Stop Time**	**Existing HVAC Stop Time**	**Proposed HVAC Stop Time**
12:00am	4:00pm	12:00am	Unoccupied

HEATING		**COOLING**	
Existing Occupied Setpoint	**Proposed Occupied Setpoint**	**Existing Occupied Setpoint**	**Proposed Occupied Setpoint**
71°F	68°F	74°F	76°F
Existing Unoccupied Setpoint	**Proposed Unoccupied Setpoint**	**Existing Unoccupied Setpoint**	**Proposed Unoccupied Setpoint**
60°F	55°F	80°F	85°F

Notes:

1) *All HVAC system run times allow for a minimum of one (1) hour warm up period prior to occupant arrival.*
2) *Evening and weekend events in isolated areas (i.e. gymnasiums, cafeterias, auditoriums, etc.) shall be separately scheduled for occupancy wherever possible to prevent having to set the entire building into occupied mode.*
3) *Guaranteed contractual savings are based on the proposed schedules and setpoints listed in the tables above.*

Exhibit D-3: Contractual Baseline Conditions, Utility Use, Utility Unit Costs

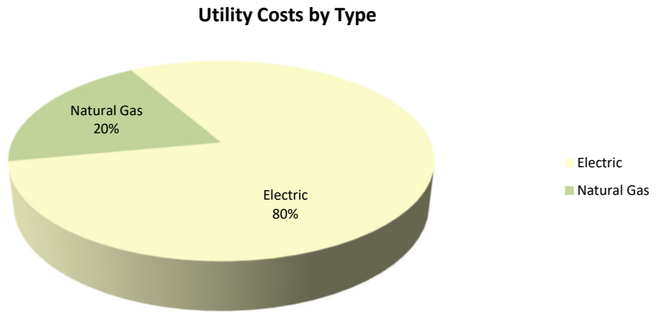
Roosevelt UFSD, NY
Exhibit D-3: Contractual Baseline Conditions, Utility Use, Utility Unit Costs
Utility Summary
July 2021 through June 2022
FY 21/22

Building	Square Footage	Electric								Fuel Designation	Natural Gas				Total Thermal				Total Energy		
		Total Cost	Total kWh	Demand Cost	Fixed Costs	Total kW Demand	Demand Months	$/kW	$/kWh	Main Heating Utility	Total Cost	Fixed Costs	Total Therms	$/Therm	Total Cost	MMBtu/ Yr Total	$/MMBtu	$ per Square Ft	$/Sq ft	kBtu/sq ft	Total Cost
Centennial Avenue Elementary School	101,940	$ 229,108	1,051,200	$ 59,557	$ 13,431	3,362	11	$ 17.71	$ 0.149	Natural Gas	$ 36,802	$ 491	33,673	$ 1.08	$ 36,802	3,367	$ 10.93	$ 0.36	$ 2.61	68.23	$ 265,910
Washington-Rose Elementary School	92,000	$ 235,989	1,139,200	$ 54,943	$ 13,074	2,892	11	$ 19.00	$ 0.147	Natural Gas	$ 71,757	$ 943	53,668	$ 1.32	$ 71,757	5,367	$ 13.37	$ 0.78	$ 3.35	100.60	$ 307,745
Ulysses Byas Elementary School	93,000	$ 187,479	861,920	$ 50,242	$ 11,774	2,756	11	$ 18.23	$ 0.146	Natural Gas	$ 70,676	$ 486	54,585	$ 1.29	$ 70,676	5,459	$ 12.95	$ 0.76	$ 2.78	90.33	$ 258,155
Roosevelt Middle School	162,000	$ 486,905	2,495,040	$ 99,846	$ 20,493	5,433	11	$ 18.38	$ 0.147	Natural Gas	$ 100,143	$ 463	79,011	$ 1.26	$ 100,143	7,901	$ 12.67	$ 0.62	$ 3.62	101.34	$ 587,048
Roosevelt High School	211,500	$ 419,744	2,037,280	$ 101,393	$ 19,346	5,946	11	$ 17.05	$ 0.147	Natural Gas	$ 102,078	$ 8,660	91,656	$ 1.02	$ 102,078	9,166	$ 11.14	$ 0.48	$ 2.47	76.21	$ 521,822
TOTALS	**660,440**	**$ 1,559,224**	**7,584,640**	**$ 365,982**	**$ 78,118**	**20,389**		**$ 17.95**	**$ 0.147**		**$ 381,457**	**$ 11,042**	**312,593**	**$ 1.18**	**$ 381,457**	**31,259**	**$ 12.20**	**$ 0.58**	**$ 2.94**	**86.53**	**$ 1,940,681**

Electric	**$ 1,559,224**
Natural Gas	**$ 381,457**
Total	**$ 1,940,681**

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/Gallon
Wood Chips	**9,200,000**	BTU/Ton
Wood Pellets	**15,980,000**	BTU/Ton

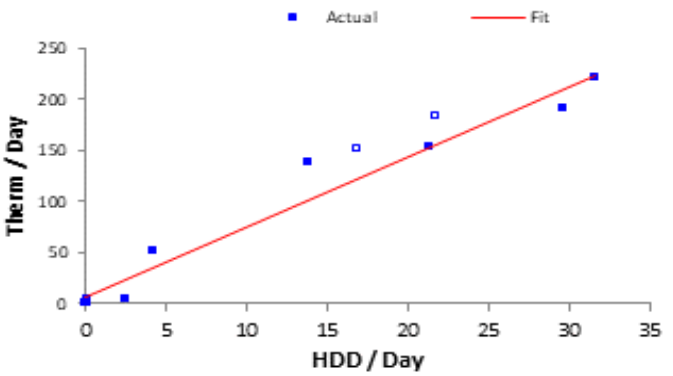


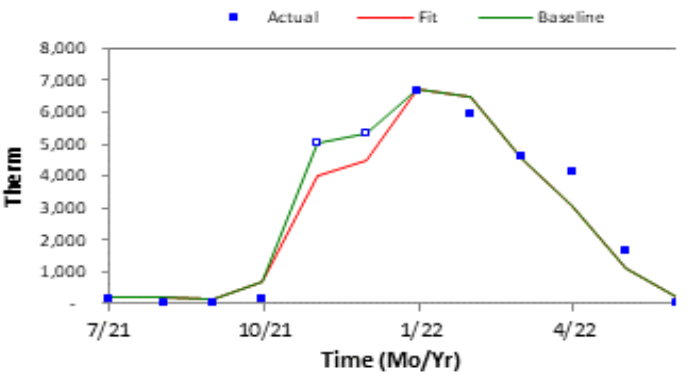
Metrix4 Utility Accounting System

Meter Tuning Contract

Project: NY Roosevelt UFSD
Area: Centennial Ave ES
Account: 4330629004

Site: NY Roosevelt UFSD
Meter: Centennial-NG-1
Unit: Therm(Qty OnPk)





From	To	# Days	Reading	Incl?	HDD	CDD	Offset	Baseline	Deviation
06/30/21	07/30/21	31	144	☒	3.0	0.0	-	198	37.3%
07/31/21	08/31/21	32	-	☒	0.0	0.0	-	183	0.0%
09/01/21	09/29/21	29	-	☒	0.0	0.0	-	166	0.0%
09/30/21	10/28/21	29	143	☒	73.0	0.0	-	667	366.6%
10/29/21	11/30/21	33	5,033	☐	555.5	0.0	1,028	5,033	0.0%
12/01/21	12/29/21	29	5,341	☐	628.5	0.0	857	5,341	0.0%
12/30/21	01/28/22	30	6,647	☒	950.5	0.0	-	6,702	0.8%
01/29/22	02/28/22	31	5,941	☒	920.5	0.0	-	6,502	9.4%
03/01/22	03/30/22	30	4,623	☒	640.0	0.0	-	4,569	-1.2%
03/31/22	04/29/22	30	4,157	☒	416.0	0.0	-	3,030	-27.1%
04/30/22	05/31/22	32	1,644	☒	133.5	0.0	-	1,100	-33.1%
06/01/22	06/29/22	29	-	☒	2.5	0.0	-	183	0.0%
Sum/Average/Max		**365**	**33,673**		**4323.0**	**0.0**	**1,885**	**33,673**	**0% +/- 21.5%**

Centennial-NG-1 (Account # 4330629004): Tuning Period is 365 days from 6/30/2021 until 6/29/2022.

Below is the equation used to calculate the Baseline values for the tuning period and all future periods:

Baseline (Therm) = 5.7125 x #Days + 6.871 x HDD + Offset

The Baseline Equation has a Net Mean Bias of 0% and a Monthly Mean Error of +/-21.5039%. The underlying regression has a R^2=0.966

Baseline Costs are calculated using Average Total Cost/Consumption.

Explanations and Assumptions:

☐ (empty checkbox) under 'Incl?' indicates that the bill is excluded from the regression. However the Baseline Equation is always applied for all billing periods, even those excluded from the regression.

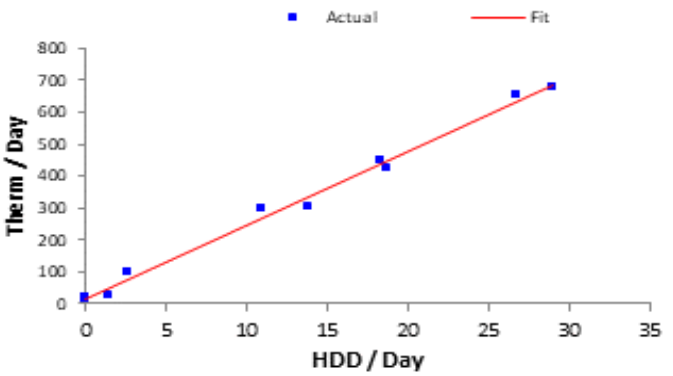
HDD = Heating Degree-Days calculated for FARMINGDALENY for a 64.0 Fº balance point.

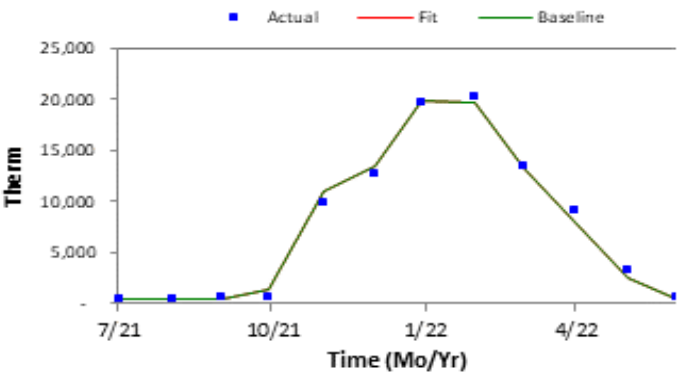
Multiplier and Offset are derived from Modification(s) in effect during the tuning period and are replicated annually for all future periods.

Meter Tuning Contract

Project: NY Roosevelt UFSD
Area: Roosevelt HS
Account: 9134266004

Site: NY Roosevelt UFSD
Meter: Roosevelt-NG-1
Unit: Therm(Qty OnPk)





From	To	# Days	Reading	Incl?	HDD	CDD	Offset	Baseline	Deviation
06/30/21	07/30/21	31	443	☒	0.0	0.0	-	509	14.9%
07/31/21	08/31/21	32	473	☒	0.0	0.0	-	525	11.0%
09/01/21	09/29/21	29	566	☒	0.0	0.0	-	476	-15.9%
09/30/21	10/28/21	29	691	☒	39.5	0.0	-	1,389	101.0%
10/29/21	11/30/21	33	9,951	☒	456.5	0.0	-	11,091	11.5%
12/01/21	12/30/21	30	12,748	☒	560.0	0.0	-	13,434	5.4%
12/31/21	01/28/22	29	19,675	☒	842.0	0.0	-	19,935	1.3%
01/29/22	02/28/22	31	20,330	☒	827.5	0.0	-	19,633	-3.4%
03/01/22	03/30/22	30	13,518	☒	550.0	0.0	-	13,203	-2.3%
03/31/22	04/29/22	30	9,033	☒	328.5	0.0	-	8,084	-10.5%
04/30/22	05/31/22	32	3,221	☒	83.5	0.0	-	2,455	-23.8%
06/01/22	06/29/22	29	561	☒	0.0	0.0	-	476	-15.2%
Sum/Average/Max		**365**	**91,210**		**3687.5**	**0.0**	**-**	**91,210**	**0% +/- 8.3%**

Roosevelt-NG-1 (Account # 9134266004): Tuning Period is 365 days from 6/30/2021 until 6/29/2022.

Below is the equation used to calculate the Baseline values for the tuning period and all future periods:

Baseline (Therm) = 16.4138 x #Days + 23.1102 x HDD

The Baseline Equation has a Net Mean Bias of 0% and a Monthly Mean Error of +/-8.3409%. The underlying regression has a R^2=0.9936

Baseline Costs are calculated using Average Total Cost/Consumption, but no less than $1.08/ Therm.

Explanations and Assumptions:

☐ (empty checkbox) under 'Incl?' indicates that the bill is excluded from the regression. However the Baseline Equation is always applied for all billing periods, even those excluded from the regression.

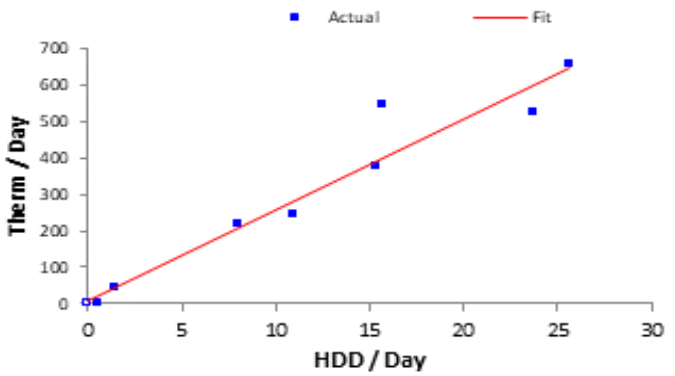
HDD = Heating Degree-Days calculated for FARMINGDALENY for a 61.0 Fº balance point.

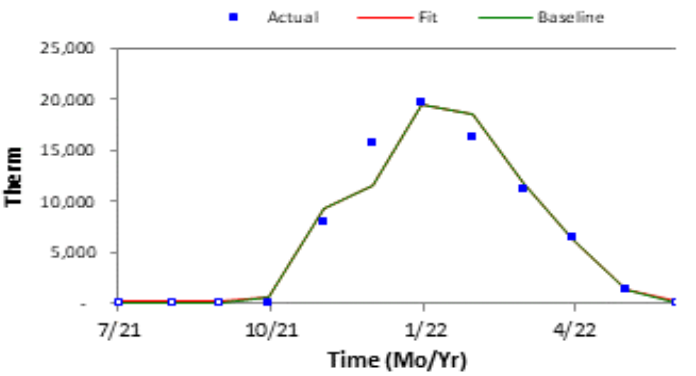
Multiplier is derived from Modification(s) in effect during the tuning period and is replicated annually for all future periods.

Meter Tuning Contract

Project: NY Roosevelt UFSD
Area: Roosevelt MS
Account: 5396235005

Site: NY Roosevelt UFSD
Meter: Roosevelt MS-NG-1
Unit: Therm(Qty OnPk)





From	To	# Days	Reading	Incl?	HDD	CDD	Offset	Baseline	Deviation
06/30/21	07/30/21	31	-	☐	0.0	0.0	(277)	-	0.0%
07/31/21	08/31/21	32	-	☐	0.0	0.0	(286)	-	0.0%
09/01/21	09/29/21	29	3	☐	0.0	0.0	(256)	3	0.0%
09/30/21	10/28/21	29	15	☒	16.5	0.0	-	670	4368.7%
10/29/21	11/30/21	33	8,072	☒	361.5	0.0	-	9,299	15.2%
12/01/21	12/29/21	29	15,797	☒	454.5	0.0	-	11,580	-26.7%
12/30/21	01/28/22	30	19,660	☒	770.5	0.0	-	19,459	-1.0%
01/29/22	02/28/22	31	16,314	☒	734.5	0.0	-	18,571	13.8%
03/01/22	03/30/22	30	11,274	☒	460.0	0.0	-	11,726	4.0%
03/31/22	04/29/22	30	6,500	☒	241.5	0.0	-	6,283	-3.3%
04/30/22	05/31/22	32	1,376	☒	45.5	0.0	-	1,419	3.2%
06/01/22	06/30/22	30	-	☐	0.0	0.0	(268)	-	0.0%
Sum/Average/Max		**366**	**79,011**		**3084.5**	**0.0**	**(1,088)**	**79,011**	**0% +/- 19.2%**

Roosevelt MS-NG-1 (Account # 5396235005): Tuning Period is 366 days from 6/30/2021 until 6/30/2022.

Below is the equation used to calculate the Baseline values for the tuning period and all future periods:

Baseline (Therm) = 8.9429 x #Days + 24.9071 x HDD + Offset

The Baseline Equation has a Net Mean Bias of 0% and a Monthly Mean Error of +/-19.1778%. The underlying regression has a R^2=0.929

Baseline Costs are calculated using Average Total Cost/Consumption.

Explanations and Assumptions:

☐ (empty checkbox) under 'Incl?' indicates that the bill is excluded from the regression. However the Baseline Equation is always applied for all billing periods, even those excluded from the regression.

HDD = Heating Degree-Days calculated for FARMINGDALENY for a 58.0 Fº balance point.

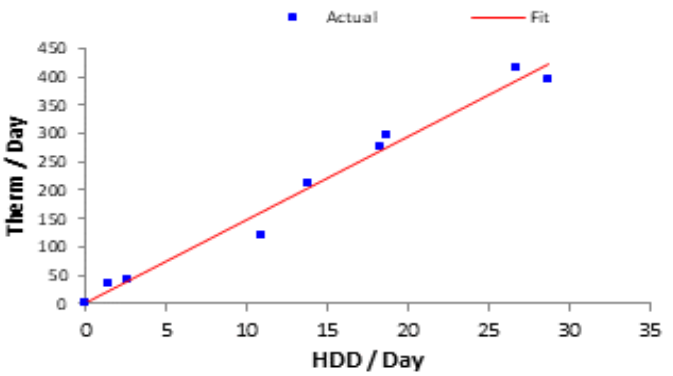
Multiplier and Offset are derived from Modification(s) in effect during the tuning period and are replicated annually for all future periods.

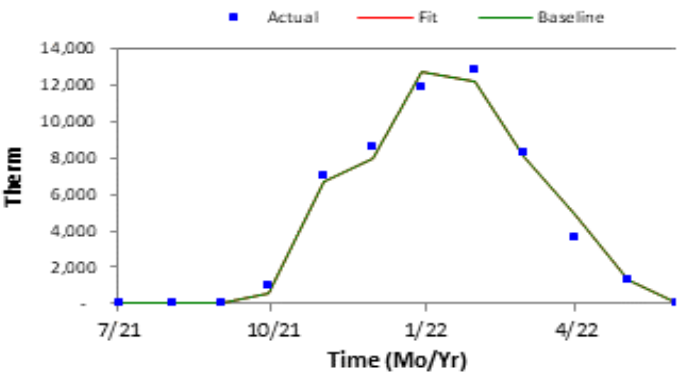
Metrix4 Utility Accounting System

Meter Tuning Contract

Project: NY Roosevelt UFSD
Area: Ulysses Pyas ES
Account: 174815000

Site: NY Roosevelt UFSD
Meter: Ulysses-NG-1
Unit: Therm(Qty OnPk)





From	To	# Days	Reading	Incl?	HDD	CDD	Offset	Baseline	Deviation
06/30/21	07/30/21	31	28	☒	0.0	0.0	-	40	41.9%
07/31/21	08/31/21	32	-	☒	0.0	0.0	-	41	0.0%
09/01/21	09/29/21	29	-	☒	0.0	0.0	-	37	0.0%
09/30/21	10/28/21	29	1,004	☒	39.5	0.0	-	617	-38.6%
10/29/21	11/30/21	33	6,960	☒	456.5	0.0	-	6,742	-3.1%
12/01/21	12/29/21	29	8,623	☒	541.5	0.0	-	7,984	-7.4%
12/30/21	01/28/22	30	11,885	☒	860.5	0.0	-	12,667	6.6%
01/29/22	02/28/22	31	12,849	☒	827.5	0.0	-	12,184	-5.2%
03/01/22	03/30/22	30	8,278	☒	550.0	0.0	-	8,110	-2.0%
03/31/22	04/29/22	30	3,600	☒	328.5	0.0	-	4,859	35.0%
04/30/22	05/31/22	32	1,358	☒	83.5	0.0	-	1,266	-6.7%
06/01/22	06/29/22	29	-	☒	0.0	0.0	-	37	0.0%
Sum/Average/Max		**365**	**54,585**		**3687.5**	**0.0**	**-**	**54,585**	**0% +/- 12%**

Ulysses-NG-1 (Account # 174815000): Tuning Period is 365 days from 6/30/2021 until 6/29/2022.

Below is the equation used to calculate the Baseline values for the tuning period and all future periods:

Baseline (Therm) = 1.2815 x #Days + 14.6759 x HDD

The Baseline Equation has a Net Mean Bias of 0% and a Monthly Mean Error of +/-12.017%. The underlying regression has a R^2=0.9873

Baseline Costs are calculated using Average Total Cost/Consumption.

Explanations and Assumptions:

☐ (empty checkbox) under 'Incl?' indicates that the bill is excluded from the regression. However the Baseline Equation is always applied for all billing periods, even those excluded from the regression.

HDD = Heating Degree-Days calculated for FARMINGDALENY for a 61.0 Fº balance point.

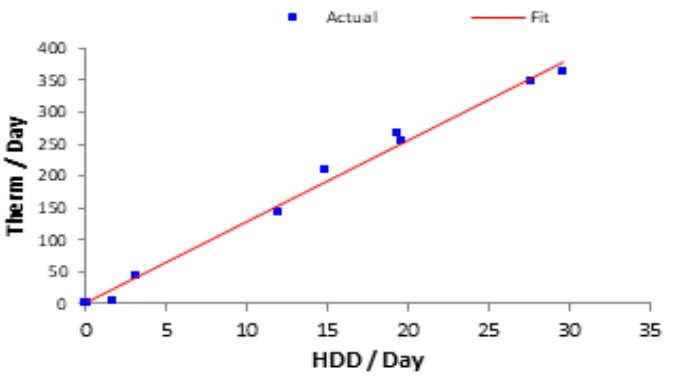
Multiplier is derived from Modification(s) in effect during the tuning period and is replicated annually for all future periods.

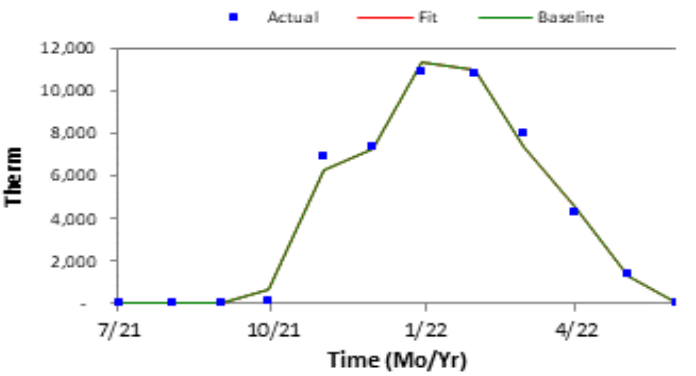
Metrix4 Utility Accounting System

Meter Tuning Contract

Project: NY Roosevelt UFSD
Area: Washington-Rose ES
Account: 5463965009

Site: NY Roosevelt UFSD
Meter: Washington-NG-1
Unit: Therm(Qty OnPk)





From	To	# Days	Reading	Incl?	HDD	CDD	Offset	Baseline	Deviation
06/30/21	07/30/21	31	-	☒	1.0	0.0	-	24	0.0%
07/31/21	08/31/21	32	-	☒	0.0	0.0	-	12	0.0%
09/01/21	09/29/21	29	5	☒	0.0	0.0	-	10	109.8%
09/30/21	10/28/21	29	108	☒	49.0	0.0	-	636	488.8%
10/29/21	11/30/21	33	6,922	☒	489.5	0.0	-	6,259	-9.6%
12/01/21	12/29/21	29	7,370	☒	570.5	0.0	-	7,292	-1.1%
12/30/21	01/28/22	30	10,896	☒	890.5	0.0	-	11,376	4.4%
01/29/22	02/28/22	31	10,801	☒	858.5	0.0	-	10,968	1.5%
03/01/22	03/30/22	30	8,003	☒	580.0	0.0	-	7,413	-7.4%
03/31/22	04/29/22	30	4,269	☒	357.5	0.0	-	4,573	7.1%
04/30/22	05/31/22	32	1,437	☒	98.5	0.0	-	1,269	-11.7%
06/01/22	06/29/22	29	31	☒	0.0	0.0	-	10	-66.2%
Sum/Average/Max		**365**	**49,842**		**3895.0**	**0.0**	**-**	**49,842**	**0% +/- 8.7%**

Washington-NG-1 (Account # 5463965009): Tuning Period is 365 days from 6/30/2021 until 6/29/2022.

Below is the equation used to calculate the Baseline values for the tuning period and all future periods:

Baseline (Therm) = 0.3617 x #Days + 12.7625 x HDD

The Baseline Equation has a Net Mean Bias of 0% and a Monthly Mean Error of +/-8.7484%. The underlying regression has a R^2=0.9934

Baseline Costs are calculated using Average Total Cost/Consumption.

Explanations and Assumptions:

☐ (empty checkbox) under 'Incl?' indicates that the bill is excluded from the regression. However the Baseline Equation is always applied for all billing periods, even those excluded from the regression.

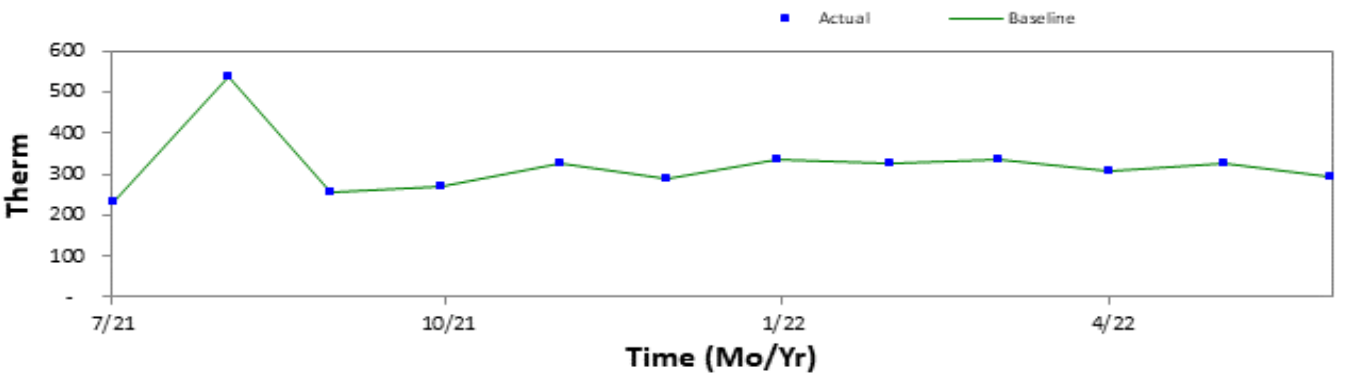
HDD = Heating Degree-Days calculated for FARMINGDALENY for a 62.0 Fº balance point.

Multiplier is derived from Modification(s) in effect during the tuning period and is replicated annually for all future periods.

Meter Tuning Contract

Project: NY Roosevelt UFSD
Area: Washington-Rose ES
Account: 4218566006

Site: NY Roosevelt UFSD
Meter: Washington-NG-2
Unit: Therm(Qty OnPk)



From	To	# Days	Reading	Incl?	HDD	CDD	Offset	Baseline	Deviation
06/30/21	07/30/21	31	231	☒	0.0	0.0	231	231	0.0%
07/31/21	08/31/21	32	536	☒	0.0	0.0	536	536	0.0%
09/01/21	09/28/21	28	255	☒	0.0	0.0	255	255	0.0%
09/29/21	10/28/21	30	268	☒	0.0	0.0	268	268	0.0%
10/29/21	11/30/21	33	327	☒	0.0	0.0	327	327	0.0%
12/01/21	12/29/21	29	290	☒	0.0	0.0	290	290	0.0%
12/30/21	01/28/22	30	337	☒	0.0	0.0	337	337	0.0%
01/29/22	02/28/22	31	326	☒	0.0	0.0	326	326	0.0%
03/01/22	03/30/22	30	334	☒	0.0	0.0	334	334	0.0%
03/31/22	04/29/22	30	305	☒	0.0	0.0	305	305	0.0%
04/30/22	05/31/22	32	325	☒	0.0	0.0	325	325	0.0%
06/01/22	06/29/22	29	292	☒	0.0	0.0	292	292	0.0%
Sum/Average/Max		**365**	**3,826**		**0.0**	**0.0**	**3,826**	**3,826**	**0.0%**

Washington-NG-2 (Account # 4218566006): Tuning Period is 365 days from 6/30/2021 until 6/29/2022.

Below is the equation used to calculate the Baseline values for the tuning period and all future periods:

Baseline (Therm) = Offset

The Baseline Equation has a Net Mean Bias of 0%. The underlying regression has a R^2=0

Baseline Costs are calculated using Average Total Cost/Consumption.

Explanations and Assumptions:

☐ (empty checkbox) under 'Incl?' indicates that the bill is excluded from the regression. However the Baseline Equation is always applied for all billing periods, even those excluded from the regression.

Multiplier and Offset are derived from Modification(s) in effect during the tuning period and are replicated annually for all future periods.

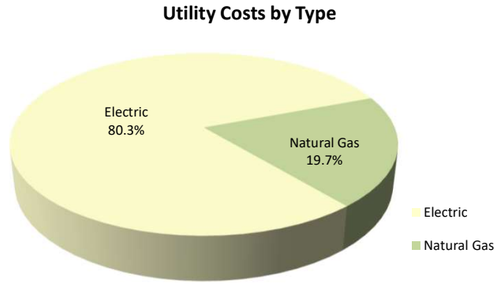
Roosevelt UFSD, NY
Exhibit D-5-Baseline
Utility Summary
July 2021 through June 2022

Building	Square Footage	Electric								Fuel Designation	Natural Gas					Total Thermal				Total Energy		
		Total Cost	Total kWh	Demand Cost	Fixed Costs	Total kW Demand	$/kW	$/kWh	$ per Square Ft	Main Heating Utility	Total Cost	Fixed Costs	Total Therms	$/Therm	$ per Square Ft	Total Cost	MMBtu/ Yr Total	$/MMBtu	$ per Square Ft	$ per Square Ft	kBTU per Square Ft	Total Cost
Centennial Avenue Elementary School	101,940	$ 229,108	1,051,200	$ 59,557	$ 13,431	3,362	$ 17.71	$ 0.149	$ 2.25	Natural Gas	$ 36,802	$ 491	33,673	$ 1.08	$ 0.36	$ 36,802	3,367	$ 10.93	$ 0.36	$ 2.61	68.2	$ 265,910
Washington-Rose Elementary School	92,000	$ 235,989	1,139,200	$ 54,943	$ 13,074	2,892	$ 19.00	$ 0.147	$ 2.57	Natural Gas	$ 71,757	$ 943	53,668	$ 1.32	$ 0.78	$ 71,757	5,367	$ 13.37	$ 0.78	$ 3.35	100.6	$ 307,745
Ulysses Byas Elementary School	93,000	$ 187,479	861,920	$ 50,242	$ 11,774	2,756	$ 18.23	$ 0.146	$ 2.02	Natural Gas	$ 70,676	$ 486	54,585	$ 1.29	$ 0.76	$ 70,676	5,459	$ 12.95	$ 0.76	$ 2.78	90.3	$ 258,155
Roosevelt Middle School	162,000	$ 486,905	2,495,040	$ 99,846	$ 20,493	5,433	$ 18.38	$ 0.147	$ 3.01	Natural Gas	$ 100,143	$ 463	79,011	$ 1.26	$ 0.62	$ 100,143	7,901	$ 12.67	$ 0.62	$ 3.62	101.3	$ 587,048
Roosevelt High School	211,500	$ 419,744	2,037,280	$ 101,393	$ 19,346	5,946	$ 17.05	$ 0.147	$ 1.98	Natural Gas	$ 102,078	$ 8,660	91,656	$ 1.02	$ 0.48	$ 102,078	9,166	$ 11.14	$ 0.48	$ 2.47	76.2	$ 521,822
TOTALS	660,440	$ 1,559,224	7,584,640	$ 365,982	$ 78,118	20,389	$ 17.95	$ 0.147	$ 2.36		$ 381,457	$ 11,042	312,593	$ 1.18	$ 0.58	$ 381,457	31,259	$ 12.20	$ 0.58	$ 2.94	86.5	$ 1,940,681

Electric	$ 1,559,224
Natural Gas	$ 381,457
Total	$ 1,940,681

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/Gallon
Wood Chips	9,200,000	BTU/Ton
Wood Pellets	15,980,000	BTU/Ton



Roosevelt UFSD, NY
Exhibit D-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	39	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	39	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**

Roosevelt UFSD, NY
Exhibit D-5-WD
Weather Data - TMY 3 Hourly Records

BMS / Occupancy Schedules

	EXISTING					PROPOSED			
	Weekday Schedule		Weekend Schedule			Weekday Schedule		Weekend Schedule	
Building	Start Time	End Time	Start Time	End Time	Summer Schedule	Start Time	End Time	Start Time	End Time
Centennial Avenue Elementary School	5:30 AM	9:30 PM				6:00 AM	4:00 PM		
Washington-Rose Elementary School	12:00 AM	12:00 AM	12:00 AM	12:00 AM		6:00 AM	4:00 PM		
Ulysses Byas Elementary School	5:30 AM	7:00 PM				6:00 AM	4:00 PM		
Roosevelt Middle School	3:00 AM	12:00 AM				6:00 AM	6:00 PM		
Roosevelt High School	6:00 AM	9:00 PM				6:00 AM	6:00 PM		

EXISTING									PROPOSED								
Weekday Schedule			Weekend Schedule			Weighted			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	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
2.5	8.0	5.5	-	-	-	0.22	0.71	0.49	2.0	8.0	-	-	-	-	0.18	0.71	-
8.0	8.0	8.0	8.0	8.0	8.0	1.00	1.00	1.00	2.0	8.0	-	-	-	-	0.18	0.71	-
2.5	8.0	3.0	-	-	-	0.22	0.71	0.27	2.0	8.0	-	-	-	-	0.18	0.71	-
5.0	8.0	8.0	-	-	-	0.45	0.71	0.71	2.0	8.0	2.0	-	-	-	0.18	0.71	0.18
2.0	8.0	5.0	-	-	-	0.18	0.71	0.45	2.0	8.0	2.0	-	-	-	0.18	0.71	0.18

NOTES:
1) All proposed HVAC run times all for a minimum of one (1) hour warm up period prior to occupant arrival
2) Existing schedules and setpoints are based on detailed review of thermostats, interviews with staff, and a review of temperature data logging results
3) Proposed schedules based on information provided by the Facilities Department
4) Guaranteed contractual savings are based on the proposed schedules and setpoints listed in this document

Roosevelt UFSD, NY
Exhibit D-5-Summary
Energy Savings Summary

Utilities	Electric kWh	Electric kW	Natural Gas Therms	Fuel Oil Gallons	Propane Gallons	Water & Sewer kGallons	$/yr
Electric	7,584,640	20,389	-	-	-	-	$ 1,559,224
Natural Gas	-	-	312,593	-	-	-	$ 381,457
Total:	**7,584,640**	**20,389**	**312,593**	**-**	**-**		**$ 1,940,681**

GLOBAL SAFETY FACTORS*

Global Electric Safety Factor [%] =	0.0%
Global Thermal Safety Factor [%] =	5.0%

*Applied over the entire project

GUARANTEED	Savings	Baseline	
Electric	**$ 913,887**	**$ 1,559,224**	**58.6%**
Natural Gas	**$ 140,052**	**$ 381,457**	**36.7%**
Total	**$ 1,053,939**	**$ 1,940,681**	**54.3%**

GUARANTEED SAVINGS

ECM No.	Description	Total Guaranteed Energy & Water Savings	% of Baseline Total Utility Cost	Guaranteed Energy & Water 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 and Lighting Controls Upgrade	$ 187,291	9.7%	848,067	11.2%	3,769.4	18.5%	$ 192,219	12.3%	(4,274)	-1.4%	$ (4,928)	-1.3%
2	Boiler Plant Upgrades	$ 40,272	2.1%	-	0.0%	-	0.0%	$ -	0.0%	15,328	4.9%	$ 40,272	10.6%
3	DHW Heater Upgrades	$ 789	0.0%	-	0.0%	-	0.0%	$ -	0.0%	698	0.2%	$ 789	0.2%
4	Mechanical Upgrades	$ 3,590	0.2%	21,733	0.3%	21.8	0.1%	$ 3,590	0.2%	-	0.0%	$ -	0.0%
5	Install De-Stratification Fans	$ 3,371	0.2%	(3,897)	-0.1%	-	0.0%	$ (573)	0.0%	3,431	1.1%	$ 3,944	1.0%
6	Building Management System Upgrades	$ 155,726	8.0%	473,613	6.2%	-	0.0%	$ 69,731	4.5%	65,866	21.1%	$ 85,995	22.5%
7	Building Envelope Improvements	$ 7,535	0.4%	8,795	0.1%	-	0.0%	$ 1,293	0.1%	5,506	1.8%	$ 6,242	1.6%
8	Pipe Insulation	$ 7,738	0.4%	-	0.0%	-	0.0%	$ -	0.0%	6,580	2.1%	$ 7,738	2.0%
9	Install Walk-In Freezer/Coolers Controllers	$ 6,796	0.4%	43,564	0.6%	22.0	0.1%	$ 6,796	0.4%	-	0.0%	$ -	0.0%
10	Install Solar PV System	$ 640,831	33.0%	4,358,407	57.5%	-	0.0%	$ 640,831	41.1%	-	0.0%	$ -	0.0%
	Total:	**$ 1,053,939**	**54.3%**	**5,750,283**	**75.8%**	**3,813.2**	**18.7%**	**$ 913,887**	**58.6%**	**93,134**	**29.8%**	**$ 140,052**	**36.7%**

Roosevelt UFSD, NY
Exhibit D-5-SIS
Savings Interaction Summary

BOILER FUEL ADJUSTMENTS DUE TO INTERACTIVE ECMS

Fuel Adjustment (Therms) - Boiler load only

Include (Y/N)	ECM #	Unadjusted Baseline	Centennial Avenue Elementary School	Washington-Rose Elementary School	Ulysses Byas Elementary School	Roosevelt Middle School	Roosevelt High School
			33,673	53,668	54,585	79,011	91,656
	-	DHW Usage (% of Building Thermal Usage)	5.0%	5.0%	5.0%	5.0%	5.0%
		DHW Baseline	1,684	2,683	2,729	3,951	4,583
		Adjusted Baseline	31,989	50,985	51,856	75,060	87,073
y	1	ECM 1 - LED Lighting and Lighting Controls Upgrade	-607	-459	-651	-925	-1,632
		Adjusted Baseline	32,596	51,444	52,507	75,986	88,705
y	3	ECM 3 - DHW Heater Upgrades	0	258	0	0	440
		Adjusted Baseline	32,596	51,186	52,507	75,986	88,265
y	4	ECM 4 - Mechanical Upgrades	0	0	0	0	0
		Adjusted Baseline	32,596	51,186	52,507	75,986	88,265
y	5	ECM 5 - Install De-Stratification Fans	429	472	398	716	1,417
		Adjusted Baseline	32,168	50,714	52,109	75,270	86,848
y	7	ECM 7 - Building Envelope Improvements	722	652	428	1,142	2,562
		Adjusted Baseline	31,445	50,063	51,681	74,128	84,286
y	8	ECM 8 - Pipe Insulation	1,726	1,221	581	1,685	1,367
		Adjusted Baseline	29,719	48,842	51,100	72,443	82,919
y	9	ECM 9 - Install Walk-In Freezer/Coolers Controllers	0	0	0	0	0
		Adjusted Baseline	29,719	48,842	51,100	72,443	82,919
y	10	ECM 10 - Install Solar PV System	0	0	0	0	0
		Adjusted Baseline	29,719	48,842	51,100	72,443	82,919
n	2	ECM 2 - Boiler Plant Upgrades	0	0	0	0	0
		Adjusted Baseline	29,719	48,842	51,100	72,443	82,919
n	6	ECM 6 - Building Management System Upgrades	0	0	0	0	0
		Adjusted Baseline	29,719	48,842	51,100	72,443	82,919

Roosevelt UFSD, NY
Exhibit D-5-1
ECM 1 - LED Lighting and Lighting Controls Upgrade

ECM DESCRIPTION

Upgrades existing lighting with state of the art, high efficiency LED lighting. Where applicable, install occupancy senors for lighting control.

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 [%]	**35%**
Average Cooling Equipment COP	**3.0**

COMMISSIONING

Confirm lighting operation and occupancy sensor functionality

RECOVERY/SAFETY FACTOR

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

FORMULAE

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

$H_{PENALTY} = (T_{EQUIVALENT} \cdot \%_{HEAT\text{-}SEASON} \cdot \%_{MAKE\text{-}UP}) / \eta_{HEATING}$
$T_{EQUIVALENT} = (L_{SAVINGS} + C_{SAVINGS}) \cdot 3{,}412 / 100{,}000$

Roosevelt UFSD, NY
Exhibit D-5-1
ECM 1 - LED Lighting and Lighting Controls 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
$\eta_{HEATING}$	%	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 [%]
Centennial Avenue Elementary School	105,536	1,664	50.49	79.0%
Washington-Rose Elementary School	99,593	1,392	41.50	89.0%
Ulysses Byas Elementary School	114,438	2,088	57.21	81.0%
Roosevelt Middle School	190,687	5,684	91.06	89.0%
Roosevelt High School	282,131	18,283	102.41	89.0%
Totals	**792,384**	**29,110**	**342.67**	

Roosevelt UFSD, NY
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CALCULATIONS

	Centennial Avenue Elementary School	Washington-Rose Elementary School	Ulysses Byas Elementary School	Roosevelt Middle School	Roosevelt High School
Lighting Derate [%]	0%	0%	0%	0%	0%
Lighting Savings [kWh]	107,200	100,985	116,526	196,370	300,413
kW Savings [kW]	50.5	41.5	57.2	91.1	102.4
Heating Season [Weeks/Year]	20	20	20	20	20
* % of Heating Season [%]	38%	38%	38%	38%	38%
**Fraction of Heat to be Made-Up [%]	40%	40%	40%	40%	40%
Equivalent of Lighting kWh Saved in Therms [Therms/Yr]	3,279	2,797	3,608	5,634	9,939
Proposed Boiler Efficiency [%]	79.0%	89.0%	81.0%	89.0%	89.0%
Heating Penalty [Therms]	(639)	(483.46)	(685)	(974)	(1,718)
Cooling Season [Weeks/Year]	16	16	16	16	16
% of Cooling Season [%]	31%	31%	31%	31%	31%
Fraction of Cooling Avoided [%]	35%	35%	35%	35%	35%
Cooling Equipment COP	3.0	3.0	3.0	3.0	3.0
Cooling Savings [kWh]	3,450	2,943	3,796	5,928	10,457

SAVINGS SUMMARY

Building ID	kWh Savings	kW Savings	Thermal Savings	Safety Factor
	kWh	kW	Therms	%
Centennial Avenue Elementary School	110,650	50.5	(639)	0.0%
Washington-Rose Elementary School	103,927	41.5	(483)	0.0%
Ulysses Byas Elementary School	120,322	57.2	(685)	0.0%
Roosevelt Middle School	202,298	91.1	(974)	0.0%
Roosevelt High School	310,870	102.4	(1,718)	0.0%
Subtotal	848,067	342.7	(4,499)	

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Lighting Line by Line

Site Name	Building Name	Index	Floor	Location	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Roosevelt Schools NY	Centennial Avenue Elementary School	1	3	Classroom 3009	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.17	0.07	0.10	190	76	114
Roosevelt Schools NY	Centennial Avenue Elementary School	2	3	Classroom 3009	10	10	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.55	0.22	0.33	634	253	380
Roosevelt Schools NY	Centennial Avenue Elementary School	3	3	Classroom 3009	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	74	32	41
Roosevelt Schools NY	Centennial Avenue Elementary School	4	3	Classroom 3008	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.17	0.07	0.10	190	76	114
Roosevelt Schools NY	Centennial Avenue Elementary School	5	3	Classroom 3008	10	10	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.55	0.22	0.33	634	253	380
Roosevelt Schools NY	Centennial Avenue Elementary School	6	3	Bathroom, Women's Rr1	5	5	0.0560	0.0170	CF PL (2) 26w	LED Retrofit Can Kit, 8 Inch, HLO	2,400	0.28	0.09	0.20	672	204	468
Roosevelt Schools NY	Centennial Avenue Elementary School	7	3	Bathroom, Women's Rr1	1	1	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XL	2,400	0.06	0.02	0.03	132	53	79
Roosevelt Schools NY	Centennial Avenue Elementary School	8	3	Bathroom, Women's Rr1	1	1	0.0450	0.0220	1x3, 2-Lamp T8	LED Int. Driver Lamps, (2) 3' Lamps, XL	2,400	0.05	0.02	0.02	108	53	55
Roosevelt Schools NY	Centennial Avenue Elementary School	9	3	Jc 1	1	1	0.0560	0.0170	CF PL (2) 26w	LED Retrofit Can Kit, 8 Inch, HLO	2,400	0.06	0.02	0.04	134	41	94
Roosevelt Schools NY	Centennial Avenue Elementary School	10	3	Bathroom, Men's Rr2	5	5	0.0560	0.0170	CF PL (2) 26w	LED Retrofit Can Kit, 8 Inch, HLO	2,400	0.28	0.09	0.20	672	204	468
Roosevelt Schools NY	Centennial Avenue Elementary School	11	3	Bathroom, Men's Rr2	1	1	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XL	2,400	0.06	0.02	0.03	132	53	79
Roosevelt Schools NY	Centennial Avenue Elementary School	12	3	Bathroom, Men's Rr2	1	1	0.0450	0.0220	1x3, 2-Lamp T8	LED Int. Driver Lamps, (2) 3' Lamps, XL	2,400	0.05	0.02	0.02	108	53	55
Roosevelt Schools NY	Centennial Avenue Elementary School	13	3	Jc 2	1	1	0.0560	0.0170	CF PL (2) 26w	LED Retrofit Can Kit, 8 Inch, HLO	2,400	0.06	0.02	0.04	134	41	94
Roosevelt Schools NY	Centennial Avenue Elementary School	14	3	Classroom 3005	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.17	0.07	0.10	190	76	114
Roosevelt Schools NY	Centennial Avenue Elementary School	15	3	Classroom 3005	10	10	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.55	0.22	0.33	634	253	380
Roosevelt Schools NY	Centennial Avenue Elementary School	16	3	Classroom 3005	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	74	32	41
Roosevelt Schools NY	Centennial Avenue Elementary School	17	3	Classroom 3004	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.17	0.07	0.10	190	76	114
Roosevelt Schools NY	Centennial Avenue Elementary School	18	3	Classroom 3004	10	10	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.55	0.22	0.33	634	253	380
Roosevelt Schools NY	Centennial Avenue Elementary School	19	3	Classroom 3004	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	74	32	41
Roosevelt Schools NY	Centennial Avenue Elementary School	20	3	Classroom 3003	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.17	0.07	0.10	190	76	114
Roosevelt Schools NY	Centennial Avenue Elementary School	21	3	Classroom 3003	10	10	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.55	0.22	0.33	634	253	380
Roosevelt Schools NY	Centennial Avenue Elementary School	22	3	Classroom 3003	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	74	32	41
Roosevelt Schools NY	Centennial Avenue Elementary School	23	3	Classroom 3002	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.17	0.07	0.10	190	76	114
Roosevelt Schools NY	Centennial Avenue Elementary School	24	3	Classroom 3002	10	10	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.55	0.22	0.33	634	253	380
Roosevelt Schools NY	Centennial Avenue Elementary School	25	3	Classroom 3002	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	74	32	41
Roosevelt Schools NY	Centennial Avenue Elementary School	26	3	Classroom 3015	2	2	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	1,152	0.14	0.07	0.07	164	81	83
Roosevelt Schools NY	Centennial Avenue Elementary School	27	3	Classroom 3015	10	10	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.55	0.22	0.33	634	253	380
Roosevelt Schools NY	Centennial Avenue Elementary School	28	3	Classroom 3015	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	74	32	41
Roosevelt Schools NY	Centennial Avenue Elementary School	29	3	Classroom 3014	2	2	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	1,152	0.14	0.07	0.07	164	81	83
Roosevelt Schools NY	Centennial Avenue Elementary School	30	3	Classroom 3014	10	10	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.55	0.22	0.33	634	253	380
Roosevelt Schools NY	Centennial Avenue Elementary School	31	3	Classroom 3014	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	74	32	41
Roosevelt Schools NY	Centennial Avenue Elementary School	32	3	Classroom 3013	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.17	0.07	0.10	190	76	114
Roosevelt Schools NY	Centennial Avenue Elementary School	33	3	Classroom 3013	10	10	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.55	0.22	0.33	634	253	380
Roosevelt Schools NY	Centennial Avenue Elementary School	34	3	Classroom 3013	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	74	32	41

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Lighting Line by Line

Site Name	Building Name	Index	Floor	Location	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Roosevelt Schools NY	Centennial Avenue Elementary School	35	3	Classroom 3012	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.17	0.07	0.10	190	76	114
Roosevelt Schools NY	Centennial Avenue Elementary School	36	3	Classroom 3012	10	10	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.55	0.22	0.33	634	253	380
Roosevelt Schools NY	Centennial Avenue Elementary School	37	3	Classroom 3012	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	74	32	41
Roosevelt Schools NY	Centennial Avenue Elementary School	38	3	Classroom 3011	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.17	0.07	0.10	190	76	114
Roosevelt Schools NY	Centennial Avenue Elementary School	39	3	Classroom 3011	10	10	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.55	0.22	0.33	634	253	380
Roosevelt Schools NY	Centennial Avenue Elementary School	40	3	Classroom 3011	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	74	32	41
Roosevelt Schools NY	Centennial Avenue Elementary School	41	3	Office 3034	2	2	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	1,152	0.14	0.07	0.07	164	81	83
Roosevelt Schools NY	Centennial Avenue Elementary School	42	3	Office 3032	7	7	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	1,152	0.50	0.25	0.25	573	282	290
Roosevelt Schools NY	Centennial Avenue Elementary School	43	3	Storage 3033	7	7	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	600	0.50	0.25	0.25	298	147	151
Roosevelt Schools NY	Centennial Avenue Elementary School	44	3	Classroom 3030	12	12	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	1,152	0.85	0.42	0.43	982	484	498
Roosevelt Schools NY	Centennial Avenue Elementary School	45	3	Classroom 3030	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.17	0.07	0.10	190	76	114
Roosevelt Schools NY	Centennial Avenue Elementary School	46	3	Classroom 3030	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	74	32	41
Roosevelt Schools NY	Centennial Avenue Elementary School	47	3	Classroom 3020	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.17	0.07	0.10	190	76	114
Roosevelt Schools NY	Centennial Avenue Elementary School	48	3	Classroom 3020	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.66	0.26	0.40	760	304	456
Roosevelt Schools NY	Centennial Avenue Elementary School	49	3	Classroom 3020	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	74	32	41
Roosevelt Schools NY	Centennial Avenue Elementary School	50	3	Bathroom 3020a	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	2,400	0.06	0.03	0.04	154	67	86
Roosevelt Schools NY	Centennial Avenue Elementary School	51	3	Classroom 3026	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.17	0.07	0.10	190	76	114
Roosevelt Schools NY	Centennial Avenue Elementary School	52	3	Classroom 3026	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.66	0.26	0.40	760	304	456
Roosevelt Schools NY	Centennial Avenue Elementary School	53	3	Classroom 3026	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	74	32	41
Roosevelt Schools NY	Centennial Avenue Elementary School	54	3	Storage 3026b	2	2	0.0560	0.0170	CF PL (2) 26w	LED Retrofit Can Kit, 8 Inch, HLO	600	0.11	0.03	0.08	67	20	47
Roosevelt Schools NY	Centennial Avenue Elementary School	55	3	Mechanical Rm 3026a	1	1	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.06	0.02	0.03	33	13	20
Roosevelt Schools NY	Centennial Avenue Elementary School	56	3	Classroom 3023	4	4	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.22	0.09	0.13	253	101	152
Roosevelt Schools NY	Centennial Avenue Elementary School	57	3	Classroom 3023	16	16	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.88	0.35	0.53	1,014	406	608
Roosevelt Schools NY	Centennial Avenue Elementary School	58	3	Classroom 3023	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	74	32	41
Roosevelt Schools NY	Centennial Avenue Elementary School	59	3	Bathroom 3023a	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	2,400	0.06	0.03	0.04	154	67	86
Roosevelt Schools NY	Centennial Avenue Elementary School	60	3	Bathroom 3021	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	2,400	0.06	0.03	0.04	154	67	86
Roosevelt Schools NY	Centennial Avenue Elementary School	61	3	Lounge 4020	10	10	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,400	0.55	0.22	0.33	1,320	528	792
Roosevelt Schools NY	Centennial Avenue Elementary School	62	3	Lounge 4020	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	2,400	0.06	0.03	0.04	154	67	86
Roosevelt Schools NY	Centennial Avenue Elementary School	63	3	Lounge 4020	2	2	0.0280	0.0160	CF PL 26w	LED Retrofit Round Kit, 5.5 Inch, NLO	2,400	0.06	0.03	0.02	134	77	58
Roosevelt Schools NY	Centennial Avenue Elementary School	64	3	Jc 3019	1	1	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.06	0.02	0.03	33	13	20
Roosevelt Schools NY	Centennial Avenue Elementary School	65	3	Telecom Rm Tl1	2	2	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.11	0.04	0.07	66	26	40
Roosevelt Schools NY	Centennial Avenue Elementary School	66	3	Electrical Rm El1	1	1	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	750	0.06	0.02	0.03	41	17	25
Roosevelt Schools NY	Centennial Avenue Elementary School	67	3	Hallway 3009 To 3002	15	15	0.0280	0.0160	CF PL 26w	LED Retrofit Round Kit, 5.5 Inch, NLO	3,000	0.42	0.24	0.18	1,260	720	540
Roosevelt Schools NY	Centennial Avenue Elementary School	68	3	Hallway 3009 To 3002	2	2	0.0280	0.0160	CF PL 26w	LED Retrofit Round Kit, 5.5 Inch, NLO	3,000	0.06	0.03	0.02	168	96	72

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Roosevelt Schools NY	Centennial Avenue Elementary School	69	3	Hallway 3009 To 3002	10	10	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	3,000	0.64	0.28	0.36	1,920	840	1,080
Roosevelt Schools NY	Centennial Avenue Elementary School	70	3	Hallway 3009 To 3002	2	2	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XL	3,000	0.11	0.04	0.07	330	132	198
Roosevelt Schools NY	Centennial Avenue Elementary School	71	3	Hallway 3009 To 3002	2	2	0.0450	0.0220	1x3, 2-Lamp T8	LED Int. Driver Lamps, (2) 3' Lamps, XL	3,000	0.09	0.04	0.05	270	132	138
Roosevelt Schools NY	Centennial Avenue Elementary School	72	3	Hallway 3009 To 3002	1	1	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,000	0.06	0.02	0.03	165	66	99
Roosevelt Schools NY	Centennial Avenue Elementary School	73	3	Hallway 3009 To 3002	3	3	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Centennial Avenue Elementary School	74	3	Hallway Jc3 To 3030	8	8	0.0280	0.0160	CF PL 26w	LED Retrofit Round Kit, 5.5 Inch, NLO	3,000	0.22	0.13	0.10	672	384	288
Roosevelt Schools NY	Centennial Avenue Elementary School	75	3	Hallway Jc3 To 3030	3	3	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	3,000	0.19	0.08	0.11	576	252	324
Roosevelt Schools NY	Centennial Avenue Elementary School	76	3	Hallway Jc3 To 3030	16	16	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XL	3,000	0.88	0.35	0.53	2,640	1,056	1,584
Roosevelt Schools NY	Centennial Avenue Elementary School	77	3	Hallway Jc3 To 3030	2	2	0.0450	0.0220	1x3, 2-Lamp T8	LED Int. Driver Lamps, (2) 3' Lamps, XL	3,000	0.09	0.04	0.05	270	132	138
Roosevelt Schools NY	Centennial Avenue Elementary School	78	3	Hallway Jc3 To 3030	2	2	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Centennial Avenue Elementary School	79	3	Hallway Jc3 To 3030 Display	10	10	0.0650	0.0110	Inc 65w	LED Lamp, R/PAR30, NLO	3,000	0.65	0.11	0.54	1,950	330	1,620
Roosevelt Schools NY	Centennial Avenue Elementary School	80	2	Classroom 2009	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.17	0.07	0.10	190	76	114
Roosevelt Schools NY	Centennial Avenue Elementary School	81	2	Classroom 2009	10	10	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.55	0.22	0.33	634	253	380
Roosevelt Schools NY	Centennial Avenue Elementary School	82	2	Classroom 2009	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	74	32	41
Roosevelt Schools NY	Centennial Avenue Elementary School	83	2	Classroom 2008	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.17	0.07	0.10	190	76	114
Roosevelt Schools NY	Centennial Avenue Elementary School	84	2	Classroom 2008	10	10	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.55	0.22	0.33	634	253	380
Roosevelt Schools NY	Centennial Avenue Elementary School	85	2	Classroom 2008	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	74	32	41
Roosevelt Schools NY	Centennial Avenue Elementary School	86	2	Bathroom, Women's Rr3	5	5	0.0560	0.0170	CF PL (2) 26w	LED Retrofit Can Kit, 8 Inch, HLO	2,400	0.28	0.09	0.20	672	204	468
Roosevelt Schools NY	Centennial Avenue Elementary School	87	2	Bathroom, Women's Rr3	1	1	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XL	2,400	0.06	0.02	0.03	132	53	79
Roosevelt Schools NY	Centennial Avenue Elementary School	88	2	Bathroom, Women's Rr3	1	1	0.0450	0.0220	1x3, 2-Lamp T8	LED Int. Driver Lamps, (2) 3' Lamps, XL	2,400	0.05	0.02	0.02	108	53	55
Roosevelt Schools NY	Centennial Avenue Elementary School	89	2	Jc 4	1	1	0.0560	0.0170	CF PL (2) 26w	LED Retrofit Can Kit, 8 Inch, HLO	2,400	0.06	0.02	0.04	134	41	94
Roosevelt Schools NY	Centennial Avenue Elementary School	90	2	Bathroom, Men's Rr4	5	5	0.0560	0.0170	CF PL (2) 26w	LED Retrofit Can Kit, 8 Inch, HLO	2,400	0.28	0.09	0.20	672	204	468
Roosevelt Schools NY	Centennial Avenue Elementary School	91	2	Bathroom, Men's Rr4	1	1	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XL	2,400	0.06	0.02	0.03	132	53	79
Roosevelt Schools NY	Centennial Avenue Elementary School	92	2	Bathroom, Men's Rr4	1	1	0.0450	0.0220	1x3, 2-Lamp T8	LED Int. Driver Lamps, (2) 3' Lamps, XL	2,400	0.05	0.02	0.02	108	53	55
Roosevelt Schools NY	Centennial Avenue Elementary School	93	2	Jc 5	1	1	0.0560	0.0170	CF PL (2) 26w	LED Retrofit Can Kit, 8 Inch, HLO	2,400	0.06	0.02	0.04	134	41	94
Roosevelt Schools NY	Centennial Avenue Elementary School	94	2	Classroom 2005	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.17	0.07	0.10	190	76	114
Roosevelt Schools NY	Centennial Avenue Elementary School	95	2	Classroom 2005	10	10	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.55	0.22	0.33	634	253	380
Roosevelt Schools NY	Centennial Avenue Elementary School	96	2	Classroom 2005	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	74	32	41
Roosevelt Schools NY	Centennial Avenue Elementary School	97	2	Classroom 2004	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.17	0.07	0.10	190	76	114
Roosevelt Schools NY	Centennial Avenue Elementary School	98	2	Classroom 2004	10	10	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.55	0.22	0.33	634	253	380
Roosevelt Schools NY	Centennial Avenue Elementary School	99	2	Classroom 2004	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	74	32	41
Roosevelt Schools NY	Centennial Avenue Elementary School	100	2	Classroom 2003	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.17	0.07	0.10	190	76	114
Roosevelt Schools NY	Centennial Avenue Elementary School	101	2	Classroom 2003	10	10	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.55	0.22	0.33	634	253	380
Roosevelt Schools NY	Centennial Avenue Elementary School	102	2	Classroom 2003	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	74	32	41

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Roosevelt Schools NY	Centennial Avenue Elementary School	103	2	Classroom 2002	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.17	0.07	0.10	190	76	114
Roosevelt Schools NY	Centennial Avenue Elementary School	104	2	Classroom 2002	10	10	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.55	0.22	0.33	634	253	380
Roosevelt Schools NY	Centennial Avenue Elementary School	105	2	Classroom 2002	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	74	32	41
Roosevelt Schools NY	Centennial Avenue Elementary School	106	2	Conference Rm 2036	6	6	0.0380	0.0145	1x4, 1-Lamp T5E	LED Int. Driver Lamp, (1) 4' T5 HE Lamp	1,000	0.23	0.09	0.14	228	87	141
Roosevelt Schools NY	Centennial Avenue Elementary School	107	2	Conference Rm 2036	3	3	0.0180	0.0095	1x2, 1-Lamp T5E	LED Int. Driver Lamp, (1) 2' T5 HE Lamp	1,000	0.05	0.03	0.03	54	29	26
Roosevelt Schools NY	Centennial Avenue Elementary School	108	2	Library 2037	4	4	0.0280	0.0160	CF PL 26w	LED Retrofit Round Kit, 5.5 Inch, NLO	1,600	0.11	0.06	0.05	179	102	77
Roosevelt Schools NY	Centennial Avenue Elementary School	109	2	Library 2037	9	9	0.0280	0.0160	CF PL 26w	LED Retrofit Round Kit, 5.5 Inch, NLO	1,600	0.25	0.14	0.11	403	230	173
Roosevelt Schools NY	Centennial Avenue Elementary School	110	2	Library 2037	15	15	0.0280	0.0160	CF PL 26w	LED Retrofit Round Kit, 5.5 Inch, NLO, HI Location	1,600	0.42	0.24	0.18	672	384	288
Roosevelt Schools NY	Centennial Avenue Elementary School	111	2	Library 2037	50	50	0.0380	0.0145	1x4, 1-Lamp T5E	LED Int. Driver Lamp, (1) 4' T5 HE Lamp	1,600	1.90	0.73	1.18	3,040	1,160	1,880
Roosevelt Schools NY	Centennial Avenue Elementary School	112	2	Library 2037	3	3	0.0180	0.0095	1x2, 1-Lamp T5E	LED Int. Driver Lamp, (1) 2' T5 HE Lamp	1,600	0.05	0.03	0.03	86	46	41
Roosevelt Schools NY	Centennial Avenue Elementary School	113	2	Library Display 2037	1	1	0.0240	0.0110	1x3, 1-Lamp T8	LED Int. Driver Lamp, (1) 3' Lamp	1,600	0.02	0.01	0.01	38	18	21
Roosevelt Schools NY	Centennial Avenue Elementary School	114	2	Library 2037	4	4	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Centennial Avenue Elementary School	115	2	Office 2041	2	2	0.0380	0.0145	1x4, 1-Lamp T5E	LED Int. Driver Lamp, (1) 4' T5 HE Lamp	1,152	0.08	0.03	0.05	88	33	54
Roosevelt Schools NY	Centennial Avenue Elementary School	116	2	Office 2040	6	6	0.0380	0.0145	1x4, 1-Lamp T5E	LED Int. Driver Lamp, (1) 4' T5 HE Lamp	1,152	0.23	0.09	0.14	263	100	162
Roosevelt Schools NY	Centennial Avenue Elementary School	117	2	Electrical Rm 2039	1	1	0.0380	0.0145	1x4, 1-Lamp T5E	LED Int. Driver Lamp, (1) 4' T5 HE Lamp	750	0.04	0.01	0.02	29	11	18
Roosevelt Schools NY	Centennial Avenue Elementary School	118	2	Bathroom 2038	5	5	0.0560	0.0170	CF PL (2) 26w	LED Retrofit Can Kit, 8 Inch, HLO	2,400	0.28	0.09	0.20	672	204	468
Roosevelt Schools NY	Centennial Avenue Elementary School	119	2	Classroom 2015	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.17	0.07	0.10	190	76	114
Roosevelt Schools NY	Centennial Avenue Elementary School	120	2	Classroom 2015	10	10	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.55	0.22	0.33	634	253	380
Roosevelt Schools NY	Centennial Avenue Elementary School	121	2	Classroom 2015	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	74	32	41
Roosevelt Schools NY	Centennial Avenue Elementary School	122	2	Classroom 2014	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.17	0.07	0.10	190	76	114
Roosevelt Schools NY	Centennial Avenue Elementary School	123	2	Classroom 2014	10	10	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.55	0.22	0.33	634	253	380
Roosevelt Schools NY	Centennial Avenue Elementary School	124	2	Classroom 2014	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	74	32	41
Roosevelt Schools NY	Centennial Avenue Elementary School	125	2	Classroom 2013	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.17	0.07	0.10	190	76	114
Roosevelt Schools NY	Centennial Avenue Elementary School	126	2	Classroom 2013	10	10	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.55	0.22	0.33	634	253	380
Roosevelt Schools NY	Centennial Avenue Elementary School	127	2	Classroom 2013	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	74	32	41
Roosevelt Schools NY	Centennial Avenue Elementary School	128	2	Classroom 2012	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.17	0.07	0.10	190	76	114
Roosevelt Schools NY	Centennial Avenue Elementary School	129	2	Classroom 2012	10	10	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.55	0.22	0.33	634	253	380
Roosevelt Schools NY	Centennial Avenue Elementary School	130	2	Classroom 2012	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	74	32	41
Roosevelt Schools NY	Centennial Avenue Elementary School	131	2	Classroom 2011	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.17	0.07	0.10	190	76	114
Roosevelt Schools NY	Centennial Avenue Elementary School	132	2	Classroom 2011	10	10	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.55	0.22	0.33	634	253	380
Roosevelt Schools NY	Centennial Avenue Elementary School	133	2	Classroom 2011	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	74	32	41
Roosevelt Schools NY	Centennial Avenue Elementary School	134	2	Office 2034	2	2	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	1,152	0.14	0.07	0.07	164	81	83
Roosevelt Schools NY	Centennial Avenue Elementary School	135	2	Office 2033	7	7	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	1,152	0.50	0.25	0.25	573	282	290
Roosevelt Schools NY	Centennial Avenue Elementary School	136	2	Copy Room	2	2	0.0320	0.0160	2x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	1,152	0.06	0.03	0.03	74	37	37

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Roosevelt Schools NY	Centennial Avenue Elementary School	137	2	Classroom 2030	12	12	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	1,152	0.85	0.42	0.43	982	484	498
Roosevelt Schools NY	Centennial Avenue Elementary School	138	2	Classroom 2030	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.17	0.07	0.10	190	76	114
Roosevelt Schools NY	Centennial Avenue Elementary School	139	2	Classroom 2030	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	74	32	41
Roosevelt Schools NY	Centennial Avenue Elementary School	140	2	Classroom 2028	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.17	0.07	0.10	190	76	114
Roosevelt Schools NY	Centennial Avenue Elementary School	141	2	Classroom 2028	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.66	0.26	0.40	760	304	456
Roosevelt Schools NY	Centennial Avenue Elementary School	142	2	Classroom 2028	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	74	32	41
Roosevelt Schools NY	Centennial Avenue Elementary School	143	2	Bathroom 2028a	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	2,400	0.06	0.03	0.04	154	67	86
Roosevelt Schools NY	Centennial Avenue Elementary School	144	2	Classroom 2026	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.17	0.07	0.10	190	76	114
Roosevelt Schools NY	Centennial Avenue Elementary School	145	2	Classroom 2026	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.66	0.26	0.40	760	304	456
Roosevelt Schools NY	Centennial Avenue Elementary School	146	2	Classroom 2026	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	74	32	41
Roosevelt Schools NY	Centennial Avenue Elementary School	147	2	Storage 2026a	2	2	0.0560	0.0170	CF PL (2) 26w	LED Retrofit Can Kit, 8 Inch, HLO	600	0.11	0.03	0.08	67	20	47
Roosevelt Schools NY	Centennial Avenue Elementary School	148	2	Jc 2025	1	1	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.06	0.02	0.03	33	13	20
Roosevelt Schools NY	Centennial Avenue Elementary School	149	2	Classroom 2023	16	16	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.88	0.35	0.53	1,014	406	608
Roosevelt Schools NY	Centennial Avenue Elementary School	150	2	Classroom 2023	4	4	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.22	0.09	0.13	253	101	152
Roosevelt Schools NY	Centennial Avenue Elementary School	151	2	Classroom 2023	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	74	32	41
Roosevelt Schools NY	Centennial Avenue Elementary School	152	2	Bathroom 2023a	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	2,400	0.06	0.03	0.04	154	67	86
Roosevelt Schools NY	Centennial Avenue Elementary School	153	2	Bathroom 2023b	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	2,400	0.06	0.03	0.04	154	67	86
Roosevelt Schools NY	Centennial Avenue Elementary School	154	2	Classroom 2020	10	10	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.55	0.22	0.33	634	253	380
Roosevelt Schools NY	Centennial Avenue Elementary School	155	2	Classroom 2020	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	74	32	41
Roosevelt Schools NY	Centennial Avenue Elementary School	156	2	Classroom 2020	2	2	0.0280	0.0160	CF PL 26w	LED Retrofit Round Kit, 5.5 Inch, NLO	1,152	0.06	0.03	0.02	65	37	28
Roosevelt Schools NY	Centennial Avenue Elementary School	157	2	Jc 2019	1	1	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.06	0.02	0.03	33	13	20
Roosevelt Schools NY	Centennial Avenue Elementary School	158	2	Telecom Rm 2001	2	2	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.11	0.04	0.07	66	26	40
Roosevelt Schools NY	Centennial Avenue Elementary School	159	2	Electrical Rm El2	1	1	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	750	0.06	0.02	0.03	41	17	25
Roosevelt Schools NY	Centennial Avenue Elementary School	160	2	Hallway 2009 To 2002	15	15	0.0280	0.0160	CF PL 26w	LED Retrofit Round Kit, 5.5 Inch, NLO	3,000	0.42	0.24	0.18	1,260	720	540
Roosevelt Schools NY	Centennial Avenue Elementary School	161	2	Hallway 2009 To 2002	2	2	0.0280	0.0160	CF PL 26w	LED Retrofit Round Kit, 5.5 Inch, NLO	3,000	0.06	0.03	0.02	168	96	72
Roosevelt Schools NY	Centennial Avenue Elementary School	162	2	Hallway 2009 To 2002	11	11	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	3,000	0.70	0.31	0.40	2,112	924	1,188
Roosevelt Schools NY	Centennial Avenue Elementary School	163	2	Hallway 2009 To 2002	2	2	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XL	3,000	0.11	0.04	0.07	330	132	198
Roosevelt Schools NY	Centennial Avenue Elementary School	164	2	Hallway 2009 To 2002	2	2	0.0450	0.0220	1x3, 2-Lamp T8	LED Int. Driver Lamps, (2) 3' Lamps, XL	3,000	0.09	0.04	0.05	270	132	138
Roosevelt Schools NY	Centennial Avenue Elementary School	165	2	Hallway 2009 To 2002	3	3	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Centennial Avenue Elementary School	166	2	Hallway 2019 To 2030	9	9	0.0280	0.0160	CF PL 26w	LED Retrofit Round Kit, 5.5 Inch, NLO	3,000	0.25	0.14	0.11	756	432	324
Roosevelt Schools NY	Centennial Avenue Elementary School	167	2	Hallway 2019 To 2030	3	3	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	3,000	0.19	0.08	0.11	576	252	324
Roosevelt Schools NY	Centennial Avenue Elementary School	168	2	Hallway 2019 To 2030	16	16	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XL	3,000	0.88	0.35	0.53	2,640	1,056	1,584
Roosevelt Schools NY	Centennial Avenue Elementary School	169	2	Hallway 2019 To 2030	2	2	0.0450	0.0220	1x3, 2-Lamp T8	LED Int. Driver Lamps, (2) 3' Lamps, XL	3,000	0.09	0.04	0.05	270	132	138
Roosevelt Schools NY	Centennial Avenue Elementary School	170	2	Hallway 2019 To 2030	2	2	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-

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Roosevelt Schools NY	Centennial Avenue Elementary School	171	2	Hallway 2019 To 2030 Display	10	10	0.0650	0.0110	Inc 65w	LED Lamp, R/PAR30, NLO	3,000	0.65	0.11	0.54	1,950	330	1,620
Roosevelt Schools NY	Centennial Avenue Elementary School	172	2	Hallway By Library	13	13	0.0380	0.0145	1x4, 1-Lamp T5E	LED Int. Driver Lamp, (1) 4' T5 HE Lamp	3,000	0.49	0.19	0.31	1,482	566	917
Roosevelt Schools NY	Centennial Avenue Elementary School	173	2	Hallway By Library	2	2	0.0180	0.0095	1x2, 1-Lamp T5E	LED Int. Driver Lamp, (1) 2' T5 HE Lamp	3,000	0.04	0.02	0.02	108	57	51
Roosevelt Schools NY	Centennial Avenue Elementary School	174	2	Hallway By Library	1	1	0.0280	0.0160	CF PL 26w	LED Retrofit Round Kit, 5.5 Inch, NLO	3,000	0.03	0.02	0.01	84	48	36
Roosevelt Schools NY	Centennial Avenue Elementary School	175	2	Hallway By Library	2	2	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Centennial Avenue Elementary School	176	1	Classroom 1023	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.17	0.07	0.10	190	76	114
Roosevelt Schools NY	Centennial Avenue Elementary School	177	1	Classroom 1023	10	10	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.55	0.22	0.33	634	253	380
Roosevelt Schools NY	Centennial Avenue Elementary School	178	1	Classroom 1023	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	74	32	41
Roosevelt Schools NY	Centennial Avenue Elementary School	179	1	Bathroom 1023a	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	2,400	0.06	0.03	0.04	154	67	86
Roosevelt Schools NY	Centennial Avenue Elementary School	180	1	Classroom 1021	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.17	0.07	0.10	190	76	114
Roosevelt Schools NY	Centennial Avenue Elementary School	181	1	Classroom 1021	10	10	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.55	0.22	0.33	634	253	380
Roosevelt Schools NY	Centennial Avenue Elementary School	182	1	Classroom 1021	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	74	32	41
Roosevelt Schools NY	Centennial Avenue Elementary School	183	1	Jc 1020	1	1	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.06	0.02	0.03	33	13	20
Roosevelt Schools NY	Centennial Avenue Elementary School	184	1	Office 1015	10	10	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	1,152	0.71	0.35	0.36	818	403	415
Roosevelt Schools NY	Centennial Avenue Elementary School	185	1	Nurse 1008	2	2	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	1,440	0.14	0.07	0.07	204	101	104
Roosevelt Schools NY	Centennial Avenue Elementary School	186	1	Nurse 1008	2	2	0.0280	0.0160	CF PL 26w	LED Retrofit Round Kit, 5.5 Inch, NLO	1,440	0.06	0.03	0.02	81	46	35
Roosevelt Schools NY	Centennial Avenue Elementary School	187	1	Nurse 1008	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,440	0.17	0.07	0.10	238	95	143
Roosevelt Schools NY	Centennial Avenue Elementary School	188	1	Nurse 1013	2	2	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	1,152	0.14	0.07	0.07	164	81	83
Roosevelt Schools NY	Centennial Avenue Elementary School	189	1	Nurse 1012	2	2	0.0320	0.0160	2x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	1,152	0.06	0.03	0.03	74	37	37
Roosevelt Schools NY	Centennial Avenue Elementary School	190	1	Nurse 1011	2	2	0.0320	0.0160	2x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	1,152	0.06	0.03	0.03	74	37	37
Roosevelt Schools NY	Centennial Avenue Elementary School	191	1	Bathroom 1008a	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	2,400	0.06	0.03	0.04	154	67	86
Roosevelt Schools NY	Centennial Avenue Elementary School	192	1	Classroom 1007	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.17	0.07	0.10	190	76	114
Roosevelt Schools NY	Centennial Avenue Elementary School	193	1	Classroom 1007	10	10	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.55	0.22	0.33	634	253	380
Roosevelt Schools NY	Centennial Avenue Elementary School	194	1	Classroom 1007	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	74	32	41
Roosevelt Schools NY	Centennial Avenue Elementary School	195	1	Classroom 1006	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.17	0.07	0.10	190	76	114
Roosevelt Schools NY	Centennial Avenue Elementary School	196	1	Classroom 1006	10	10	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.55	0.22	0.33	634	253	380
Roosevelt Schools NY	Centennial Avenue Elementary School	197	1	Classroom 1006	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	74	32	41
Roosevelt Schools NY	Centennial Avenue Elementary School	198	1	Classroom 1004	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.17	0.07	0.10	190	76	114
Roosevelt Schools NY	Centennial Avenue Elementary School	199	1	Classroom 1004	10	10	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.55	0.22	0.33	634	253	380
Roosevelt Schools NY	Centennial Avenue Elementary School	200	1	Classroom 1004	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	74	32	41
Roosevelt Schools NY	Centennial Avenue Elementary School	201	1	Main Office 1038	13	13	0.0720	0.0210	CF PL (2) 32w	LED Retrofit Can Kit, 10 Inch, NLO	2,200	0.94	0.27	0.66	2,059	601	1,459
Roosevelt Schools NY	Centennial Avenue Elementary School	202	1	Main Office 1038	3	3	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	1,152	0.21	0.11	0.11	245	121	124
Roosevelt Schools NY	Centennial Avenue Elementary School	203	1	Main Office 1038	3	3	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Centennial Avenue Elementary School	204	1	Office 1037	4	4	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	1,760	0.28	0.14	0.14	500	246	253

Roosevelt UFSD, NY
Exhibit D-5-1
ECM 1 - LED Lighting and Lighting Controls Upgrade
Lighting Line by Line

Site Name	Building Name	Index	Floor	Location	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Roosevelt Schools NY	Centennial Avenue Elementary School	205	1	Office 1036	4	4	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	1,760	0.28	0.14	0.14	500	246	253
Roosevelt Schools NY	Centennial Avenue Elementary School	206	1	Office 1035	2	2	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	1,760	0.14	0.07	0.07	250	123	127
Roosevelt Schools NY	Centennial Avenue Elementary School	207	1	Office 1034	4	4	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	1,760	0.28	0.14	0.14	500	246	253
Roosevelt Schools NY	Centennial Avenue Elementary School	208	1	Office 1033	4	4	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	1,760	0.28	0.14	0.14	500	246	253
Roosevelt Schools NY	Centennial Avenue Elementary School	209	1	Copy Room 1031	4	4	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	2,000	0.28	0.14	0.14	568	280	288
Roosevelt Schools NY	Centennial Avenue Elementary School	210	1	Bathroom 1032	1	1	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	2,400	0.07	0.04	0.04	170	84	86
Roosevelt Schools NY	Centennial Avenue Elementary School	211	1	Bathroom 1040	1	1	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	2,400	0.07	0.04	0.04	170	84	86
Roosevelt Schools NY	Centennial Avenue Elementary School	212	1	Classroom 1030	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.17	0.07	0.10	190	76	114
Roosevelt Schools NY	Centennial Avenue Elementary School	213	1	Classroom 1030	10	10	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.55	0.22	0.33	634	253	380
Roosevelt Schools NY	Centennial Avenue Elementary School	214	1	Classroom 1030	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	74	32	41
Roosevelt Schools NY	Centennial Avenue Elementary School	215	1	Classroom 1028	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.17	0.07	0.10	190	76	114
Roosevelt Schools NY	Centennial Avenue Elementary School	216	1	Classroom 1028	10	10	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.55	0.22	0.33	634	253	380
Roosevelt Schools NY	Centennial Avenue Elementary School	217	1	Classroom 1028	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	74	32	41
Roosevelt Schools NY	Centennial Avenue Elementary School	218	1	Classroom 1026	2	2	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.11	0.04	0.07	127	51	76
Roosevelt Schools NY	Centennial Avenue Elementary School	219	1	Classroom 1026	10	10	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.55	0.22	0.33	634	253	380
Roosevelt Schools NY	Centennial Avenue Elementary School	220	1	Classroom 1026	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	74	32	41
Roosevelt Schools NY	Centennial Avenue Elementary School	221	1	Office 1034	2	2	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	1,152	0.14	0.07	0.07	164	81	83
Roosevelt Schools NY	Centennial Avenue Elementary School	222	1	Classroom 1056	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.17	0.07	0.10	190	76	114
Roosevelt Schools NY	Centennial Avenue Elementary School	223	1	Classroom 1056	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.66	0.26	0.40	760	304	456
Roosevelt Schools NY	Centennial Avenue Elementary School	224	1	Classroom 1056	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	74	32	41
Roosevelt Schools NY	Centennial Avenue Elementary School	225	1	Bathroom 1056a	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	2,400	0.06	0.03	0.04	154	67	86
Roosevelt Schools NY	Centennial Avenue Elementary School	226	1	Classroom 1054	4	4	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.22	0.09	0.13	253	101	152
Roosevelt Schools NY	Centennial Avenue Elementary School	227	1	Classroom 1054	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.66	0.26	0.40	760	304	456
Roosevelt Schools NY	Centennial Avenue Elementary School	228	1	Classroom 1054	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	74	32	41
Roosevelt Schools NY	Centennial Avenue Elementary School	229	1	Classroom 1052	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.17	0.07	0.10	190	76	114
Roosevelt Schools NY	Centennial Avenue Elementary School	230	1	Classroom 1052	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.66	0.26	0.40	760	304	456
Roosevelt Schools NY	Centennial Avenue Elementary School	231	1	Classroom 1052	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	74	32	41
Roosevelt Schools NY	Centennial Avenue Elementary School	232	1	Bathroom 1052a	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	2,400	0.06	0.03	0.04	154	67	86
Roosevelt Schools NY	Centennial Avenue Elementary School	233	1	Classroom 1050	4	4	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.22	0.09	0.13	253	101	152
Roosevelt Schools NY	Centennial Avenue Elementary School	234	1	Classroom 1050	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.66	0.26	0.40	760	304	456
Roosevelt Schools NY	Centennial Avenue Elementary School	235	1	Classroom 1050	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	74	32	41
Roosevelt Schools NY	Centennial Avenue Elementary School	236	1	Bathroom 1050a	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	2,400	0.06	0.03	0.04	154	67	86
Roosevelt Schools NY	Centennial Avenue Elementary School	237	1	Classroom 1048	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.17	0.07	0.10	190	76	114
Roosevelt Schools NY	Centennial Avenue Elementary School	238	1	Classroom 1048	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.66	0.26	0.40	760	304	456

Roosevelt UFSD, NY
Exhibit D-5-1
ECM 1 - LED Lighting and Lighting Controls Upgrade
Lighting Line by Line

Site Name	Building Name	Index	Floor	Location	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Roosevelt Schools NY	Centennial Avenue Elementary School	239	1	Classroom 1048	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	74	32	41
Roosevelt Schools NY	Centennial Avenue Elementary School	240	1	Jc 1048a	1	1	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.06	0.02	0.03	33	13	20
Roosevelt Schools NY	Centennial Avenue Elementary School	241	1	Lounge 1046	3	3	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	1,440	0.21	0.11	0.11	307	151	156
Roosevelt Schools NY	Centennial Avenue Elementary School	242	1	Lounge 1046	6	6	0.0280	0.0110	1x4, 1-Lamp T8	LED Int. Driver Lamp, (1) 4' Lamp, XL	1,440	0.17	0.07	0.10	242	95	147
Roosevelt Schools NY	Centennial Avenue Elementary School	243	1	Classroom 1045	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.66	0.26	0.40	760	304	456
Roosevelt Schools NY	Centennial Avenue Elementary School	244	1	Classroom 1045	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	74	32	41
Roosevelt Schools NY	Centennial Avenue Elementary School	245	1	Bathroom 1045a	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	2,400	0.06	0.03	0.04	154	67	86
Roosevelt Schools NY	Centennial Avenue Elementary School	246	1	Classroom 1042	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.17	0.07	0.10	190	76	114
Roosevelt Schools NY	Centennial Avenue Elementary School	247	1	Classroom 1042	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.66	0.26	0.40	760	304	456
Roosevelt Schools NY	Centennial Avenue Elementary School	248	1	Classroom 1042	1	1	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	74	32	41
Roosevelt Schools NY	Centennial Avenue Elementary School	249	1	Telecom Rm 1045a	2	2	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.11	0.04	0.07	66	26	40
Roosevelt Schools NY	Centennial Avenue Elementary School	250	1	Electrical Rm El3	1	1	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	750	0.06	0.02	0.03	41	17	25
Roosevelt Schools NY	Centennial Avenue Elementary School	251	1	Hallway 1023 To 1004	14	14	0.0280	0.0160	CF PL 26w	LED Retrofit Round Kit, 5.5 Inch, NLO	3,000	0.39	0.22	0.17	1,176	672	504
Roosevelt Schools NY	Centennial Avenue Elementary School	252	1	Hallway 1023 To 1004	1	1	0.0280	0.0160	CF PL 26w	LED Retrofit Round Kit, 5.5 Inch, NLO	3,000	0.03	0.02	0.01	84	48	36
Roosevelt Schools NY	Centennial Avenue Elementary School	253	1	Hallway 1023 To 1004	8	8	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	3,000	0.51	0.22	0.29	1,536	672	864
Roosevelt Schools NY	Centennial Avenue Elementary School	254	1	Hallway 1023 To 1004	2	2	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XL	3,000	0.11	0.04	0.07	330	132	198
Roosevelt Schools NY	Centennial Avenue Elementary School	255	1	Hallway 1023 To 1004	2	2	0.0450	0.0220	1x3, 2-Lamp T8	LED Int. Driver Lamps, (2) 3' Lamps, XL	3,000	0.09	0.04	0.05	270	132	138
Roosevelt Schools NY	Centennial Avenue Elementary School	256	1	Hallway 1023 To 1004	3	3	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Centennial Avenue Elementary School	257	1	Hallway 1045 To 1052	9	9	0.0280	0.0160	CF PL 26w	LED Retrofit Round Kit, 5.5 Inch, NLO	3,000	0.25	0.14	0.11	756	432	324
Roosevelt Schools NY	Centennial Avenue Elementary School	258	1	Hallway 1045 To 1052	5	5	0.0640	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	3,000	0.32	0.14	0.18	960	420	540
Roosevelt Schools NY	Centennial Avenue Elementary School	259	1	Hallway 1045 To 1052	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XL	3,000	0.66	0.26	0.40	1,980	792	1,188
Roosevelt Schools NY	Centennial Avenue Elementary School	260	1	Hallway 1045 To 1052	2	2	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Centennial Avenue Elementary School	261	1	Hallway 1045 To 1052 Display	8	8	0.0650	0.0110	Inc 65w	LED Lamp, R/PAR30, NLO	3,000	0.52	0.09	0.43	1,560	264	1,296
Roosevelt Schools NY	Centennial Avenue Elementary School	262	1	Lobby L1	10	10	0.0560	0.0170	CF PL (2) 26w	LED Retrofit Can Kit, 8 Inch, HLO	2,400	0.56	0.17	0.39	1,344	408	936
Roosevelt Schools NY	Centennial Avenue Elementary School	263	1	Lobby L2	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XL	2,400	0.66	0.26	0.40	1,584	634	950
Roosevelt Schools NY	Centennial Avenue Elementary School	264	1	Lobby L2	6	6	0.0450	0.0220	1x3, 2-Lamp T8	LED Int. Driver Lamps, (2) 3' Lamps, XL	2,400	0.27	0.13	0.14	648	317	331
Roosevelt Schools NY	Centennial Avenue Elementary School	265	1	Lobby L2	6	6	0.0280	0.0160	CF PL 26w	LED Retrofit Round Kit, 5.5 Inch, NLO	2,400	0.17	0.10	0.07	403	230	173
Roosevelt Schools NY	Centennial Avenue Elementary School	266	1	Lobby L2	18	18	0.0380	0.0145	1x4, 1-Lamp T5E	LED Int. Driver Lamp, (1) 4' T5 HE Lamp	2,400	0.68	0.26	0.42	1,642	626	1,015
Roosevelt Schools NY	Centennial Avenue Elementary School	267	1	Lobby L2	6	6	0.0180	0.0095	1x2, 1-Lamp T5E	LED Int. Driver Lamp, (1) 2' T5 HE Lamp	3,000	0.11	0.06	0.05	324	171	153
Roosevelt Schools NY	Centennial Avenue Elementary School	268	1	Lobby L2	4	4	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Centennial Avenue Elementary School	269	1	Cafeteria 1064	30	30	0.0280	0.0160	CF PL 26w	LED Retrofit Round Kit, 5.5 Inch, NLO	5,725	0.84	0.48	0.36	4,809	2,748	2,061
Roosevelt Schools NY	Centennial Avenue Elementary School	270	1	Cafeteria 1064	62	62	0.0380	0.0145	1x4, 1-Lamp T5E	LED Int. Driver Lamp, (1) 4' T5 HE Lamp	5,725	2.36	0.90	1.46	13,488	5,147	8,341
Roosevelt Schools NY	Centennial Avenue Elementary School	271	1	Cafeteria 1064	6	6	0.0180	0.0095	1x2, 1-Lamp T5E	LED Int. Driver Lamp, (1) 2' T5 HE Lamp	5,725	0.11	0.06	0.05	618	326	292
Roosevelt Schools NY	Centennial Avenue Elementary School	272	1	Cafeteria 1064	3	3	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-

Roosevelt UFSD, NY
Exhibit D-5-1
ECM 1 - LED Lighting and Lighting Controls Upgrade
Lighting Line by Line

Site Name	Building Name	Index	Floor	Location	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Roosevelt Schools NY	Centennial Avenue Elementary School	273	1	Jc 1065	2	2	0.0550	0.0210	2x2, 2-Lamp U T8	LED Int. Driver Lamps, (3) 2' Lamps, 2x2 Kit	600	0.11	0.04	0.07	66	25	41
Roosevelt Schools NY	Centennial Avenue Elementary School	274	1	Faculty Dining 1064	20	20	0.0280	0.0160	CF PL 26w	LED Retrofit Round Kit, 5.5 Inch, NLO	5,725	0.56	0.32	0.24	3,206	1,832	1,374
Roosevelt Schools NY	Centennial Avenue Elementary School	275	1	Faculty Dining 1064	2	2	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Centennial Avenue Elementary School	276	1	Serving Line 1067	8	8	0.0550	0.0210	2x2, 2-Lamp U T8	LED Int. Driver Lamps, (3) 2' Lamps, 2x2 Kit	864	0.44	0.17	0.27	380	145	235
Roosevelt Schools NY	Centennial Avenue Elementary School	277	1	Serving Line 1067	1	1	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Centennial Avenue Elementary School	278	1	Kitchen 1068	11	11	0.0550	0.0210	2x2, 2-Lamp U T8	LED Int. Driver Lamps, (3) 2' Lamps, 2x2 Kit	864	0.61	0.23	0.37	523	200	323
Roosevelt Schools NY	Centennial Avenue Elementary School	279	1	Kitchen Hoods 1068	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	5,725	0.17	0.07	0.10	945	378	567
Roosevelt Schools NY	Centennial Avenue Elementary School	280	1	Kitchen 1068	4	4	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Centennial Avenue Elementary School	281	1	Cooler 1069	6	6	0.0700	0.0220	1x4, 2-Lamp T12	LED Int. Driver Lamps, (2) 4' Lamps, XL	750	0.42	0.13	0.29	315	99	216
Roosevelt Schools NY	Centennial Avenue Elementary School	282	1	Storage 1070	4	4	0.0550	0.0210	2x2, 2-Lamp U T8	LED Int. Driver Lamps, (3) 2' Lamps, 2x2 Kit	750	0.22	0.08	0.14	165	63	102
Roosevelt Schools NY	Centennial Avenue Elementary School	283	1	Office 1071	2	2	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	864	0.14	0.07	0.07	123	60	62
Roosevelt Schools NY	Centennial Avenue Elementary School	284	1	Telecom Rm 1072	2	2	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.11	0.04	0.07	66	26	40
Roosevelt Schools NY	Centennial Avenue Elementary School	285	1	Office 1073	2	2	0.0550	0.0210	2x2, 2-Lamp U T8	LED Int. Driver Lamps, (3) 2' Lamps, 2x2 Kit	3,200	0.11	0.04	0.07	352	134	218
Roosevelt Schools NY	Centennial Avenue Elementary School	286	1	Storage 1073a	1	1	0.0170	0.0080	1x2, 1-Lamp T8	LED Int. Driver Lamp, (1) 2' Lamp	750	0.02	0.01	0.01	13	6	7
Roosevelt Schools NY	Centennial Avenue Elementary School	287	1	Bathroom, Women's 1074	5	5	0.0280	0.0090	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	2,400	0.14	0.05	0.10	336	108	228
Roosevelt Schools NY	Centennial Avenue Elementary School	288	1	Bathroom, Men's 1075	5	5	0.0280	0.0090	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	1,760	0.14	0.05	0.10	246	79	167
Roosevelt Schools NY	Centennial Avenue Elementary School	289	1	Staff Lockers Women's 1075	4	4	0.0280	0.0090	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	2,400	0.11	0.04	0.08	269	86	182
Roosevelt Schools NY	Centennial Avenue Elementary School	290	1	Staff Bathroom Women's 1076	4	4	0.0280	0.0090	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	2,400	0.11	0.04	0.08	269	86	182
Roosevelt Schools NY	Centennial Avenue Elementary School	291	1	Staff Lockers Men's 1078	4	4	0.0280	0.0090	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	2,400	0.11	0.04	0.08	269	86	182
Roosevelt Schools NY	Centennial Avenue Elementary School	292	1	Staff Bathroom Men's 1079	4	4	0.0280	0.0090	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	2,400	0.11	0.04	0.08	269	86	182
Roosevelt Schools NY	Centennial Avenue Elementary School	293	1	Jc 1080	2	2	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	750	0.11	0.04	0.07	83	33	50
Roosevelt Schools NY	Centennial Avenue Elementary School	294	1	Receiving 1082	3	3	0.0950	0.0300	1x4, 2-Lamp T8, H	LED Int. Driver Lamps, (2) 4' Lamps, HLO, XL	600	0.29	0.09	0.20	171	54	117
Roosevelt Schools NY	Centennial Avenue Elementary School	295	1	Hallway 1064 To 1082	6	6	0.0480	0.0210	2x2, 3-Lamp T8	LED Int. Driver Lamps, (3) 2' Lamps	2,400	0.29	0.13	0.16	691	302	389
Roosevelt Schools NY	Centennial Avenue Elementary School	296	1	Hallway 1064 To 1082	7	7	0.0280	0.0160	CF PL 26w	LED Retrofit Round Kit, 5.5 Inch, NLO	2,400	0.20	0.11	0.08	470	269	202
Roosevelt Schools NY	Centennial Avenue Elementary School	297	1	Hallway 1064 To 1082	21	21	0.0280	0.0160	CF PL 26w	LED Retrofit Round Kit, 5.5 Inch, NLO	2,400	0.59	0.34	0.25	1,411	806	605
Roosevelt Schools NY	Centennial Avenue Elementary School	298	1	Hallway 1064 To 1082	7	7	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Centennial Avenue Elementary School	299	1	Hallway 1064 To 1082 Display	1	1	0.0450	0.0220	1x3, 2-Lamp T8	LED Int. Driver Lamps, (2) 3' Lamps	3,750	0.05	0.02	0.02	169	83	86
Roosevelt Schools NY	Centennial Avenue Elementary School	300	1	Locker Rm, Women's 1092	2	2	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	2,000	0.14	0.07	0.07	284	140	144
Roosevelt Schools NY	Centennial Avenue Elementary School	301	1	Hallway Gym Women's	2	2	0.0280	0.0160	CF PL 26w	LED Retrofit Round Kit, 5.5 Inch, NLO	2,400	0.06	0.03	0.02	134	77	58
Roosevelt Schools NY	Centennial Avenue Elementary School	302	1	Office 1089	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,500	0.17	0.07	0.10	413	165	248
Roosevelt Schools NY	Centennial Avenue Elementary School	303	1	Stage 1087	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,500	0.17	0.07	0.10	413	165	248
Roosevelt Schools NY	Centennial Avenue Elementary School	304	1	Stage 1087	4	4	0.0550	0.0220	1x4, 2-Lamp T8, BB	LED Linear Lamp Kit, (2) 4' Lamps, BB	2,500	0.22	0.09	0.13	550	220	330
Roosevelt Schools NY	Centennial Avenue Elementary School	305	1	Locker Rm, Women's 1083	2	2	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	2,000	0.14	0.07	0.07	284	140	144
Roosevelt Schools NY	Centennial Avenue Elementary School	306	1	Hallway Gym Men's	2	2	0.0280	0.0160	CF PL 26w	LED Retrofit Round Kit, 5.5 Inch, NLO	2,400	0.06	0.03	0.02	134	77	58

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Roosevelt Schools NY	Centennial Avenue Elementary School	307	1	Office 1086	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,500	0.17	0.07	0.10	413	165	248
Roosevelt Schools NY	Centennial Avenue Elementary School	308	1	Gym 1064	2	2	0.0280	0.0160	CF PL 26w	LED Retrofit Round Kit, 5.5 Inch, NLO	2,500	0.06	0.03	0.02	140	80	60
Roosevelt Schools NY	Centennial Avenue Elementary School	309	1	Gym 1064	16	16	0.2880	0.1040	CF PL (8) 32w	LED High Bay, 17K Lumens, 2x2, OSF, WG, HCP	2,500	4.61	1.66	2.94	11,520	4,160	7,360
Roosevelt Schools NY	Centennial Avenue Elementary School	310	1	Gym 1064	4	4	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Centennial Avenue Elementary School	311	B	Storage 1064a	1	1	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XL	600	0.06	0.02	0.03	33	13	20
Roosevelt Schools NY	Centennial Avenue Elementary School	312	B	Storage 1064b	1	1	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XL	600	0.06	0.02	0.03	33	13	20
Roosevelt Schools NY	Centennial Avenue Elementary School	313	B	Elevator Lobby	2	2	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.11	0.04	0.07	66	26	40
Roosevelt Schools NY	Centennial Avenue Elementary School	314	B	Elevator Machine Room	2	2	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.11	0.04	0.07	66	26	40
Roosevelt Schools NY	Centennial Avenue Elementary School	315	B	Storage	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	750	0.66	0.26	0.40	495	198	297
Roosevelt Schools NY	Centennial Avenue Elementary School	316	B	Telecom Rm	8	8	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.44	0.18	0.26	264	106	158
Roosevelt Schools NY	Centennial Avenue Elementary School	317	B	Electrical Rm	8	8	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.44	0.18	0.26	264	106	158
Roosevelt Schools NY	Centennial Avenue Elementary School	318	B	Electrical Rm	2	2	0.0500	0.0500	Frog Eyes, 2X	will Not be Retrofit	30	0.10	0.10	-	3	3	-
Roosevelt Schools NY	Centennial Avenue Elementary School	319	B	Storage	1	1	0.0280	0.0110	1x4, 1-Lamp T8	LED Int. Driver Lamp, (1) 4' Lamp	750	0.03	0.01	0.02	21	8	13
Roosevelt Schools NY	Centennial Avenue Elementary School	320	B	Work Shop	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	750	0.66	0.26	0.40	495	198	297
Roosevelt Schools NY	Centennial Avenue Elementary School	321	B	Boiler Room	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	750	0.66	0.26	0.40	495	198	297
Roosevelt Schools NY	Centennial Avenue Elementary School	322	B	Hallway	14	14	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,750	0.77	0.31	0.46	2,888	1,155	1,733
Roosevelt Schools NY	Centennial Avenue Elementary School	323	B	Hallway	3	3	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Centennial Avenue Elementary School	324	SW	South Basement Stairwell	4	4	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,750	0.22	0.09	0.13	825	330	495
Roosevelt Schools NY	Centennial Avenue Elementary School	325	SW	North Basement Stairwell	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,750	0.17	0.07	0.10	619	248	371
Roosevelt Schools NY	Centennial Avenue Elementary School	326	SW	Stairwell 1	5	5	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,750	0.28	0.11	0.17	1,031	413	619
Roosevelt Schools NY	Centennial Avenue Elementary School	327	SW	Stairwell 1	2	2	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,750	0.11	0.04	0.07	413	165	248
Roosevelt Schools NY	Centennial Avenue Elementary School	328	SW	Stairwell 1	3	3	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Centennial Avenue Elementary School	329	SW	Stairwell 2	4	4	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,750	0.22	0.09	0.13	825	330	495
Roosevelt Schools NY	Centennial Avenue Elementary School	330	SW	Stairwell 2	1	1	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, HI	3,750	0.06	0.02	0.03	206	83	124
Roosevelt Schools NY	Centennial Avenue Elementary School	331	SW	Stairwell 2	2	2	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Centennial Avenue Elementary School	332	SW	Stairwell 3	1	1	0.0560	0.0170	CF PL (2) 26w	LED Retrofit Can Kit, 8 Inch, HLO	3,750	0.06	0.02	0.04	210	64	146
Roosevelt Schools NY	Centennial Avenue Elementary School	333	SW	Stairwell 3	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,750	0.17	0.07	0.10	619	248	371
Roosevelt Schools NY	Centennial Avenue Elementary School	334	SW	Stairwell 3	1	1	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,750	0.06	0.02	0.03	206	83	124
Roosevelt Schools NY	Centennial Avenue Elementary School	335	SW	Stairwell 3	1	1	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, HI	3,750	0.06	0.02	0.03	206	83	124
Roosevelt Schools NY	Centennial Avenue Elementary School	336	SW	Stairwell 3	2	2	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Centennial Avenue Elementary School	337	SW	Stairwell 4	9	9	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,750	0.50	0.20	0.30	1,856	743	1,114
Roosevelt Schools NY	Centennial Avenue Elementary School	338	SW	Stairwell 4	2	2	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Centennial Avenue Elementary School	339	1	Storage 1035	4	4	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	750	0.22	0.09	0.13	165	66	99
Roosevelt Schools NY	Centennial Avenue Elementary School	342	Ext	Walk Way Poles P	4	4	0.0500	0.0500	1x4, 1-Lamp T12, HO	will Not be Retrofit	4,380	0.20	0.20	-	876	876	-

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Roosevelt Schools NY	Centennial Avenue Elementary School	343	Ext	Parking Lot Pole Lcc	10	10	0.0500	0.0500	LED Fixture, 50W	will Not be Retrofit	4,380	0.50	0.50	-	2,190	2,190	-
Roosevelt Schools NY	Centennial Avenue Elementary School	344	Ext	Wall Pack L	17	17	0.0500	0.0500	LED Fixture, 50W	will Not be Retrofit	4,380	0.85	0.85	-	3,723	3,723	-
Roosevelt Schools NY	Centennial Avenue Elementary School	345	Ext	Canopy Cans Cnp	7	7	0.0900	0.0250	MH 70w	LED Lamp, A-Line, HLO, HID	4,380	0.63	0.18	0.46	2,759	767	1,993
Roosevelt Schools NY	Centennial Avenue Elementary School	346	Ext	Egress Door, No Emergency Light Nl	10	10	-	0.0280	New Layout	LED Wallpack, Forward Throw, 2000 Lumens, BB, MW30	4,380	-	0.28	(0.28)	-	1,226	(1,226)
Roosevelt Schools NY	Centennial Avenue Elementary School	347	Ext	Recessed Canopy	1	1	0.0360	0.0200	CF PL 32w	LED Canopy, 2000 Lumens, MM, XL	4,380	0.04	0.02	0.02	158	88	70
Roosevelt Schools NY	Centennial Avenue Elementary School	348	Ext	Building Wall Box M	20	20	0.1300	0.0250	MH 100w	LED Lamp, A-Line, HLO, HID	4,380	2.60	0.50	2.10	11,388	2,190	9,198
Roosevelt Schools NY	Centennial Avenue Elementary School	349	Ext	Ground Floods F	2	2	0.1500	0.0300	Halogen 150w	LED Flood Light ~3,000 Lumens, Photocell, KN	4,380	0.30	0.06	0.24	1,314	263	1,051
Roosevelt Schools NY	Centennial Avenue Elementary School	350	1	New Layout	47	47	-	-	New Layout	No Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt High School	1	2	Classroom A205	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.64	0.26	0.38	1,358	559	798
Roosevelt Schools NY	Roosevelt High School	2	2	Classroom A207	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.64	0.26	0.38	1,358	559	798
Roosevelt Schools NY	Roosevelt High School	3	2	Classroom A209	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.64	0.26	0.38	1,358	559	798
Roosevelt Schools NY	Roosevelt High School	4	2	Classroom A211	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.64	0.26	0.38	1,358	559	798
Roosevelt Schools NY	Roosevelt High School	5	2	Classroom A213	11	11	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.59	0.24	0.35	1,245	513	732
Roosevelt Schools NY	Roosevelt High School	6	2	Classroom A213b	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,000	0.05	0.02	0.03	160	66	94
Roosevelt Schools NY	Roosevelt High School	7	2	Classroom A215	11	11	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.59	0.24	0.35	1,245	513	732
Roosevelt Schools NY	Roosevelt High School	8	2	Classroom A210	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.64	0.26	0.38	1,358	559	798
Roosevelt Schools NY	Roosevelt High School	9	2	Classroom A208	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.64	0.26	0.38	1,358	559	798
Roosevelt Schools NY	Roosevelt High School	10	2	Classroom A206	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.64	0.26	0.38	1,358	559	798
Roosevelt Schools NY	Roosevelt High School	11	2	Classroom A204	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.64	0.26	0.38	1,358	559	798
Roosevelt Schools NY	Roosevelt High School	12	2	Classroom A202	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.64	0.26	0.38	1,358	559	798
Roosevelt Schools NY	Roosevelt High School	13	2	Classroom A200	15	15	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.80	0.33	0.47	1,697	699	998
Roosevelt Schools NY	Roosevelt High School	14	2	Electrical Room 200a	1	1	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4, Jack Chain Mount	750	0.05	0.03	0.03	40	19	21
Roosevelt Schools NY	Roosevelt High School	15	2	Electrical Room 200a	1	1	0.0500	0.0500	Frog Eyes, 2X	will Not be Retrofit	8,760	0.05	0.05	-	438	438	-
Roosevelt Schools NY	Roosevelt High School	16	2	Electrical Room 215a	2	2	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4, Jack Chain Mount	750	0.11	0.05	0.06	80	38	43
Roosevelt Schools NY	Roosevelt High School	17	2	Electrical Room 215a	1	1	0.0500	0.0500	Frog Eyes, 2X	will Not be Retrofit	8,760	0.05	0.05	-	438	438	-
Roosevelt Schools NY	Roosevelt High School	18	2	Server Room 215b	2	2	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4, Jack Chain Mount	750	0.11	0.05	0.06	80	38	43
Roosevelt Schools NY	Roosevelt High School	19	2	Facility Toilet 1	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,079	0.05	0.02	0.03	111	46	65
Roosevelt Schools NY	Roosevelt High School	20	2	Facility Toilet 2	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,079	0.05	0.02	0.03	111	46	65
Roosevelt Schools NY	Roosevelt High School	21	2	Girls Room	4	4	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,000	0.21	0.09	0.13	641	264	377
Roosevelt Schools NY	Roosevelt High School	22	2	Girl's Room	2	2	0.0280	0.0130	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	3,000	0.06	0.03	0.03	168	78	90
Roosevelt Schools NY	Roosevelt High School	23	2	Custodian 201a	1	1	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4, Jack Chain Mount	1,800	0.05	0.03	0.03	96	45	51
Roosevelt Schools NY	Roosevelt High School	24	2	Boy's Room	4	4	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,000	0.21	0.09	0.13	641	264	377
Roosevelt Schools NY	Roosevelt High School	25	2	Boy's Room	1	1	0.0280	0.0130	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	3,000	0.03	0.01	0.02	84	39	45
Roosevelt Schools NY	Roosevelt High School	26	2	Hallways H1	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,000	0.64	0.26	0.38	1,922	792	1,130

Roosevelt UFSD, NY
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ECM 1 - LED Lighting and Lighting Controls Upgrade
Lighting Line by Line

Site Name	Building Name	Index	Floor	Location	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Roosevelt Schools NY	Roosevelt High School	27	2	Hallway H1	7	7	0.0534	0.0220	1x4, 2-Lamp T8, EM	LED Int. Driver Lamps, (2) 4' Lamps	8,760	0.37	0.15	0.22	3,274	1,349	1,925
Roosevelt Schools NY	Roosevelt High School	28	2	Hallway H1	1	1	0.0280	0.0130	CF PL 26w, EM	LED Retrofit Can Kit, 6 Inch, NLO	8,760	0.03	0.01	0.02	245	114	131
Roosevelt Schools NY	Roosevelt High School	29	2	Hallway H1	2	2	-	-	Exit Sign - LED, BB	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt High School	30	2	Hallway H1	2	2	-	-	Exit Sign - LED, BB	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt High School	31	2	Classroom A216	10	10	0.1068	0.0440	2x4, 4-Lamp T8, DS	LED Int. Driver Lamps, (4) 4' Lamps, DS	2,119	1.07	0.44	0.63	2,263	932	1,331
Roosevelt Schools NY	Roosevelt High School	32	2	Classroom A216b	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,000	0.05	0.02	0.03	160	66	94
Roosevelt Schools NY	Roosevelt High School	33	2	Storage St1	3	3	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	750	0.16	0.07	0.09	120	54	66
Roosevelt Schools NY	Roosevelt High School	34	2	Conference Room	3	3	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	1,000	0.16	0.07	0.09	160	72	88
Roosevelt Schools NY	Roosevelt High School	35	2	Storage A222a	2	2	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	800	0.11	0.04	0.06	85	35	50
Roosevelt Schools NY	Roosevelt High School	36	2	Facility Toilet 3	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	704	0.05	0.02	0.03	38	15	22
Roosevelt Schools NY	Roosevelt High School	37	2	Classroom A222c	9	9	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	2,119	0.48	0.22	0.26	1,018	458	561
Roosevelt Schools NY	Roosevelt High School	38	2	Classroom A222c	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.05	0.02	0.03	113	47	67
Roosevelt Schools NY	Roosevelt High School	39	2	Hallways H2	7	7	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,000	0.37	0.15	0.22	1,121	462	659
Roosevelt Schools NY	Roosevelt High School	40	2	Hallways H2	4	4	0.0534	0.0220	1x4, 2-Lamp T8, EM	LED Int. Driver Lamps, (2) 4' Lamps	8,760	0.21	0.09	0.13	1,871	771	1,100
Roosevelt Schools NY	Roosevelt High School	41	2	Hallways H2	4	4	0.0280	0.0130	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	3,000	0.11	0.05	0.06	336	156	180
Roosevelt Schools NY	Roosevelt High School	42	2	Hallways H2	2	2	-	-	Exit Sign - LED, BB	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt High School	43	2	Classroom B234	20	20	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	1.07	0.44	0.63	2,263	932	1,331
Roosevelt Schools NY	Roosevelt High School	44	2	Classroom B232	11	11	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.59	0.24	0.35	1,245	513	732
Roosevelt Schools NY	Roosevelt High School	45	2	Classroom B232b	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,000	0.05	0.02	0.03	160	66	94
Roosevelt Schools NY	Roosevelt High School	46	2	Classroom B230	8	8	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.43	0.18	0.25	905	373	532
Roosevelt Schools NY	Roosevelt High School	47	2	Electrical Room B231	1	1	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4, Jack Chain Mount	750	0.05	0.03	0.03	40	19	21
Roosevelt Schools NY	Roosevelt High School	48	2	Classroom B233	3	3	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	2,119	0.16	0.07	0.09	339	153	187
Roosevelt Schools NY	Roosevelt High School	49	2	Classroom B235	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.64	0.26	0.38	1,358	559	798
Roosevelt Schools NY	Roosevelt High School	50	2	Classroom B237	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.64	0.26	0.38	1,358	559	798
Roosevelt Schools NY	Roosevelt High School	51	2	Facility Development B239	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,000	0.64	0.26	0.38	1,282	528	754
Roosevelt Schools NY	Roosevelt High School	52	2	Classroom B241	24	24	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	1.28	0.53	0.75	2,716	1,119	1,597
Roosevelt Schools NY	Roosevelt High School	53	2	Classroom B241	1	1	0.0534	0.0220	1x4, 2-Lamp T8, EM	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.05	0.02	0.03	113	47	67
Roosevelt Schools NY	Roosevelt High School	54	2	Prep Room B241a	3	3	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	2,119	0.16	0.07	0.09	339	153	187
Roosevelt Schools NY	Roosevelt High School	55	2	Prep Room B241a	1	1	0.0273	0.0110	1x4, 1-Lamp T8	LED Int. Driver Lamp, (1) 4' Lamp	2,119	0.03	0.01	0.02	58	23	35
Roosevelt Schools NY	Roosevelt High School	56	2	Classroom B243	20	20	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	1.07	0.44	0.63	2,263	932	1,331
Roosevelt Schools NY	Roosevelt High School	57	2	Classroom B246	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.64	0.26	0.38	1,358	559	798
Roosevelt Schools NY	Roosevelt High School	58	2	Electrical Room B246	1	1	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4, Jack Chain Mount	750	0.05	0.03	0.03	40	19	21
Roosevelt Schools NY	Roosevelt High School	59	2	Classroom B244	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.64	0.26	0.38	1,358	559	798
Roosevelt Schools NY	Roosevelt High School	60	2	Classroom B242	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.64	0.26	0.38	1,358	559	798

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Roosevelt Schools NY	Roosevelt High School	61	2	Boys Room	5	5	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,760	0.27	0.11	0.16	470	194	276
Roosevelt Schools NY	Roosevelt High School	62	2	Boys Room	1	1	0.0280	0.0130	CF PL 26w, EM	LED Retrofit Can Kit, 6 Inch, NLO	1,760	0.03	0.01	0.02	49	23	26
Roosevelt Schools NY	Roosevelt High School	63	2	Girls Room	5	5	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,760	0.27	0.11	0.16	470	194	276
Roosevelt Schools NY	Roosevelt High School	64	2	Girls Room	1	1	0.0280	0.0130	CF PL 26w, EM	LED Retrofit Can Kit, 6 Inch, NLO	1,760	0.03	0.01	0.02	49	23	26
Roosevelt Schools NY	Roosevelt High School	65	2	Custodian 238b	1	1	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4, Jack Chain Mount	600	0.05	0.03	0.03	32	15	17
Roosevelt Schools NY	Roosevelt High School	66	2	Hallways H3	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,000	0.64	0.26	0.38	1,922	792	1,130
Roosevelt Schools NY	Roosevelt High School	67	2	Hallways H3	7	7	0.0534	0.0220	1x4, 2-Lamp T8, EM	LED Int. Driver Lamps, (2) 4' Lamps	8,760	0.37	0.15	0.22	3,274	1,349	1,925
Roosevelt Schools NY	Roosevelt High School	68	2	Hallways H3	10	10	0.0280	0.0130	CF PL 26w, EM	LED Retrofit Can Kit, 6 Inch, NLO	8,760	0.28	0.13	0.15	2,453	1,139	1,314
Roosevelt Schools NY	Roosevelt High School	69	2	Hallways H3	4	4	0.0280	0.0130	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	3,000	0.11	0.05	0.06	336	156	180
Roosevelt Schools NY	Roosevelt High School	70	2	Hallway H3	2	2	-	-	Exit Sign - LED, BB	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt High School	71	2	Hallway H3	2	2	-	-	Exit Sign - LED, BB	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt High School	72	2	Server Room 2	2	2	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4, Jack Chain Mount	750	0.11	0.05	0.06	80	38	43
Roosevelt Schools NY	Roosevelt High School	73	2	Hallways H4	6	6	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,000	0.32	0.13	0.19	961	396	565
Roosevelt Schools NY	Roosevelt High School	74	2	Hallways H4	4	4	0.0534	0.0220	1x4, 2-Lamp T8, EM	LED Int. Driver Lamps, (2) 4' Lamps	8,760	0.21	0.09	0.13	1,871	771	1,100
Roosevelt Schools NY	Roosevelt High School	75	2	Hallways H4	2	2	-	-	Exit Sign - LED, BB	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt High School	76	2	Classroom C268	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.64	0.26	0.38	1,358	559	798
Roosevelt Schools NY	Roosevelt High School	77	2	Classroom C266	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.64	0.26	0.38	1,358	559	798
Roosevelt Schools NY	Roosevelt High School	78	2	Classroom C264	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.64	0.26	0.38	1,358	559	798
Roosevelt Schools NY	Roosevelt High School	79	2	Boys Room	4	4	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,760	0.21	0.09	0.13	376	155	221
Roosevelt Schools NY	Roosevelt High School	80	2	Boys Room	2	2	0.0280	0.0130	CF PL 26w, EM	LED Retrofit Can Kit, 6 Inch, NLO	1,760	0.06	0.03	0.03	99	46	53
Roosevelt Schools NY	Roosevelt High School	81	2	Electrical Room C260	1	1	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4, Jack Chain Mount	750	0.05	0.03	0.03	40	19	21
Roosevelt Schools NY	Roosevelt High School	82	2	Custodian Room C258	1	1	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4, Jack Chain Mount	600	0.05	0.03	0.03	32	15	17
Roosevelt Schools NY	Roosevelt High School	83	2	Girls Room	4	4	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,760	0.21	0.09	0.13	376	155	221
Roosevelt Schools NY	Roosevelt High School	84	2	Girls Room	2	2	0.0280	0.0130	CF PL 26w, EM	LED Retrofit Can Kit, 6 Inch, NLO	1,760	0.06	0.03	0.03	99	46	53
Roosevelt Schools NY	Roosevelt High School	85	2	Classroom C254	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.64	0.26	0.38	1,358	559	798
Roosevelt Schools NY	Roosevelt High School	86	2	Classroom C252	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.64	0.26	0.38	1,358	559	798
Roosevelt Schools NY	Roosevelt High School	87	2	Classroom C250	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.64	0.26	0.38	1,358	559	798
Roosevelt Schools NY	Roosevelt High School	88	2	Classroom C251	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.64	0.26	0.38	1,358	559	798
Roosevelt Schools NY	Roosevelt High School	89	2	Classroom C253	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.64	0.26	0.38	1,358	559	798
Roosevelt Schools NY	Roosevelt High School	90	2	Classroom C255	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.64	0.26	0.38	1,358	559	798
Roosevelt Schools NY	Roosevelt High School	91	2	Facility Toilet Ft3	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,079	0.05	0.02	0.03	111	46	65
Roosevelt Schools NY	Roosevelt High School	92	2	Classroom C259	10	10	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.53	0.22	0.31	1,132	466	665
Roosevelt Schools NY	Roosevelt High School	93	2	Classroom C259a	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,000	0.05	0.02	0.03	160	66	94
Roosevelt Schools NY	Roosevelt High School	94	2	Classroom C261	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.64	0.26	0.38	1,358	559	798

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Site Name	Building Name	Index	Floor	Location	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Roosevelt Schools NY	Roosevelt High School	95	2	Classroom C263	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.64	0.26	0.38	1,358	559	798
Roosevelt Schools NY	Roosevelt High School	96	2	Classroom C265	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.64	0.26	0.38	1,358	559	798
Roosevelt Schools NY	Roosevelt High School	97	2	Classroom C267	3	3	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	2,119	0.16	0.07	0.09	339	153	187
Roosevelt Schools NY	Roosevelt High School	98	2	Classroom C267a	2	2	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	2,119	0.11	0.05	0.06	226	102	125
Roosevelt Schools NY	Roosevelt High School	99	2	Classroom C267b	2	2	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	2,119	0.11	0.05	0.06	226	102	125
Roosevelt Schools NY	Roosevelt High School	100	2	Classroom C267c	2	2	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	2,119	0.11	0.05	0.06	226	102	125
Roosevelt Schools NY	Roosevelt High School	101	2	Hallways H5	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,000	0.64	0.26	0.38	1,922	792	1,130
Roosevelt Schools NY	Roosevelt High School	102	2	Hallways H5	7	7	0.0534	0.0220	1x4, 2-Lamp T8, EM	LED Int. Driver Lamps, (2) 4' Lamps	8,760	0.37	0.15	0.22	3,274	1,349	1,925
Roosevelt Schools NY	Roosevelt High School	103	2	Hallways H5	13	13	0.0280	0.0130	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	3,000	0.36	0.17	0.20	1,092	507	585
Roosevelt Schools NY	Roosevelt High School	104	2	Hallways H5	3	3	0.0280	0.0130	CF PL 26w, EM	LED Retrofit Can Kit, 6 Inch, NLO	8,760	0.08	0.04	0.05	736	342	394
Roosevelt Schools NY	Roosevelt High School	105	2	Hallways H5	4	4	-	-	Exit Sign - LED, BB	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt High School	106	2	Hallways H6	6	6	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,000	0.32	0.13	0.19	961	396	565
Roosevelt Schools NY	Roosevelt High School	107	2	Hallways H6	3	3	0.0534	0.0220	1x4, 2-Lamp T8, EM	LED Int. Driver Lamps, (2) 4' Lamps	8,760	0.16	0.07	0.09	1,403	578	825
Roosevelt Schools NY	Roosevelt High School	108	2	Hallways H6	2	2	0.0280	0.0130	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	3,000	0.06	0.03	0.03	168	78	90
Roosevelt Schools NY	Roosevelt High School	109	2	Hallways H6	4	4	-	-	Exit Sign - LED, BB	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt High School	110	2	Stairwells C1	3	3	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,750	0.16	0.07	0.09	601	248	353
Roosevelt Schools NY	Roosevelt High School	111	2	Stairwells C1	1	1	-	-	Exit Sign - LED, BB	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt High School	112	2	Stairwells C2	3	3	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,750	0.16	0.07	0.09	601	248	353
Roosevelt Schools NY	Roosevelt High School	113	2	Stairwells C2	1	1	-	-	Exit Sign - LED, BB	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt High School	114	2	Stairwells B1	3	3	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,750	0.16	0.07	0.09	601	248	353
Roosevelt Schools NY	Roosevelt High School	115	2	Stairwells B1	1	1	-	-	Exit Sign - LED, BB	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt High School	116	2	Stairwells B2	3	3	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,750	0.16	0.07	0.09	601	248	353
Roosevelt Schools NY	Roosevelt High School	117	2	Stairwells B2	1	1	-	-	Exit Sign - LED, BB	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt High School	118	2	Stairwells A2	6	6	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,750	0.32	0.13	0.19	1,202	495	707
Roosevelt Schools NY	Roosevelt High School	119	2	Stairwells A2	2	2	-	-	Exit Sign - LED, BB	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt High School	120	2	Stairwells A1	3	3	0.0280	0.0130	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	3,750	0.08	0.04	0.05	315	146	169
Roosevelt Schools NY	Roosevelt High School	121	2	Stairwells A1	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,750	0.05	0.02	0.03	200	83	118
Roosevelt Schools NY	Roosevelt High School	122	1	Classroom A101	16	16	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.85	0.35	0.50	1,810	746	1,065
Roosevelt Schools NY	Roosevelt High School	123	2	Classroom A103	25	25	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	1.34	0.55	0.79	2,829	1,165	1,663
Roosevelt Schools NY	Roosevelt High School	124	2	Prep Room A103a	3	3	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	2,119	0.16	0.07	0.09	339	153	187
Roosevelt Schools NY	Roosevelt High School	125	2	Prep Room A103a	1	1	0.0273	0.0110	1x4, 1-Lamp T8	LED Int. Driver Lamp, (1) 4' Lamp	2,119	0.03	0.01	0.02	58	23	35
Roosevelt Schools NY	Roosevelt High School	126	2	Classroom A105	16	16	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.85	0.35	0.50	1,810	746	1,065
Roosevelt Schools NY	Roosevelt High School	127	2	Dance Studios A107	14	14	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.75	0.31	0.44	1,584	653	932
Roosevelt Schools NY	Roosevelt High School	128	2	Dance Studios A107a	3	3	0.0795	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	2,119	0.24	0.10	0.14	505	210	296

Roosevelt UFSD, NY
Exhibit D-5-1
ECM 1 - LED Lighting and Lighting Controls Upgrade
Lighting Line by Line

Site Name	Building Name	Index	Floor	Location	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Roosevelt Schools NY	Roosevelt High School	129	2	Dance Studios A107b	3	3	0.0795	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	2,119	0.24	0.10	0.14	505	210	296
Roosevelt Schools NY	Roosevelt High School	130	1	Chorus A109	16	16	0.0317	0.0160	2x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	2,119	0.51	0.26	0.25	1,075	542	532
Roosevelt Schools NY	Roosevelt High School	131	1	Chorus A109	8	8	0.0280	0.0130	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	2,119	0.22	0.10	0.12	475	220	254
Roosevelt Schools NY	Roosevelt High School	132	1	Practice Room A109a	1	1	0.0795	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	2,119	0.08	0.03	0.05	168	70	99
Roosevelt Schools NY	Roosevelt High School	133	1	Practice Room A109b	2	2	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	2,119	0.11	0.05	0.06	226	102	125
Roosevelt Schools NY	Roosevelt High School	134	1	Men's Room 1	3	3	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,400	0.16	0.07	0.09	384	158	226
Roosevelt Schools NY	Roosevelt High School	135	1	Men's Room 1	1	1	0.0280	0.0130	CF PL 26w, EM	LED Retrofit Can Kit, 6 Inch, NLO	2,400	0.03	0.01	0.02	67	31	36
Roosevelt Schools NY	Roosevelt High School	136	1	Women's Room 1	3	3	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,400	0.16	0.07	0.09	384	158	226
Roosevelt Schools NY	Roosevelt High School	137	1	Women's Room 1	1	1	0.0280	0.0130	CF PL 26w, EM	LED Retrofit Can Kit, 6 Inch, NLO	2,400	0.03	0.01	0.02	67	31	36
Roosevelt Schools NY	Roosevelt High School	138	1	Band A115	28	28	0.0317	0.0160	2x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	2,119	0.89	0.45	0.44	1,881	949	932
Roosevelt Schools NY	Roosevelt High School	139	1	Band A115	2	2	-	-	Exit Sign - LED, BB	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt High School	140	1	Practice Room A115b	1	1	0.0795	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	2,119	0.08	0.03	0.05	168	70	99
Roosevelt Schools NY	Roosevelt High School	141	1	Practice Room A115a	1	1	0.0795	0.0330	2x4, 3-Lamp T8, DS	LED Int. Driver Lamps, (3) 4' Lamps, DS	2,119	0.08	0.03	0.05	168	70	99
Roosevelt Schools NY	Roosevelt High School	142	1	Hallways H1	10	10	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,000	0.53	0.22	0.31	1,602	660	942
Roosevelt Schools NY	Roosevelt High School	143	1	Hallways H1	7	7	0.0534	0.0220	1x4, 2-Lamp T8, EM	LED Int. Driver Lamps, (2) 4' Lamps	8,760	0.37	0.15	0.22	3,274	1,349	1,925
Roosevelt Schools NY	Roosevelt High School	144	1	Hallways H1	8	8	0.0280	0.0130	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	3,000	0.22	0.10	0.12	672	312	360
Roosevelt Schools NY	Roosevelt High School	145	1	Hallways H1	4	4	0.0280	0.0130	CF PL 26w, EM	LED Retrofit Can Kit, 6 Inch, NLO	8,760	0.11	0.05	0.06	981	456	526
Roosevelt Schools NY	Roosevelt High School	146	1	Hallways H1	4	4	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt High School	147	1	Classroom A112	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.64	0.26	0.38	1,358	559	798
Roosevelt Schools NY	Roosevelt High School	148	1	Administration Office A110	4	4	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	2,119	0.21	0.10	0.12	453	203	249
Roosevelt Schools NY	Roosevelt High School	149	1	Administration Office A110a	2	2	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	2,119	0.11	0.05	0.06	226	102	125
Roosevelt Schools NY	Roosevelt High School	150	1	Administration Office A110b	2	2	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	2,119	0.11	0.05	0.06	226	102	125
Roosevelt Schools NY	Roosevelt High School	151	1	Classroom A108	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.64	0.26	0.38	1,358	559	798
Roosevelt Schools NY	Roosevelt High School	152	1	Classroom A106	11	11	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.59	0.24	0.35	1,245	513	732
Roosevelt Schools NY	Roosevelt High School	153	1	Classroom A106a	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	704	0.05	0.02	0.03	38	15	22
Roosevelt Schools NY	Roosevelt High School	154	1	Classroom A104	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.64	0.26	0.38	1,358	559	798
Roosevelt Schools NY	Roosevelt High School	155	1	Electrical Room A100	1	1	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4, Jack Chain Mount	750	0.05	0.03	0.03	40	19	21
Roosevelt Schools NY	Roosevelt High School	156	1	Classroom A100	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.64	0.26	0.38	1,358	559	798
Roosevelt Schools NY	Roosevelt High School	157	1	Classroom A100a	6	6	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.32	0.13	0.19	679	280	399
Roosevelt Schools NY	Roosevelt High School	158	1	Classroom A100a	1	1	0.0500	0.0500	Frog Eyes	will Not be Retrofit	8,760	0.05	0.05	-	438	438	-
Roosevelt Schools NY	Roosevelt High School	159	1	Classroom A100b	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.05	0.02	0.03	113	47	67
Roosevelt Schools NY	Roosevelt High School	160	1	Hallways H2	14	14	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,000	0.75	0.31	0.44	2,243	924	1,319
Roosevelt Schools NY	Roosevelt High School	161	1	Hallways H2	8	8	0.0534	0.0220	1x4, 2-Lamp T8, EM	LED Int. Driver Lamps, (2) 4' Lamps	8,760	0.43	0.18	0.25	3,742	1,542	2,201
Roosevelt Schools NY	Roosevelt High School	162	1	Hallways H2	3	3	-	-	Exit Sign - LED, BB	will Not be Retrofit	8,760	-	-	-	-	-	-

Roosevelt UFSD, NY
Exhibit D-5-1
ECM 1 - LED Lighting and Lighting Controls Upgrade
Lighting Line by Line

Site Name	Building Name	Index	Floor	Location	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Roosevelt Schools NY	Roosevelt High School	163	1	Hallways H2	1	1	-	-	Exit Sign - LED, BB	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt High School	164	1	Hallways H2	2	2	0.0280	0.0130	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	3,000	0.06	0.03	0.03	168	78	90
Roosevelt Schools NY	Roosevelt High School	165	1	Storage A114f	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	750	0.05	0.02	0.03	40	17	24
Roosevelt Schools NY	Roosevelt High School	166	1	Stage	16	16	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4, Jack Chain Mount, STAGE SCAFFOLD	1,760	0.85	0.40	0.45	1,504	704	800
Roosevelt Schools NY	Roosevelt High School	167	1	Stage	2	2	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4, Jack Chain Mount	1,760	0.11	0.05	0.06	188	88	100
Roosevelt Schools NY	Roosevelt High School	168	1	Stage	3	3	-	-	Exit Sign - LED, BB	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt High School	169	1	Stage	4	4	0.0500	0.0500	Frog Eyes	will Not be Retrofit	8,760	0.20	0.20	-	1,752	1,752	-
Roosevelt Schools NY	Roosevelt High School	170	1	Change Room A114b	2	2	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.11	0.04	0.06	64	26	38
Roosevelt Schools NY	Roosevelt High School	171	1	Change Room A114c	2	2	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.11	0.04	0.06	64	26	38
Roosevelt Schools NY	Roosevelt High School	172	1	Auditorium A114	48	48	0.0860	0.0270	CF PL (2) 42w, DIM	LED Retrofit Can Kit, 10 Inch, HLO, DIM, 120v, XL, HI	1,760	4.13	1.30	2.83	7,265	2,281	4,984
Roosevelt Schools NY	Roosevelt High School	173	1	Auditorium A114	10	10	0.0860	0.0270	CF PL (2) 42w, BB, DIM	LED Retrofit Can Kit, 10 Inch, Goof Ring, HLO,120V DIM, BB	1,760	0.86	0.27	0.59	1,514	475	1,038
Roosevelt Schools NY	Roosevelt High School	174	1	Auditorium A114	4	4	0.0860	0.0270	CF PL (2) 42w, DIM	LED Retrofit Can Kit, 10 Inch, HLO, DIM, 120v, XL, HI	1,760	0.34	0.11	0.24	605	190	415
Roosevelt Schools NY	Roosevelt High School	175	1	Auditorium A114	4	4	0.0860	0.0270	CF PL (2) 42w, BB, DIM	LED Retrofit Can Kit, 10 Inch, Goof Ring, HLO,120V DIM, BB	1,760	0.34	0.11	0.24	605	190	415
Roosevelt Schools NY	Roosevelt High School	176	1	Auditorium A114	2	2	0.0400	0.0150	CF PL (2) 18w	LED Retrofit Half Circle Kit, 9 Inch, NLO, XL, HI	1,760	0.08	0.03	0.05	141	53	88
Roosevelt Schools NY	Roosevelt High School	177	1	Auditorium A114	2	2	0.0400	0.0150	CF PL (2) 18w	LED Retrofit Half Circle Kit, 9 Inch, NLO, XL, HI	1,760	0.08	0.03	0.05	141	53	88
Roosevelt Schools NY	Roosevelt High School	178	1	Auditorium A114	6	6	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt High School	179	1	Control Room	4	4	0.0280	0.0130	CF PL 26w, Dimmable	LED Retrofit Can Kit, 6 Inch, NLO, DIM	1,760	0.11	0.05	0.06	197	92	106
Roosevelt Schools NY	Roosevelt High School	180	1	Hallways H3	15	15	0.0280	0.0130	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	3,000	0.42	0.20	0.23	1,260	585	675
Roosevelt Schools NY	Roosevelt High School	181	1	Hallways H3	7	7	0.0280	0.0130	CF PL 26w, EM	LED Retrofit Can Kit, 6 Inch, NLO	3,000	0.20	0.09	0.11	588	273	315
Roosevelt Schools NY	Roosevelt High School	182	1	Hallways H3	4	4	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt High School	183	1	Foyer Fo1	5	5	0.0280	0.0130	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	3,000	0.14	0.07	0.08	420	195	225
Roosevelt Schools NY	Roosevelt High School	184	1	Display Case 1	2	2	0.0237	0.0110	1x3, 1-Lamp T8	LED Int. Driver Lamp, (1) 3' Lamp	750	0.05	0.02	0.03	36	17	19
Roosevelt Schools NY	Roosevelt High School	185	1	Storage A114a	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	750	0.05	0.02	0.03	40	17	24
Roosevelt Schools NY	Roosevelt High School	186	1	Mechanical A114e	8	8	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4, Jack Chain Mount	750	0.43	0.20	0.23	320	150	170
Roosevelt Schools NY	Roosevelt High School	187	1	Mechanical A114e	2	2	0.0534	0.0250	1x4, 2-Lamp T8, EM	LED Standard Wrap, NLO, 1x4, Jack Chain Mount	750	0.11	0.05	0.06	80	38	43
Roosevelt Schools NY	Roosevelt High School	188	1	Mechanical A114e	2	2	0.0534	0.0250	1x4, 2-Lamp T8, EM	LED Standard Wrap, NLO, 1x4	750	0.11	0.05	0.06	80	38	43
Roosevelt Schools NY	Roosevelt High School	189	1	Custodian Closet A116	1	1	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4, Jack Chain Mount	600	0.05	0.03	0.03	32	15	17
Roosevelt Schools NY	Roosevelt High School	190	1	Elevator Room	2	2	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4, Jack Chain Mount	750	0.11	0.05	0.06	80	38	43
Roosevelt Schools NY	Roosevelt High School	191	1	Facility Toilet 1	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,400	0.05	0.02	0.03	128	53	75
Roosevelt Schools NY	Roosevelt High School	192	1	Guidance A122	12	12	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	1,440	0.64	0.29	0.35	923	415	508
Roosevelt Schools NY	Roosevelt High School	193	1	Guidance A122a	2	2	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	1,440	0.11	0.05	0.06	154	69	85
Roosevelt Schools NY	Roosevelt High School	194	1	Guidance A122b	2	2	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	1,440	0.11	0.05	0.06	154	69	85
Roosevelt Schools NY	Roosevelt High School	195	1	Guidance A122c	2	2	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	1,440	0.11	0.05	0.06	154	69	85
Roosevelt Schools NY	Roosevelt High School	196	1	Guidance A122d	2	2	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	1,440	0.11	0.05	0.06	154	69	85

Roosevelt UFSD, NY
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Lighting Line by Line

Site Name	Building Name	Index	Floor	Location	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Roosevelt Schools NY	Roosevelt High School	197	1	Guidance A122e	2	2	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	1,440	0.11	0.05	0.06	154	69	85
Roosevelt Schools NY	Roosevelt High School	198	1	Guidance A122f	4	4	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	1,440	0.21	0.10	0.12	308	138	169
Roosevelt Schools NY	Roosevelt High School	199	1	Guidance A122g	2	2	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	1,440	0.11	0.05	0.06	154	69	85
Roosevelt Schools NY	Roosevelt High School	200	1	Guidance A122h	2	2	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	1,440	0.11	0.05	0.06	154	69	85
Roosevelt Schools NY	Roosevelt High School	201	1	Guidance A122i	1	1	0.0280	0.0130	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	1,440	0.03	0.01	0.02	40	19	22
Roosevelt Schools NY	Roosevelt High School	202	1	Guidance A122j	1	1	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4, Jack Chain Mount	1,440	0.05	0.03	0.03	77	36	41
Roosevelt Schools NY	Roosevelt High School	203	1	Storage 2	2	2	0.0317	0.0160	2x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	1,440	0.06	0.03	0.03	91	46	45
Roosevelt Schools NY	Roosevelt High School	204	1	Hallways H4	6	6	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,000	0.32	0.13	0.19	961	396	565
Roosevelt Schools NY	Roosevelt High School	205	1	Hallways H4	3	3	0.0534	0.0220	1x4, 2-Lamp T8, EM	LED Int. Driver Lamps, (2) 4' Lamps	3,000	0.16	0.07	0.09	481	198	283
Roosevelt Schools NY	Roosevelt High School	206	1	Hallways H4	3	3	-	-	Exit Sign - LED, BB	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt High School	207	1	Hallways H4	1	1	-	-	Exit Sign - LED, BB	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt High School	208	1	Telcom A117	3	3	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4, Jack Chain Mount	750	0.16	0.08	0.09	120	56	64
Roosevelt Schools NY	Roosevelt High School	209	2	Restroom 1	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,760	0.05	0.02	0.03	94	39	55
Roosevelt Schools NY	Roosevelt High School	210	1	Library 011	32	32	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,760	1.71	0.70	1.00	3,007	1,239	1,768
Roosevelt Schools NY	Roosevelt High School	211	1	Library 011	4	4	0.0280	0.0070	CF PL 26w	LED Retrofit Can Kit, 4 Inch, NLO	1,760	0.11	0.03	0.08	197	49	148
Roosevelt Schools NY	Roosevelt High School	212	1	Library 011	3	3	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt High School	213	1	Library 011	20	20	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,760	1.24	0.50	0.74	2,182	880	1,302
Roosevelt Schools NY	Roosevelt High School	214	1	Library 011	9	9	0.3500	0.1020	6-Lamp 55 Biax	LED Int. Driver Lamp, (6) 55w BX EQ, XL	1,760	3.15	0.92	2.23	5,544	1,616	3,928
Roosevelt Schools NY	Roosevelt High School	215	1	Library 011b	2	2	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.11	0.05	0.06	342	154	188
Roosevelt Schools NY	Roosevelt High School	216	1	Library 011c	3	3	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.16	0.07	0.09	513	230	282
Roosevelt Schools NY	Roosevelt High School	217	1	Library 011e	3	3	0.0795	0.0330	2x4, 3-Lamp T8, DS	LED Int. Driver Lamps, (3) 4' Lamps, DS	3,200	0.24	0.10	0.14	763	317	446
Roosevelt Schools NY	Roosevelt High School	218	1	Library 011d	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.05	0.02	0.03	32	13	19
Roosevelt Schools NY	Roosevelt High School	219	1	Schools Store B131	2	2	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	1,440	0.11	0.05	0.06	154	69	85
Roosevelt Schools NY	Roosevelt High School	220	1	Custodian Office B133	2	2	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	1,440	0.11	0.05	0.06	154	69	85
Roosevelt Schools NY	Roosevelt High School	221	1	Custodian Office B133a	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,760	0.05	0.02	0.03	94	39	55
Roosevelt Schools NY	Roosevelt High School	222	1	Culinary Arts B135	16	16	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.85	0.35	0.50	1,810	746	1,065
Roosevelt Schools NY	Roosevelt High School	223	1	Culinary Arts B135a	24	24	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	1.28	0.53	0.75	2,716	1,119	1,597
Roosevelt Schools NY	Roosevelt High School	224	1	Culinary Arts B135a	3	3	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.16	0.07	0.09	339	140	200
Roosevelt Schools NY	Roosevelt High School	225	1	Storage B135b	2	2	0.0795	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	2,119	0.16	0.07	0.09	337	140	197
Roosevelt Schools NY	Roosevelt High School	226	1	Storage B135c	1	1	0.0543	0.0210	2x2, 2-Lamp U T8	LED Int. Driver Lamps, (3) 2' Lamps, 2x2 Kit	2,119	0.05	0.02	0.03	115	44	71
Roosevelt Schools NY	Roosevelt High School	227	1	Walk In Cooler B135d	2	2	0.1170	0.0500	1x4, 2-Lamp T5 HO	LED Int. Driver Lamp, (2) 4' T5 HO Lamps, Extra Labor	2,119	0.23	0.10	0.13	496	212	284
Roosevelt Schools NY	Roosevelt High School	228	1	Cte B137	36	36	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	1.92	0.79	1.13	4,074	1,678	2,395
Roosevelt Schools NY	Roosevelt High School	229	1	Storage B139	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,440	0.05	0.02	0.03	77	32	45
Roosevelt Schools NY	Roosevelt High School	230	1	Classroom B141	19	19	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	1.01	0.42	0.60	2,150	886	1,264

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ECM 1 - LED Lighting and Lighting Controls Upgrade
Lighting Line by Line

Site Name	Building Name	Index	Floor	Location	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Roosevelt Schools NY	Roosevelt High School	231	1	Prep Room A141a	3	3	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	2,119	0.16	0.07	0.09	339	153	187
Roosevelt Schools NY	Roosevelt High School	232	1	Prep Room A141a	1	1	0.0273	0.0110	1x4, 1-Lamp T8	LED Int. Driver Lamp, (1) 4' Lamp	2,119	0.03	0.01	0.02	58	23	35
Roosevelt Schools NY	Roosevelt High School	233	1	Classroom B143	25	25	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	1.34	0.55	0.79	2,829	1,165	1,663
Roosevelt Schools NY	Roosevelt High School	234	1	Classroom B145	25	25	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	1.34	0.55	0.79	2,829	1,165	1,663
Roosevelt Schools NY	Roosevelt High School	235	1	Prep Room A145a	3	3	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	2,119	0.16	0.07	0.09	339	153	187
Roosevelt Schools NY	Roosevelt High School	236	1	Prep Room A145a	1	1	0.0273	0.0110	1x4, 1-Lamp T8	LED Int. Driver Lamp, (1) 4' Lamp	2,119	0.03	0.01	0.02	58	23	35
Roosevelt Schools NY	Roosevelt High School	237	1	Classroom B141	20	20	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	1.07	0.44	0.63	2,263	932	1,331
Roosevelt Schools NY	Roosevelt High School	238	1	Classroom B150	21	21	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	1.12	0.46	0.66	2,376	979	1,397
Roosevelt Schools NY	Roosevelt High School	239	1	Prep Room A148a	2	2	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	2,119	0.11	0.05	0.06	226	102	125
Roosevelt Schools NY	Roosevelt High School	240	1	Classroom B148	21	21	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	1.12	0.46	0.66	2,376	979	1,397
Roosevelt Schools NY	Roosevelt High School	241	1	Girls Room Gr4	5	5	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,760	0.27	0.11	0.16	470	194	276
Roosevelt Schools NY	Roosevelt High School	242	1	Girls Room Gr4	1	1	0.0280	0.0130	CF PL 26w, EM	LED Retrofit Can Kit, 6 Inch, NLO	1,760	0.03	0.01	0.02	49	23	26
Roosevelt Schools NY	Roosevelt High School	243	1	Custodian Closet B144	1	1	0.0200	0.0090	CF PL 18w	LED Wall Jar, 1,000 Lumen	600	0.02	0.01	0.01	12	5	7
Roosevelt Schools NY	Roosevelt High School	244	1	Boys Room Br4	5	5	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,760	0.27	0.11	0.16	470	194	276
Roosevelt Schools NY	Roosevelt High School	245	1	Boys Room Br4	1	1	0.0280	0.0130	CF PL 26w, EM	LED Retrofit Can Kit, 6 Inch, NLO	1,760	0.03	0.01	0.02	49	23	26
Roosevelt Schools NY	Roosevelt High School	246	1	Classroom B140	20	20	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	1.07	0.44	0.63	2,263	932	1,331
Roosevelt Schools NY	Roosevelt High School	247	1	Classroom B142	16	16	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.85	0.35	0.50	1,810	746	1,065
Roosevelt Schools NY	Roosevelt High School	248	1	Hallways H5	19	19	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,000	1.01	0.42	0.60	3,044	1,254	1,790
Roosevelt Schools NY	Roosevelt High School	249	1	Hallways H5	11	11	0.0534	0.0220	1x4, 2-Lamp T8, EM	LED Int. Driver Lamps, (2) 4' Lamps	8,760	0.59	0.24	0.35	5,146	2,120	3,026
Roosevelt Schools NY	Roosevelt High School	250	1	Hallways H5	14	14	0.0280	0.0130	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	3,000	0.39	0.18	0.21	1,176	546	630
Roosevelt Schools NY	Roosevelt High School	251	1	Hallways H5	2	2	0.0280	0.0130	CF PL 26w, EM	LED Retrofit Can Kit, 6 Inch, NLO	3,000	0.06	0.03	0.03	168	78	90
Roosevelt Schools NY	Roosevelt High School	252	1	Hallways H5	3	3	-	-	Exit Sign - LED, BB	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt High School	253	1	Hallways H5	4	4	-	-	Exit Sign - LED, BB	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt High School	254	1	Hallways H6	6	6	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,000	0.32	0.13	0.19	961	396	565
Roosevelt Schools NY	Roosevelt High School	255	1	Hallways H6	4	4	0.0534	0.0220	1x4, 2-Lamp T8, EM	LED Int. Driver Lamps, (2) 4' Lamps	3,000	0.21	0.09	0.13	641	264	377
Roosevelt Schools NY	Roosevelt High School	256	1	Hallways H6	2	2	-	-	Exit Sign - LED, BB	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt High School	257	2	Server Room 3	2	2	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4, Jack Chain Mount	750	0.11	0.05	0.06	80	38	43
Roosevelt Schools NY	Roosevelt High School	258	1	Classroom C170	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.64	0.26	0.38	1,358	559	798
Roosevelt Schools NY	Roosevelt High School	259	1	Classroom C168	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.64	0.26	0.38	1,358	559	798
Roosevelt Schools NY	Roosevelt High School	260	1	Classroom C166	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.64	0.26	0.38	1,358	559	798
Roosevelt Schools NY	Roosevelt High School	261	1	Boys Room Br5	4	4	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,760	0.21	0.09	0.13	376	155	221
Roosevelt Schools NY	Roosevelt High School	262	1	Boys Room Br5	2	2	0.0280	0.0130	CF PL 26w, EM	LED Retrofit Can Kit, 6 Inch, NLO	1,760	0.06	0.03	0.03	99	46	53
Roosevelt Schools NY	Roosevelt High School	263	1	Electrical Room C162	1	1	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4, Jack Chain Mount	750	0.05	0.03	0.03	40	19	21
Roosevelt Schools NY	Roosevelt High School	264	1	Custodian Closet C160	1	1	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4	600	0.05	0.03	0.03	32	15	17

Roosevelt UFSD, NY
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ECM 1 - LED Lighting and Lighting Controls Upgrade
Lighting Line by Line

Site Name	Building Name	Index	Floor	Location	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Roosevelt Schools NY	Roosevelt High School	265	1	Girls Room Gr5	4	4	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,760	0.21	0.09	0.13	376	155	221
Roosevelt Schools NY	Roosevelt High School	266	1	Girls Room Gr5	2	2	0.0280	0.0130	CF PL 26w, EM	LED Retrofit Can Kit, 6 Inch, NLO	1,760	0.06	0.03	0.03	99	46	53
Roosevelt Schools NY	Roosevelt High School	267	1	Classroom C156	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.64	0.26	0.38	1,358	559	798
Roosevelt Schools NY	Roosevelt High School	268	1	Classroom C154	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.64	0.26	0.38	1,358	559	798
Roosevelt Schools NY	Roosevelt High School	269	1	Classroom C152	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.64	0.26	0.38	1,358	559	798
Roosevelt Schools NY	Roosevelt High School	270	1	Classroom C151	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.64	0.26	0.38	1,358	559	798
Roosevelt Schools NY	Roosevelt High School	271	1	Classroom C153	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.64	0.26	0.38	1,358	559	798
Roosevelt Schools NY	Roosevelt High School	272	1	Classroom C155	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.64	0.26	0.38	1,358	559	798
Roosevelt Schools NY	Roosevelt High School	273	1	Classroom C157	11	11	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.59	0.24	0.35	1,245	513	732
Roosevelt Schools NY	Roosevelt High School	274	1	Classroom C157a	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,079	0.05	0.02	0.03	111	46	65
Roosevelt Schools NY	Roosevelt High School	275	1	Classroom C159	11	11	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.59	0.24	0.35	1,245	513	732
Roosevelt Schools NY	Roosevelt High School	276	1	Classroom C161	11	11	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.59	0.24	0.35	1,245	513	732
Roosevelt Schools NY	Roosevelt High School	277	1	Classroom C163	11	11	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.59	0.24	0.35	1,245	513	732
Roosevelt Schools NY	Roosevelt High School	278	1	Classroom C165	11	11	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.59	0.24	0.35	1,245	513	732
Roosevelt Schools NY	Roosevelt High School	279	1	Hallways H7	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,750	0.64	0.26	0.38	2,403	990	1,413
Roosevelt Schools NY	Roosevelt High School	280	1	Hallways H7	6	6	0.0534	0.0220	1x4, 2-Lamp T8, EM	LED Int. Driver Lamps, (2) 4' Lamps	8,760	0.32	0.13	0.19	2,807	1,156	1,650
Roosevelt Schools NY	Roosevelt High School	281	1	Hallways H7	11	11	0.0280	0.0130	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	3,000	0.31	0.14	0.17	924	429	495
Roosevelt Schools NY	Roosevelt High School	282	1	Hallways H7	4	4	0.0280	0.0130	CF PL 26w, EM	LED Retrofit Can Kit, 6 Inch, NLO	3,000	0.11	0.05	0.06	336	156	180
Roosevelt Schools NY	Roosevelt High School	283	1	Hallways H7	3	3	-	-	Exit Sign - LED, BB	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt High School	284	1	Hallways H8	6	6	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,000	0.32	0.13	0.19	961	396	565
Roosevelt Schools NY	Roosevelt High School	285	1	Hallways H8	3	3	0.0534	0.0220	1x4, 2-Lamp T8, EM	LED Int. Driver Lamps, (2) 4' Lamps	3,000	0.16	0.07	0.09	481	198	283
Roosevelt Schools NY	Roosevelt High School	286	1	Hallways H8	3	3	-	-	Exit Sign - LED, BB	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt High School	287	1	Hallways H9	2	2	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,000	0.11	0.04	0.06	320	132	188
Roosevelt Schools NY	Roosevelt High School	288	1	Hallways H9	1	1	0.0534	0.0220	1x4, 2-Lamp T8, EM	LED Int. Driver Lamps, (2) 4' Lamps	3,000	0.05	0.02	0.03	160	66	94
Roosevelt Schools NY	Roosevelt High School	289	1	Hallways H9	1	1	-	-	Exit Sign - LED, BB	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt High School	290	1	Kitchen 027b	9	9	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,280	0.48	0.20	0.28	615	253	362
Roosevelt Schools NY	Roosevelt High School	291	1	Kitchen 027b	18	18	0.0280	0.0130	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	1,280	0.50	0.23	0.27	645	300	346
Roosevelt Schools NY	Roosevelt High School	292	1	Kitchen 027b	25	25	0.0450	0.0450	Ceramic MH 39w	will Not be Retrofit	1,280	1.13	1.13	-	1,440	1,440	-
Roosevelt Schools NY	Roosevelt High School	293	1	Kitchen 027b Oven Hood	4	4	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,280	0.21	0.09	0.13	273	113	161
Roosevelt Schools NY	Roosevelt High School	294	1	Kitchen 027b	1	1	-	-	Exit Sign - LED, BB	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt High School	295	1	Kitchen 027b	9	9	0.1057	0.0440	2x4, 4-Lamp T8	LED Int. Driver Lamps, (4) 4' Lamps	1,280	0.95	0.40	0.56	1,218	507	711
Roosevelt Schools NY	Roosevelt High School	296	1	Kitchen 027b Oven Hood	4	4	0.0445	0.0220	1x3, 2-Lamp T8	LED Int. Driver Lamps, (2) 3' Lamps	1,280	0.18	0.09	0.09	228	113	115
Roosevelt Schools NY	Roosevelt High School	297	1	Storage 027c	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,280	0.05	0.02	0.03	68	28	40
Roosevelt Schools NY	Roosevelt High School	298	1	Storage 027d	1	1	0.0795	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	1,280	0.08	0.03	0.05	102	42	60

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Roosevelt Schools NY	Roosevelt High School	299	1	Office 027e	2	2	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	4,000	0.11	0.05	0.06	427	192	235
Roosevelt Schools NY	Roosevelt High School	300	1	Walk-in Cooler	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XL	750	0.05	0.02	0.03	40	17	24
Roosevelt Schools NY	Roosevelt High School	301	1	Walk-in Freezer	2	2	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XL	750	0.11	0.04	0.06	80	33	47
Roosevelt Schools NY	Roosevelt High School	302	1	Cafeteria K27	42	42	0.0273	0.0110	1x4, 1-Lamp T8	LED Int. Driver Lamp, (1) 4' Lamp	5,725	1.15	0.46	0.68	6,564	2,645	3,919
Roosevelt Schools NY	Roosevelt High School	303	1	Cafeteria K27	35	35	0.0380	0.0145	1x4, 1-Lamp T5E	LED Int. Driver Lamp, (1) 4' T5 HE Lamp	5,725	1.33	0.51	0.82	7,614	2,905	4,709
Roosevelt Schools NY	Roosevelt High School	304	1	Receiving 029	24	24	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4, Jack Chain Mount	600	1.28	0.60	0.68	769	360	409
Roosevelt Schools NY	Roosevelt High School	305	1	Fire Sprinkler Room	2	2	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4, Jack Chain Mount	600	0.11	0.05	0.06	64	30	34
Roosevelt Schools NY	Roosevelt High School	306	1	Receiving Office 029a	1	1	0.0795	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	1,760	0.08	0.03	0.05	140	58	82
Roosevelt Schools NY	Roosevelt High School	307	1	Receiving Office 029b	1	1	0.0795	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	1,760	0.08	0.03	0.05	140	58	82
Roosevelt Schools NY	Roosevelt High School	308	1	Hallways H10	4	4	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,000	0.21	0.09	0.13	641	264	377
Roosevelt Schools NY	Roosevelt High School	309	1	Hallways H10	3	3	0.0534	0.0220	1x4, 2-Lamp T8, EM	LED Int. Driver Lamps, (2) 4' Lamps	3,000	0.16	0.07	0.09	481	198	283
Roosevelt Schools NY	Roosevelt High School	310	1	Hallways H10	2	2	-	-	Exit Sign - LED, BB	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt High School	311	1	Hallways H11	3	3	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,000	0.16	0.07	0.09	481	198	283
Roosevelt Schools NY	Roosevelt High School	312	1	Hallways H11	14	14	0.0280	0.0130	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	1,760	0.39	0.18	0.21	690	320	370
Roosevelt Schools NY	Roosevelt High School	313	1	Hallways H11	8	8	0.0280	0.0130	CF PL 26w, EM	LED Retrofit Can Kit, 6 Inch, NLO	1,760	0.22	0.10	0.12	394	183	211
Roosevelt Schools NY	Roosevelt High School	314	1	Hallways H11	6	6	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,760	0.37	0.15	0.22	655	264	391
Roosevelt Schools NY	Roosevelt High School	315	1	Hallways H11	15	15	0.0860	0.0270	CF PL (2) 42w	LED Retrofit Can Kit, 10 Inch, HLO, HI	1,760	1.29	0.41	0.89	2,270	713	1,558
Roosevelt Schools NY	Roosevelt High School	316	1	Hallways H11	6	6	0.0200	0.0070	CF PL 18w	LED Retrofit Can Kit, 4 Inch, NLO	1,760	0.12	0.04	0.08	211	74	137
Roosevelt Schools NY	Roosevelt High School	317	1	Hallways H11	3	3	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt High School	318	1	Hallways H11 Display Case	3	3	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	3,750	0.19	0.08	0.11	698	281	416
Roosevelt Schools NY	Roosevelt High School	319	1	Hallways H11 Display Case	3	3	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,750	0.16	0.07	0.09	601	248	353
Roosevelt Schools NY	Roosevelt High School	320	1	Boys Room Br5	4	4	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,760	0.21	0.09	0.13	376	155	221
Roosevelt Schools NY	Roosevelt High School	321	1	Boys Room Br5	1	1	0.0500	0.0160	1x2, 2-Lamp T12, EM	LED Int. Driver Lamps, (2) 2' Lamps	1,760	0.05	0.02	0.03	88	28	60
Roosevelt Schools NY	Roosevelt High School	322	1	Custodian Closet Jc6	1	1	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4, Jack Chain Mount	600	0.05	0.03	0.03	32	15	17
Roosevelt Schools NY	Roosevelt High School	323	1	Girls Room Gr4	4	4	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,760	0.21	0.09	0.13	376	155	221
Roosevelt Schools NY	Roosevelt High School	324	1	Girls Room Gr4	1	1	0.0280	0.0130	CF PL 26w, EM	LED Retrofit Can Kit, 6 Inch, NLO	1,760	0.03	0.01	0.02	49	23	26
Roosevelt Schools NY	Roosevelt High School	325	1	Lobby	3	3	0.0280	0.0130	CF PL 26w, EM	LED Retrofit Can Kit, 6 Inch, NLO	1,760	0.08	0.04	0.05	148	69	79
Roosevelt Schools NY	Roosevelt High School	326	1	Lobby	6	6	0.0280	0.0130	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	1,760	0.17	0.08	0.09	296	137	158
Roosevelt Schools NY	Roosevelt High School	327	1	Lobby	2	2	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt High School	328	1	Foyer 2 Fo2	3	3	0.0280	0.0130	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	1,760	0.08	0.04	0.05	148	69	79
Roosevelt Schools NY	Roosevelt High School	329	1	Elevator Room	2	2	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4, Jack Chain Mount	750	0.11	0.05	0.06	80	38	43
Roosevelt Schools NY	Roosevelt High School	330	1	Open Office 010	30	30	0.0280	0.0130	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	3,200	0.84	0.39	0.45	2,688	1,248	1,440
Roosevelt Schools NY	Roosevelt High School	331	1	Office 010a	2	2	0.0534	0.0240	2x4, 2-Lamp T8	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	600	0.11	0.05	0.06	64	29	35
Roosevelt Schools NY	Roosevelt High School	332	1	Office 010b	2	2	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.11	0.05	0.06	342	154	188

Roosevelt UFSD, NY
Exhibit D-5-1
ECM 1 - LED Lighting and Lighting Controls Upgrade
Lighting Line by Line

Site Name	Building Name	Index	Floor	Location	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Roosevelt Schools NY	Roosevelt High School	333	1	Office 010c	3	3	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.16	0.07	0.09	513	230	282
Roosevelt Schools NY	Roosevelt High School	334	1	Office 010d	6	6	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.32	0.14	0.18	1,025	461	564
Roosevelt Schools NY	Roosevelt High School	335	1	Office 010d1	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	704	0.05	0.02	0.03	38	15	22
Roosevelt Schools NY	Roosevelt High School	336	1	Office 010f	1	1	0.0795	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	704	0.08	0.03	0.05	56	23	33
Roosevelt Schools NY	Roosevelt High School	337	1	Boys Room Br6	4	4	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,760	0.21	0.09	0.13	376	155	221
Roosevelt Schools NY	Roosevelt High School	338	1	Boys Room Br6	1	1	0.0280	0.0130	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	1,760	0.03	0.01	0.02	49	23	26
Roosevelt Schools NY	Roosevelt High School	339	1	Girl's Room	4	4	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,760	0.21	0.09	0.13	376	155	221
Roosevelt Schools NY	Roosevelt High School	340	1	Girl's Room	1	1	0.0280	0.0130	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	704	0.03	0.01	0.02	20	9	11
Roosevelt Schools NY	Roosevelt High School	341	1	Open 0ffice 055	2	2	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.11	0.05	0.06	342	154	188
Roosevelt Schools NY	Roosevelt High School	342	1	Open 0ffice 055	3	3	0.0317	0.0160	2x2, 2-Lamp T8, BL	LED Type C Lamps, (2) 2' Lamp, LED Driver, Dimming	3,200	0.10	0.05	0.05	304	154	151
Roosevelt Schools NY	Roosevelt High School	343	1	0ffice 055a	2	2	0.0534	0.0280	2x4, 2-Lamp T8	LED Type C Lamps, (2) 4' Lamp, LED Driver	3,200	0.11	0.06	0.05	342	179	163
Roosevelt Schools NY	Roosevelt High School	344	1	0ffice 054	2	2	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.11	0.05	0.06	342	154	188
Roosevelt Schools NY	Roosevelt High School	345	1	0ffice 055b	2	2	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.11	0.05	0.06	342	154	188
Roosevelt Schools NY	Roosevelt High School	346	1	0ffice 058	4	4	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.21	0.10	0.12	684	307	376
Roosevelt Schools NY	Roosevelt High School	347	1	Open 0ffice 056	6	6	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.32	0.14	0.18	1,025	461	564
Roosevelt Schools NY	Roosevelt High School	348	1	0ffice 056a	4	4	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.21	0.10	0.12	684	307	376
Roosevelt Schools NY	Roosevelt High School	349	1	0ffice 056b	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	704	0.05	0.02	0.03	38	15	22
Roosevelt Schools NY	Roosevelt High School	350	1	0ffice 056a1	1	1	0.0280	0.0130	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	600	0.03	0.01	0.02	17	8	9
Roosevelt Schools NY	Roosevelt High School	351	1	Jc7 030	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.05	0.02	0.03	32	13	19
Roosevelt Schools NY	Roosevelt High School	352	1	Staff Room 062	4	4	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.21	0.10	0.12	684	307	376
Roosevelt Schools NY	Roosevelt High School	353	1	Open 0ffice 064	6	6	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.32	0.14	0.18	1,025	461	564
Roosevelt Schools NY	Roosevelt High School	354	1	Open 0ffice 064	2	2	0.0317	0.0160	2x2, 2-Lamp T8, BL	LED Type C Lamps, (2) 2' Lamp, LED Driver, Dimming	3,200	0.06	0.03	0.03	203	102	100
Roosevelt Schools NY	Roosevelt High School	355	1	0ffice 064d	6	6	0.0534	0.0280	2x4, 2-Lamp T8	LED Type C Lamps, (2) 4' Lamp, LED Driver	3,200	0.32	0.17	0.15	1,025	538	488
Roosevelt Schools NY	Roosevelt High School	356	1	0ffice 064c	2	2	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.11	0.05	0.06	342	154	188
Roosevelt Schools NY	Roosevelt High School	357	1	0ffice 064b	2	2	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.11	0.05	0.06	342	154	188
Roosevelt Schools NY	Roosevelt High School	358	1	0ffice 064c	2	2	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.11	0.05	0.06	342	154	188
Roosevelt Schools NY	Roosevelt High School	359	1	0ffice 064d	6	6	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.32	0.14	0.18	1,025	461	564
Roosevelt Schools NY	Roosevelt High School	360	1	Open 0ffice 066	6	6	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.32	0.14	0.18	1,025	461	564
Roosevelt Schools NY	Roosevelt High School	361	1	0ffice 066a	2	2	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.11	0.05	0.06	342	154	188
Roosevelt Schools NY	Roosevelt High School	362	1	0ffice 066b	4	4	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.21	0.10	0.12	684	307	376
Roosevelt Schools NY	Roosevelt High School	363	1	0ffice 066c	2	2	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.11	0.05	0.06	342	154	188
Roosevelt Schools NY	Roosevelt High School	364	1	0ffice 066d	1	1	0.0795	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	3,200	0.08	0.03	0.05	254	106	149
Roosevelt Schools NY	Roosevelt High School	365	1	0ffice 064e	1	1	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.05	0.02	0.03	171	77	94
Roosevelt Schools NY	Roosevelt High School	366	1	Open 0ffice 057	16	16	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.85	0.38	0.47	2,734	1,229	1,505

Roosevelt UFSD, NY
Exhibit D-5-1
ECM 1 - LED Lighting and Lighting Controls Upgrade
Lighting Line by Line

Site Name	Building Name	Index	Floor	Location	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Roosevelt Schools NY	Roosevelt High School	367	1	0ffice 057a	2	2	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.11	0.05	0.06	342	154	188
Roosevelt Schools NY	Roosevelt High School	368	1	0ffice 057b	1	1	0.0795	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	3,200	0.08	0.03	0.05	254	106	149
Roosevelt Schools NY	Roosevelt High School	369	1	0ffice 057c	6	6	0.0795	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	3,200	0.48	0.20	0.28	1,526	634	893
Roosevelt Schools NY	Roosevelt High School	370	1	0ffice 057d	2	2	0.0795	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	600	0.16	0.07	0.09	95	40	56
Roosevelt Schools NY	Roosevelt High School	371	1	0ffice 057d	2	2	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.11	0.05	0.06	342	154	188
Roosevelt Schools NY	Roosevelt High School	372	1	Open 0ffice 054	6	6	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.32	0.14	0.18	1,025	461	564
Roosevelt Schools NY	Roosevelt High School	373	1	0ffice 054a	2	2	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.11	0.05	0.06	342	154	188
Roosevelt Schools NY	Roosevelt High School	374	1	0ffice 054b	2	2	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.11	0.05	0.06	342	154	188
Roosevelt Schools NY	Roosevelt High School	375	1	0ffice 054c	2	2	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.11	0.05	0.06	342	154	188
Roosevelt Schools NY	Roosevelt High School	376	1	Open 0ffice 053	2	2	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.11	0.05	0.06	342	154	188
Roosevelt Schools NY	Roosevelt High School	377	1	Open 0ffice 053	1	1	0.0317	0.0160	2x2, 2-Lamp T8, BL, EM	LED Type C Lamps, (2) 2' Lamp, LED Driver, Dimming	3,200	0.03	0.02	0.02	101	51	50
Roosevelt Schools NY	Roosevelt High School	378	1	0ffice 053a	3	3	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.16	0.07	0.09	513	230	282
Roosevelt Schools NY	Roosevelt High School	379	1	0ffice 053b	4	4	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.21	0.10	0.12	684	307	376
Roosevelt Schools NY	Roosevelt High School	380	1	0ffice 053c	4	4	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.21	0.10	0.12	684	307	376
Roosevelt Schools NY	Roosevelt High School	381	1	Open 0ffice 051	2	2	0.0317	0.0160	2x2, 2-Lamp T8, BL	LED Type C Lamps, (2) 2' Lamp, LED Driver, Dimming	3,200	0.06	0.03	0.03	203	102	100
Roosevelt Schools NY	Roosevelt High School	382	1	Open 0ffice 051	4	4	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.21	0.10	0.12	684	307	376
Roosevelt Schools NY	Roosevelt High School	383	1	Open 0ffice 051	4	4	0.0280	0.0130	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	3,200	0.11	0.05	0.06	358	166	192
Roosevelt Schools NY	Roosevelt High School	384	1	0ffice 051b	1	1	0.0280	0.0130	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	3,200	0.03	0.01	0.02	90	42	48
Roosevelt Schools NY	Roosevelt High School	385	1	0ffice 051 Exam1	2	2	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.11	0.05	0.06	342	154	188
Roosevelt Schools NY	Roosevelt High School	386	1	Office Np	1	1	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.05	0.02	0.03	171	77	94
Roosevelt Schools NY	Roosevelt High School	387	1	Social Work	2	2	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.11	0.05	0.06	342	154	188
Roosevelt Schools NY	Roosevelt High School	388	1	Telcom 2	1	1	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4, Jack Chain Mount	750	0.05	0.03	0.03	40	19	21
Roosevelt Schools NY	Roosevelt High School	389	1	Electrical Room 019	1	1	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4, Jack Chain Mount	750	0.05	0.03	0.03	40	19	21
Roosevelt Schools NY	Roosevelt High School	390	1	Boys Room Br8	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,760	0.05	0.02	0.03	94	39	55
Roosevelt Schools NY	Roosevelt High School	391	1	Open 0ffice 015	6	6	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.32	0.14	0.18	1,025	461	564
Roosevelt Schools NY	Roosevelt High School	392	1	0ffice 015a	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,200	0.05	0.02	0.03	171	70	100
Roosevelt Schools NY	Roosevelt High School	393	1	0ffice 015c	2	2	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.11	0.05	0.06	342	154	188
Roosevelt Schools NY	Roosevelt High School	394	1	0ffice 015b	2	2	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.11	0.05	0.06	342	154	188
Roosevelt Schools NY	Roosevelt High School	395	1	0ffice 015d	2	2	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.11	0.05	0.06	342	154	188
Roosevelt Schools NY	Roosevelt High School	396	1	0ffice 015e	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,200	0.05	0.02	0.03	171	70	100
Roosevelt Schools NY	Roosevelt High School	397	1	Girls Room Br8	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,760	0.05	0.02	0.03	94	39	55
Roosevelt Schools NY	Roosevelt High School	398	1	Hallways H12	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,000	0.64	0.26	0.38	1,922	792	1,130
Roosevelt Schools NY	Roosevelt High School	399	1	Hallways H12	7	7	0.0534	0.0220	1x4, 2-Lamp T8, EM	LED Int. Driver Lamps, (2) 4' Lamps	8,760	0.37	0.15	0.22	3,274	1,349	1,925
Roosevelt Schools NY	Roosevelt High School	400	1	Hallways H12	2	2	0.0280	0.0130	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	3,000	0.06	0.03	0.03	168	78	90

Roosevelt UFSD, NY
Exhibit D-5-1
ECM 1 - LED Lighting and Lighting Controls Upgrade
Lighting Line by Line

Site Name	Building Name	Index	Floor	Location	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Roosevelt Schools NY	Roosevelt High School	401	1	Hallways H12	3	3	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt High School	402	1	Classroom 014	17	17	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.91	0.37	0.53	1,924	793	1,131
Roosevelt Schools NY	Roosevelt High School	403	1	Classroom 016	17	17	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.91	0.37	0.53	1,924	793	1,131
Roosevelt Schools NY	Roosevelt High School	404	1	Classroom 016a	3	3	0.0795	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	2,119	0.24	0.10	0.14	505	210	296
Roosevelt Schools NY	Roosevelt High School	405	1	Classroom 016a	1	1	0.0795	0.0330	2x4, 3-Lamp T8, EM	LED Int. Driver Lamps, (3) 4' Lamps	2,119	0.08	0.03	0.05	168	70	99
Roosevelt Schools NY	Roosevelt High School	406	1	Classroom 016b	5	5	0.0795	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	2,119	0.40	0.17	0.23	842	350	493
Roosevelt Schools NY	Roosevelt High School	407	1	Electrical Room 020	2	2	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4, Jack Chain Mount	750	0.11	0.05	0.06	80	38	43
Roosevelt Schools NY	Roosevelt High School	408	1	Classroom 022	11	11	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.59	0.24	0.35	1,245	513	732
Roosevelt Schools NY	Roosevelt High School	409	1	Classroom 022	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.64	0.26	0.38	1,358	559	798
Roosevelt Schools NY	Roosevelt High School	410	1	Classroom 022	1	1	0.0280	0.0130	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	2,119	0.03	0.01	0.02	59	28	32
Roosevelt Schools NY	Roosevelt High School	411	1	Classroom 024	2	2	0.0795	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	2,119	0.16	0.07	0.09	337	140	197
Roosevelt Schools NY	Roosevelt High School	412	1	Custodian Locker Room	6	6	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	750	0.32	0.13	0.19	240	99	141
Roosevelt Schools NY	Roosevelt High School	413	1	Custodian Locker Room	1	1	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt High School	414	1	Custodian Bathroom	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	750	0.05	0.02	0.03	40	17	24
Roosevelt Schools NY	Roosevelt High School	415	1	Noc Room	6	6	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	750	0.32	0.13	0.19	240	99	141
Roosevelt Schools NY	Roosevelt High School	416	1	Noc Room	2	2	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.11	0.05	0.06	342	154	188
Roosevelt Schools NY	Roosevelt High School	417	1	Noc Room	2	2	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.11	0.05	0.06	342	154	188
Roosevelt Schools NY	Roosevelt High School	418	1	Noc Room	9	9	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.48	0.22	0.26	1,538	691	847
Roosevelt Schools NY	Roosevelt High School	419	1	Noc Room	3	3	0.0317	0.0160	2x2, 2-Lamp T8, BL	LED Type C Lamps, (2) 2' Lamp, LED Driver, Dimming	3,200	0.10	0.05	0.05	304	154	151
Roosevelt Schools NY	Roosevelt High School	420	1	Classroom 034	20	20	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	1.07	0.44	0.63	2,263	932	1,331
Roosevelt Schools NY	Roosevelt High School	421	1	Weightroom 036	18	18	0.0795	0.0330	1x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	2,119	1.43	0.59	0.84	3,032	1,259	1,774
Roosevelt Schools NY	Roosevelt High School	422	1	Weightroom 036	2	2	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt High School	423	1	Weightroom 036a	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,119	0.05	0.02	0.03	113	47	67
Roosevelt Schools NY	Roosevelt High School	424	1	0ffice 038	2	2	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.11	0.05	0.06	342	154	188
Roosevelt Schools NY	Roosevelt High School	425	1	0ffice 038	1	1	0.0317	0.0160	2x2, 2-Lamp T8, BL	LED Type C Lamps, (2) 2' Lamp, LED Driver, Dimming	3,200	0.03	0.02	0.02	101	51	50
Roosevelt Schools NY	Roosevelt High School	426	1	0ffice 038e	1	1	0.0534	0.0220	2x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,200	0.05	0.02	0.03	171	70	100
Roosevelt Schools NY	Roosevelt High School	427	1	0ffice 038b	2	2	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.11	0.05	0.06	342	154	188
Roosevelt Schools NY	Roosevelt High School	428	1	0ffice 038d	4	4	0.0534	0.0240	2x4, 2-Lamp T8, BL	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	3,200	0.21	0.10	0.12	684	307	376
Roosevelt Schools NY	Roosevelt High School	429	1	0ffice 038c	2	2	0.0534	0.0220	2x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,200	0.11	0.04	0.06	342	141	201
Roosevelt Schools NY	Roosevelt High School	430	1	Bathroom 038t	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,200	0.05	0.02	0.03	171	70	100
Roosevelt Schools NY	Roosevelt High School	431	1	Annx Gym 040	24	24	0.4560	0.1420	(8) CF PL 70w	LED High Bay, 20K Lumens, 2x2, OSF, WG, HCP	3,832	10.94	3.41	7.54	41,937	13,059	28,878
Roosevelt Schools NY	Roosevelt High School	432	1	Annx Gym 040	4	4	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt High School	433	1	Annx Gym 040	4	4	0.0500	0.0500	Frog Eyes	will Not be Retrofit	8,760	0.20	0.20	-	1,752	1,752	-
Roosevelt Schools NY	Roosevelt High School	434	1	Annx Gym 040a	7	7	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,221	0.37	0.15	0.22	1,204	496	708

Roosevelt UFSD, NY
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Site Name	Building Name	Index	Floor	Location	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Roosevelt Schools NY	Roosevelt High School	435	1	Electrical Room 042	1	1	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4, Jack Chain Mount	750	0.05	0.03	0.03	40	19	21
Roosevelt Schools NY	Roosevelt High School	436	1	Hallways H13	4	4	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,000	0.21	0.09	0.13	641	264	377
Roosevelt Schools NY	Roosevelt High School	437	1	Hallways H13	3	3	0.0534	0.0220	1x4, 2-Lamp T8, EM	LED Int. Driver Lamps, (2) 4' Lamps	8,760	0.16	0.07	0.09	1,403	578	825
Roosevelt Schools NY	Roosevelt High School	438	1	Hallways H13	2	2	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt High School	439	1	Hallway Closet	6	6	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	750	0.32	0.13	0.19	240	99	141
Roosevelt Schools NY	Roosevelt High School	440	1	Girl's Lockerroom 045	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,760	0.64	0.26	0.38	1,128	465	663
Roosevelt Schools NY	Roosevelt High School	441	1	Girl's Lockerroom045	2	2	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt High School	442	1	Girl's Lockerroomo45c	2	2	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,760	0.11	0.04	0.06	188	77	111
Roosevelt Schools NY	Roosevelt High School	443	1	Girl's Lockerroomo45d	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,760	0.05	0.02	0.03	94	39	55
Roosevelt Schools NY	Roosevelt High School	444	1	Girl's Lockerroomo45b	4	4	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,760	0.21	0.09	0.13	376	155	221
Roosevelt Schools NY	Roosevelt High School	445	1	Girl's Lockerroom 045a	2	2	0.0795	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	1,760	0.16	0.07	0.09	280	116	164
Roosevelt Schools NY	Roosevelt High School	446	1	Boy's Lockerroom 039a	2	2	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,760	0.11	0.04	0.06	188	77	111
Roosevelt Schools NY	Roosevelt High School	447	1	Boy's Lockerroom 039a	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,760	0.05	0.02	0.03	94	39	55
Roosevelt Schools NY	Roosevelt High School	448	1	Boy's Lockerroom 039a	12	12	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,760	0.64	0.26	0.38	1,128	465	663
Roosevelt Schools NY	Roosevelt High School	449	1	Boy's Lockerroom 039a	2	2	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt High School	450	1	Gym 033	36	36	0.4560	0.1670	(8) CF PL 70w	LED High Bay, 25K Lumens, 2x2, OSF, WG, HCP	3,832	16.42	6.01	10.40	62,906	23,038	39,868
Roosevelt Schools NY	Roosevelt High School	451	1	Gym 033	4	4	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt High School	452	1	Gym 033	4	4	0.0500	0.0500	Frog Eyes	will Not be Retrofit	8,760	0.20	0.20	-	1,752	1,752	-
Roosevelt Schools NY	Roosevelt High School	453	1	Gym 033	7	7	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,221	0.37	0.15	0.22	1,204	496	708
Roosevelt Schools NY	Roosevelt High School	454	1	Gym 033	4	4	0.0500	0.0500	Frog Eyes	will Not be Retrofit	8,760	0.20	0.20	-	1,752	1,752	-
Roosevelt Schools NY	Roosevelt High School	455	1	Girl's Room	3	3	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,760	0.16	0.07	0.09	282	116	166
Roosevelt Schools NY	Roosevelt High School	456	1	Girl's Room	1	1	0.0280	0.0130	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	1,760	0.03	0.01	0.02	49	23	26
Roosevelt Schools NY	Roosevelt High School	457	1	Jc036b	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	750	0.05	0.02	0.03	40	17	24
Roosevelt Schools NY	Roosevelt High School	458	1	Boy's Room	3	3	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,760	0.16	0.07	0.09	282	116	166
Roosevelt Schools NY	Roosevelt High School	459	1	Boy's Room	1	1	0.0280	0.0130	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	1,760	0.03	0.01	0.02	49	23	26
Roosevelt Schools NY	Roosevelt High School	460	1	Office 041	2	2	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,200	0.11	0.04	0.06	235	97	138
Roosevelt Schools NY	Roosevelt High School	461	1	Office 041a	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,200	0.05	0.02	0.03	117	48	69
Roosevelt Schools NY	Roosevelt High School	462	1	Office 042	2	2	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,200	0.11	0.04	0.06	235	97	138
Roosevelt Schools NY	Roosevelt High School	463	1	Office 042a	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,200	0.05	0.02	0.03	117	48	69
Roosevelt Schools NY	Roosevelt High School	464	1	Outside Girl's Room	2	2	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,750	0.11	0.04	0.06	401	165	236
Roosevelt Schools NY	Roosevelt High School	465	1	Outside Boy's Room	2	2	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,750	0.11	0.04	0.06	401	165	236
Roosevelt Schools NY	Roosevelt High School	466	1	Hallways H14 By Main Gym	80	80	0.0273	0.0110	1x4, 1-Lamp T8	LED Int. Driver Lamp, (1) 4' Lamp, XL	3,000	2.18	0.88	1.30	6,552	2,640	3,912
Roosevelt Schools NY	Roosevelt High School	467	1	Hallways H14 By Main Gym	18	18	0.0280	0.0130	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	3,000	0.50	0.23	0.27	1,512	702	810
Roosevelt Schools NY	Roosevelt High School	468	1	Hallways H14 By Main Gym	4	4	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-

Roosevelt UFSD, NY
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Site Name	Building Name	Index	Floor	Location	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Roosevelt Schools NY	Roosevelt High School	469	1	Hallway Display Case 2	12	12	0.0380	0.0145	1x4, 1-Lamp T5E	LED Int. Driver Lamp, (1) 4' T5 HE Lamp	3,750	0.46	0.17	0.28	1,710	653	1,058
Roosevelt Schools NY	Roosevelt High School	470	1	Hallway Display Case 2	24	24	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,750	1.28	0.53	0.75	4,806	1,980	2,826
Roosevelt Schools NY	Roosevelt High School	471	1	Boy's Locker Room 026	13	13	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,760	0.69	0.29	0.41	1,222	503	718
Roosevelt Schools NY	Roosevelt High School	472	1	Boy's Locker Room 026a	2	2	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,760	0.11	0.04	0.06	188	77	111
Roosevelt Schools NY	Roosevelt High School	473	1	Girl's Locker Room 028	13	13	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,760	0.69	0.29	0.41	1,222	503	718
Roosevelt Schools NY	Roosevelt High School	474	1	Girl's Locker Room 028a	2	2	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,760	0.11	0.04	0.06	188	77	111
Roosevelt Schools NY	Roosevelt High School	475	B	Basement	87	87	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4, Jack Chain Mount	750	4.65	2.18	2.47	3,484	1,631	1,853
Roosevelt Schools NY	Roosevelt High School	476	B	Basement	21	21	0.0130	0.0060	CFL 13w	LED Lamp, A-Line, LLO	750	0.27	0.13	0.15	205	95	110
Roosevelt Schools NY	Roosevelt High School	477	Roof	Mechanical 2-rooftop	4	4	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4, Jack Chain Mount	750	0.21	0.10	0.11	160	75	85
Roosevelt Schools NY	Roosevelt High School	478	Ext	Site Lighting EXT	18	18	0.1800	0.0750	MH 150w	LED Shoebox, 10,000 Lumens, Type IV W, PC, AM, GRY	4,380	3.24	1.35	1.89	14,191	5,913	8,278
Roosevelt Schools NY	Roosevelt High School	479	Ext	Site Lighting Ext	1	1	0.2900	0.1000	MH 250w	LED Shoebox, 12,000 Lumens, Type IV W, PC, AM, GRY	4,380	0.29	0.10	0.19	1,270	438	832
Roosevelt Schools NY	Roosevelt High School	480	1	New Layout	92	92	-	-	New Layout	No Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt High School	481	0	New Layout	29	29	-	-	New Layout	No Retrofit	4,380	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt Middle School	1	3	Office	1	1	0.0360	0.0090	CF PL 32w	LED Retrofit Can Kit, 6 Inch, NLO	2,200	0.04	0.01	0.03	79	20	59
Roosevelt Schools NY	Roosevelt Middle School	2	3	Office	1	1	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt Middle School	3	3	Office	9	9	0.0710	0.0350	2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	1,760	0.64	0.32	0.32	1,125	554	570
Roosevelt Schools NY	Roosevelt Middle School	4	3	Office	2	2	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	2,200	0.07	0.02	0.05	158	53	106
Roosevelt Schools NY	Roosevelt Middle School	5	3	Conference Room	6	6	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,000	0.33	0.13	0.20	330	132	198
Roosevelt Schools NY	Roosevelt Middle School	6	3	Conference Room	2	2	0.0355	0.0130	A 1-Lamp 40 Biax	LED Int. Driver Lamp, (1) 40w BX EQ	1,000	0.07	0.03	0.05	71	26	45
Roosevelt Schools NY	Roosevelt Middle School	7	3	Office	2	2	0.0550	0.0220	2x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,000	0.11	0.04	0.07	220	88	132
Roosevelt Schools NY	Roosevelt Middle School	8	3	Office	1	1	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt Middle School	9	3	Storage	1	1	0.0550	0.0220	2x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	750	0.06	0.02	0.03	41	17	25
Roosevelt Schools NY	Roosevelt Middle School	10	3	Bathroom	1	1	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	1,760	0.04	0.01	0.02	63	21	42
Roosevelt Schools NY	Roosevelt Middle School	11	3	Bathroom	1	1	0.0320	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	1,760	0.03	0.02	0.02	56	28	28
Roosevelt Schools NY	Roosevelt Middle School	12	3	Office	2	2	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	1,760	0.16	0.07	0.10	289	116	172
Roosevelt Schools NY	Roosevelt Middle School	13	3	Office	2	2	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	1,760	0.16	0.07	0.10	289	116	172
Roosevelt Schools NY	Roosevelt Middle School	14	3	Office	2	2	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	1,760	0.16	0.07	0.10	289	116	172
Roosevelt Schools NY	Roosevelt Middle School	15	3	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	16	3	Classroom	3	3	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.11	0.04	0.07	88	29	59
Roosevelt Schools NY	Roosevelt Middle School	17	3	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	18	3	Classroom	3	3	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.11	0.04	0.07	88	29	59
Roosevelt Schools NY	Roosevelt Middle School	19	3	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	20	3	Classroom	3	3	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.11	0.04	0.07	88	29	59
Roosevelt Schools NY	Roosevelt Middle School	21	3	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324

Roosevelt UFSD, NY
Exhibit D-5-1
ECM 1 - LED Lighting and Lighting Controls Upgrade
Lighting Line by Line

Site Name	Building Name	Index	Floor	Location	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Roosevelt Schools NY	Roosevelt Middle School	22	3	Classroom	3	3	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.11	0.04	0.07	88	29	59
Roosevelt Schools NY	Roosevelt Middle School	23	3	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	24	3	Classroom	3	3	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.11	0.04	0.07	88	29	59
Roosevelt Schools NY	Roosevelt Middle School	25	3	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	26	3	Classroom	3	3	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.11	0.04	0.07	88	29	59
Roosevelt Schools NY	Roosevelt Middle School	27	3	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	28	3	Classroom	1	1	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.04	0.01	0.02	29	10	20
Roosevelt Schools NY	Roosevelt Middle School	29	3	Office	2	2	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	1,760	0.16	0.07	0.10	289	116	172
Roosevelt Schools NY	Roosevelt Middle School	30	3	Storage	5	5	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	2,200	0.28	0.11	0.17	605	242	363
Roosevelt Schools NY	Roosevelt Middle School	31	3	Bathroom, Men's	4	4	0.0360	0.0090	CF PL 32w	LED Retrofit Can Kit, 6 Inch, NLO	1,760	0.14	0.04	0.11	253	63	190
Roosevelt Schools NY	Roosevelt Middle School	32	3	Bathroom, Men's	4	4	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XL	1,760	0.22	0.09	0.13	387	155	232
Roosevelt Schools NY	Roosevelt Middle School	33	3	Bathroom, Men's	1	1	0.0450	0.0220	1x3, 2-Lamp T8	LED Int. Driver Lamps, (2) 3' Lamps, XL	1,760	0.05	0.02	0.02	79	39	40
Roosevelt Schools NY	Roosevelt Middle School	34	3	Jc	1	1	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	750	0.06	0.02	0.03	41	17	25
Roosevelt Schools NY	Roosevelt Middle School	35	3	Bathroom, Women's	4	4	0.0360	0.0090	CF PL 32w	LED Retrofit Can Kit, 6 Inch, NLO	1,760	0.14	0.04	0.11	253	63	190
Roosevelt Schools NY	Roosevelt Middle School	36	3	Bathroom, Women's	4	4	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XL	1,760	0.22	0.09	0.13	387	155	232
Roosevelt Schools NY	Roosevelt Middle School	37	3	Bathroom, Women's	1	1	0.0450	0.0220	1x3, 2-Lamp T8	LED Int. Driver Lamps, (2) 3' Lamps, XL	1,760	0.05	0.02	0.02	79	39	40
Roosevelt Schools NY	Roosevelt Middle School	38	3	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	39	3	Classroom	1	1	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.04	0.01	0.02	29	10	20
Roosevelt Schools NY	Roosevelt Middle School	40	3	Bathroom	1	1	0.0360	0.0090	CF PL 32w	LED Retrofit Can Kit, 6 Inch, NLO	1,760	0.04	0.01	0.03	63	16	48
Roosevelt Schools NY	Roosevelt Middle School	41	3	Bathroom	1	1	0.0320	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	1,760	0.03	0.02	0.02	56	28	28
Roosevelt Schools NY	Roosevelt Middle School	42	3	Closet	1	1	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.06	0.02	0.03	33	13	20
Roosevelt Schools NY	Roosevelt Middle School	43	3	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	44	3	Classroom	3	3	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.11	0.04	0.07	88	29	59
Roosevelt Schools NY	Roosevelt Middle School	45	3	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	46	3	Classroom	3	3	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.11	0.04	0.07	88	29	59
Roosevelt Schools NY	Roosevelt Middle School	47	3	Breakroom	8	8	0.0710	0.0350	2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	2,000	0.57	0.28	0.29	1,136	560	576
Roosevelt Schools NY	Roosevelt Middle School	48	3	Breakroom	5	5	0.0360	0.0090	CF PL 32w	LED Retrofit Can Kit, 6 Inch, NLO	2,000	0.18	0.05	0.14	360	90	270
Roosevelt Schools NY	Roosevelt Middle School	49	3	Breakroom Task Lighting	5	5	0.0280	0.0110	1x4, 1-Lamp T8	LED Int. Driver Lamp, (1) 4' Lamp	2,000	0.14	0.06	0.09	280	110	170
Roosevelt Schools NY	Roosevelt Middle School	50	3	Bathroom	1	1	0.0360	0.0090	CF PL 32w	LED Retrofit Can Kit, 6 Inch, NLO	1,760	0.04	0.01	0.03	63	16	48
Roosevelt Schools NY	Roosevelt Middle School	51	3	Bathroom	1	1	0.0320	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	1,760	0.03	0.02	0.02	56	28	28
Roosevelt Schools NY	Roosevelt Middle School	52	3	Office	2	2	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	1,760	0.16	0.07	0.10	289	116	172
Roosevelt Schools NY	Roosevelt Middle School	53	3	Electrical Rm	2	2	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.11	0.04	0.07	66	26	40
Roosevelt Schools NY	Roosevelt Middle School	54	3	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	55	3	Classroom	2	2	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.07	0.02	0.05	59	20	39

Roosevelt UFSD, NY
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Roosevelt Schools NY	Roosevelt Middle School	56	3	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	57	3	Classroom	2	2	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.07	0.02	0.05	59	20	39
Roosevelt Schools NY	Roosevelt Middle School	58	3	Storage	2	2	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.11	0.04	0.07	66	26	40
Roosevelt Schools NY	Roosevelt Middle School	59	3	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	60	3	Classroom	2	2	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.07	0.02	0.05	59	20	39
Roosevelt Schools NY	Roosevelt Middle School	61	3	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	62	3	Classroom	3	3	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.11	0.04	0.07	88	29	59
Roosevelt Schools NY	Roosevelt Middle School	63	3	Prep Room	3	3	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	600	0.25	0.10	0.15	148	59	88
Roosevelt Schools NY	Roosevelt Middle School	64	3	It Rm	2	2	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.11	0.04	0.07	66	26	40
Roosevelt Schools NY	Roosevelt Middle School	65	3	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	66	3	Classroom	3	3	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.11	0.04	0.07	88	29	59
Roosevelt Schools NY	Roosevelt Middle School	67	3	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	68	3	Classroom	3	3	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.11	0.04	0.07	88	29	59
Roosevelt Schools NY	Roosevelt Middle School	69	3	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	70	3	Classroom	2	2	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.07	0.02	0.05	59	20	39
Roosevelt Schools NY	Roosevelt Middle School	71	3	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	72	3	Classroom	2	2	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.07	0.02	0.05	59	20	39
Roosevelt Schools NY	Roosevelt Middle School	73	3	Electrical Rm	2	2	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.11	0.04	0.07	66	26	40
Roosevelt Schools NY	Roosevelt Middle School	74	3	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	75	3	Classroom	2	2	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.07	0.02	0.05	59	20	39
Roosevelt Schools NY	Roosevelt Middle School	76	3	Classroom	8	8	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.44	0.18	0.26	360	144	216
Roosevelt Schools NY	Roosevelt Middle School	77	3	Classroom	1	1	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.04	0.01	0.02	29	10	20
Roosevelt Schools NY	Roosevelt Middle School	78	3	Office	1	1	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	1,760	0.08	0.03	0.05	144	58	86
Roosevelt Schools NY	Roosevelt Middle School	79	3	Office	1	1	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	1,760	0.08	0.03	0.05	144	58	86
Roosevelt Schools NY	Roosevelt Middle School	80	3	Storage	1	1	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	1,760	0.08	0.03	0.05	144	58	86
Roosevelt Schools NY	Roosevelt Middle School	81	3	Hallway	25	25	0.0710	0.0350	2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	3,000	1.78	0.88	0.90	5,325	2,625	2,700
Roosevelt Schools NY	Roosevelt Middle School	82	3	Hallway	35	35	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	3,000	1.26	0.42	0.84	3,780	1,260	2,520
Roosevelt Schools NY	Roosevelt Middle School	83	3	Hallway	7	7	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt Middle School	84	2	Open Office	1	1	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	2,000	0.08	0.03	0.05	164	66	98
Roosevelt Schools NY	Roosevelt Middle School	85	2	Open Office	1	1	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt Middle School	86	2	Open Office	8	8	0.0710	0.0350	2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	1,760	0.57	0.28	0.29	1,000	493	507
Roosevelt Schools NY	Roosevelt Middle School	87	2	Open Office	1	1	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt Middle School	88	2	Office	2	2	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	1,760	0.16	0.07	0.10	289	116	172
Roosevelt Schools NY	Roosevelt Middle School	89	2	Office	2	2	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	1,760	0.16	0.07	0.10	289	116	172

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Site Name	Building Name	Index	Floor	Location	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Roosevelt Schools NY	Roosevelt Middle School	90	2	Conference Rm	6	6	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	800	0.33	0.13	0.20	264	106	158
Roosevelt Schools NY	Roosevelt Middle School	91	2	Conference Rm	5	5	0.0355	0.0130	A 1-Lamp 40 Biax	LED Int. Driver Lamp, (1) 40w BX EQ	800	0.18	0.07	0.11	142	52	90
Roosevelt Schools NY	Roosevelt Middle School	92	2	Office	4	4	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	1,760	0.33	0.13	0.20	577	232	345
Roosevelt Schools NY	Roosevelt Middle School	93	2	Storage	4	4	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	600	0.33	0.13	0.20	197	79	118
Roosevelt Schools NY	Roosevelt Middle School	94	2	Bathroom	1	1	0.0360	0.0090	CF PL 32w	LED Retrofit Can Kit, 6 Inch, NLO	704	0.04	0.01	0.03	25	6	19
Roosevelt Schools NY	Roosevelt Middle School	95	2	Bathroom	1	1	0.0320	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	704	0.03	0.02	0.02	23	11	11
Roosevelt Schools NY	Roosevelt Middle School	96	2	Storage	1	1	0.0710	0.0350	2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	600	0.07	0.04	0.04	43	21	22
Roosevelt Schools NY	Roosevelt Middle School	97	2	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	98	2	Classroom	3	3	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.11	0.04	0.07	88	29	59
Roosevelt Schools NY	Roosevelt Middle School	99	2	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	100	2	Classroom	3	3	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.11	0.04	0.07	88	29	59
Roosevelt Schools NY	Roosevelt Middle School	101	2	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	102	2	Classroom	3	3	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.11	0.04	0.07	88	29	59
Roosevelt Schools NY	Roosevelt Middle School	103	2	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	104	2	Classroom	3	3	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.11	0.04	0.07	88	29	59
Roosevelt Schools NY	Roosevelt Middle School	105	2	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	106	2	Classroom	3	3	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.11	0.04	0.07	88	29	59
Roosevelt Schools NY	Roosevelt Middle School	107	2	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	108	2	Classroom	3	3	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.11	0.04	0.07	88	29	59
Roosevelt Schools NY	Roosevelt Middle School	109	2	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	110	2	Classroom	1	1	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.04	0.01	0.02	29	10	20
Roosevelt Schools NY	Roosevelt Middle School	111	2	Office	2	2	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	1,760	0.16	0.07	0.10	289	116	172
Roosevelt Schools NY	Roosevelt Middle School	112	2	Storage	5	5	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	2,500	0.28	0.11	0.17	688	275	413
Roosevelt Schools NY	Roosevelt Middle School	113	2	Bathroom, Men's	4	4	0.0360	0.0090	CF PL 32w	LED Retrofit Can Kit, 6 Inch, NLO	1,760	0.14	0.04	0.11	253	63	190
Roosevelt Schools NY	Roosevelt Middle School	114	2	Bathroom, Men's	4	4	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XL	1,760	0.22	0.09	0.13	387	155	232
Roosevelt Schools NY	Roosevelt Middle School	115	2	Bathroom, Men's	1	1	0.0450	0.0220	1x3, 2-Lamp T8	LED Int. Driver Lamps, (2) 3' Lamps, XL	1,760	0.05	0.02	0.02	79	39	40
Roosevelt Schools NY	Roosevelt Middle School	116	2	Jc	1	1	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	750	0.06	0.02	0.03	41	17	25
Roosevelt Schools NY	Roosevelt Middle School	117	2	Bathroom, Women's	4	4	0.0360	0.0090	CF PL 32w	LED Retrofit Can Kit, 6 Inch, NLO	1,760	0.14	0.04	0.11	253	63	190
Roosevelt Schools NY	Roosevelt Middle School	118	2	Bathroom, Women's	4	4	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XL	1,760	0.22	0.09	0.13	387	155	232
Roosevelt Schools NY	Roosevelt Middle School	119	2	Bathroom, Women's	1	1	0.0450	0.0220	1x3, 2-Lamp T8	LED Int. Driver Lamps, (2) 3' Lamps, XL	1,760	0.05	0.02	0.02	79	39	40
Roosevelt Schools NY	Roosevelt Middle School	120	2	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	121	2	Classroom	1	1	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.04	0.01	0.02	29	10	20
Roosevelt Schools NY	Roosevelt Middle School	122	2	Bathroom	1	1	0.0360	0.0090	CF PL 32w	LED Retrofit Can Kit, 6 Inch, NLO	1,760	0.04	0.01	0.03	63	16	48
Roosevelt Schools NY	Roosevelt Middle School	123	2	Bathroom	1	1	0.0320	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	1,760	0.03	0.02	0.02	56	28	28

Roosevelt UFSD, NY
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ECM 1 - LED Lighting and Lighting Controls Upgrade
Lighting Line by Line

Site Name	Building Name	Index	Floor	Location	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Roosevelt Schools NY	Roosevelt Middle School	124	2	Storage	1	1	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.06	0.02	0.03	33	13	20
Roosevelt Schools NY	Roosevelt Middle School	125	2	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	126	2	Classroom	3	3	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.11	0.04	0.07	88	29	59
Roosevelt Schools NY	Roosevelt Middle School	127	2	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	128	2	Classroom	3	3	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.11	0.04	0.07	88	29	59
Roosevelt Schools NY	Roosevelt Middle School	129	2	Breakroom	8	8	0.0710	0.0260	2-Lamp 40 Biax	LED Int. Driver Lamp, (2) 40w BX EQ	2,000	0.57	0.21	0.36	1,136	416	720
Roosevelt Schools NY	Roosevelt Middle School	130	2	Breakroom	5	5	0.0360	0.0090	CF PL 32w	LED Retrofit Can Kit, 6 Inch, NLO	2,000	0.18	0.05	0.14	360	90	270
Roosevelt Schools NY	Roosevelt Middle School	131	2	Breakroom Task Ligting	5	5	0.0280	0.0110	1x4, 1-Lamp T8	LED Int. Driver Lamp, (1) 4' Lamp	2,000	0.14	0.06	0.09	280	110	170
Roosevelt Schools NY	Roosevelt Middle School	132	2	Bathroom	1	1	0.0360	0.0090	CF PL 32w	LED Retrofit Can Kit, 6 Inch, NLO	1,760	0.04	0.01	0.03	63	16	48
Roosevelt Schools NY	Roosevelt Middle School	133	2	Bathroom	1	1	0.0320	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	1,760	0.03	0.02	0.02	56	28	28
Roosevelt Schools NY	Roosevelt Middle School	134	2	Office	2	2	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	2,000	0.16	0.07	0.10	328	132	196
Roosevelt Schools NY	Roosevelt Middle School	135	2	Electrical Rm	2	2	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.11	0.04	0.07	66	26	40
Roosevelt Schools NY	Roosevelt Middle School	136	2	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	137	2	Classroom	2	2	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.07	0.02	0.05	59	20	39
Roosevelt Schools NY	Roosevelt Middle School	138	2	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	139	2	Classroom	2	2	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.07	0.02	0.05	59	20	39
Roosevelt Schools NY	Roosevelt Middle School	140	2	Storage	1	1	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.06	0.02	0.03	33	13	20
Roosevelt Schools NY	Roosevelt Middle School	141	2	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	142	2	Classroom	2	2	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.07	0.02	0.05	59	20	39
Roosevelt Schools NY	Roosevelt Middle School	143	2	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	144	2	Classroom	3	3	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.11	0.04	0.07	88	29	59
Roosevelt Schools NY	Roosevelt Middle School	145	2	Storage	2	2	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	600	0.16	0.07	0.10	98	40	59
Roosevelt Schools NY	Roosevelt Middle School	146	2	Storage	2	2	0.0710	0.0350	2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	600	0.14	0.07	0.07	85	42	43
Roosevelt Schools NY	Roosevelt Middle School	147	2	It Rm	2	2	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.11	0.04	0.07	66	26	40
Roosevelt Schools NY	Roosevelt Middle School	148	2	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	149	2	Classroom	3	3	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.11	0.04	0.07	88	29	59
Roosevelt Schools NY	Roosevelt Middle School	150	2	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	151	2	Classroom	2	2	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.07	0.02	0.05	59	20	39
Roosevelt Schools NY	Roosevelt Middle School	152	2	Storage	1	1	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.06	0.02	0.03	33	13	20
Roosevelt Schools NY	Roosevelt Middle School	153	2	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	154	2	Classroom	2	2	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.07	0.02	0.05	59	20	39
Roosevelt Schools NY	Roosevelt Middle School	155	2	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	156	2	Classroom	2	2	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.07	0.02	0.05	59	20	39
Roosevelt Schools NY	Roosevelt Middle School	157	2	Electrical Room	2	2	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.11	0.04	0.07	66	26	40

Roosevelt UFSD, NY
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Site Name	Building Name	Index	Floor	Location	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Roosevelt Schools NY	Roosevelt Middle School	158	2	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	159	2	Classroom	2	2	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.07	0.02	0.05	59	20	39
Roosevelt Schools NY	Roosevelt Middle School	160	2	Classroom	8	8	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.44	0.18	0.26	360	144	216
Roosevelt Schools NY	Roosevelt Middle School	161	2	Classroom	1	1	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.04	0.01	0.02	29	10	20
Roosevelt Schools NY	Roosevelt Middle School	162	2	Office	1	1	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	1,760	0.08	0.03	0.05	144	58	86
Roosevelt Schools NY	Roosevelt Middle School	163	2	Office	1	1	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	1,760	0.08	0.03	0.05	144	58	86
Roosevelt Schools NY	Roosevelt Middle School	164	2	Storage	2	2	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	600	0.16	0.07	0.10	98	40	59
Roosevelt Schools NY	Roosevelt Middle School	165	2	Hallway	26	26	0.0710	0.0350	2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	3,000	1.85	0.91	0.94	5,538	2,730	2,808
Roosevelt Schools NY	Roosevelt Middle School	166	2	Hallway	37	37	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	3,000	1.33	0.44	0.89	3,996	1,332	2,664
Roosevelt Schools NY	Roosevelt Middle School	167	2	Hallway	6	6	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt Middle School	168	2	Library	4	4	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XL, HI	3,750	0.22	0.09	0.13	825	330	495
Roosevelt Schools NY	Roosevelt Middle School	169	2	Library	10	10	0.2130	0.0780	6-Lamp 40 Biax	LED Int. Driver Lamp, (6) 40w BX EQ, XL	2,200	2.13	0.78	1.35	4,686	1,716	2,970
Roosevelt Schools NY	Roosevelt Middle School	170	2	Library	30	30	0.0460	0.0315	CF PL 42w	LED Cylinder, ~3000 Lumen, Pendant Mount, HI	2,200	1.38	0.95	0.44	3,036	2,079	957
Roosevelt Schools NY	Roosevelt Middle School	171	2	Library	7	7	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp, HI	2,200	0.43	0.18	0.26	955	385	570
Roosevelt Schools NY	Roosevelt Middle School	172	2	Library	4	4	0.0170	0.0080	1x2, 1-Lamp T8	LED Int. Driver Lamp, (1) 2' Lamp	2,200	0.07	0.03	0.04	150	70	79
Roosevelt Schools NY	Roosevelt Middle School	173	2	Library	2	2	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt Middle School	174	2	Office	4	4	0.0710	0.0350	2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	1,760	0.28	0.14	0.14	500	246	253
Roosevelt Schools NY	Roosevelt Middle School	175	2	Office	10	10	0.0710	0.0350	2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	1,760	0.71	0.35	0.36	1,250	616	634
Roosevelt Schools NY	Roosevelt Middle School	176	2	Office	2	2	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	1,760	0.16	0.07	0.10	289	116	172
Roosevelt Schools NY	Roosevelt Middle School	177	2	Conference Rm	4	4	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,760	0.22	0.09	0.13	387	155	232
Roosevelt Schools NY	Roosevelt Middle School	178	2	Conference Rm	5	5	0.0355	0.0130	A 1-Lamp 40 Biax	LED Int. Driver Lamp, (1) 40w BX EQ	1,760	0.18	0.07	0.11	312	114	198
Roosevelt Schools NY	Roosevelt Middle School	179	2	Lab	16	16	0.0440	0.0260	A 1-Lamp 40 Biax	LED Int. Driver Lamp, (2) 40w BX EQ	818	0.70	0.42	0.29	576	340	236
Roosevelt Schools NY	Roosevelt Middle School	180	2	Office	4	4	0.0710	0.0260	2-Lamp 40 Biax	LED Int. Driver Lamp, (2) 40w BX EQ	1,760	0.28	0.10	0.18	500	183	317
Roosevelt Schools NY	Roosevelt Middle School	181	2	Storage	3	3	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	600	0.25	0.10	0.15	148	59	88
Roosevelt Schools NY	Roosevelt Middle School	182	2	Classroom	9	9	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	818	0.74	0.30	0.44	604	243	361
Roosevelt Schools NY	Roosevelt Middle School	183	2	Classroom	4	4	0.0355	0.0130	A 1-Lamp 40 Biax	LED Int. Driver Lamp, (1) 40w BX EQ	818	0.14	0.05	0.09	116	43	74
Roosevelt Schools NY	Roosevelt Middle School	184	2	Classroom	7	7	0.0360	0.0090	CF PL 32w	LED Retrofit Can Kit, 6 Inch, NLO	818	0.25	0.06	0.19	206	52	155
Roosevelt Schools NY	Roosevelt Middle School	185	2	Classroom Range Hood	1	1	0.0400	0.0060	Inc 40w	LED Lamp, A-Line, LLO	818	0.04	0.01	0.03	33	5	28
Roosevelt Schools NY	Roosevelt Middle School	186	2	Kitchen	3	3	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	818	0.25	0.10	0.15	201	81	120
Roosevelt Schools NY	Roosevelt Middle School	187	2	Kitchen Rangehood	4	4	0.0400	0.0060	Inc 40w	LED Lamp, A-Line, LLO	818	0.16	0.02	0.14	131	20	111
Roosevelt Schools NY	Roosevelt Middle School	188	2	Kitchen Task Lighting	2	2	0.0170	0.0080	1x2, 1-Lamp T8	LED Int. Driver Lamp, (1) 2' Lamp	818	0.03	0.02	0.02	28	13	15
Roosevelt Schools NY	Roosevelt Middle School	189	2	Kitchen Task Lighting	4	4	0.0280	0.0110	1x4, 1-Lamp T8	LED Int. Driver Lamp, (1) 4' Lamp	818	0.11	0.04	0.07	92	36	56
Roosevelt Schools NY	Roosevelt Middle School	190	2	Classroom	7	7	0.0360	0.0090	CF PL 32w	LED Retrofit Can Kit, 6 Inch, NLO	818	0.25	0.06	0.19	206	52	155
Roosevelt Schools NY	Roosevelt Middle School	191	2	Classroom	9	9	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	818	0.74	0.30	0.44	604	243	361

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Site Name	Building Name	Index	Floor	Location	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Roosevelt Schools NY	Roosevelt Middle School	192	2	Classroom Range Hood	1	1	0.0400	0.0060	Inc 40w	LED Lamp, A-Line, LLO	818	0.04	0.01	0.03	33	5	28
Roosevelt Schools NY	Roosevelt Middle School	193	2	Classroom	3	3	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	818	0.25	0.10	0.15	201	81	120
Roosevelt Schools NY	Roosevelt Middle School	194	2	Classroom Range Hood	4	4	0.0400	0.0060	Inc 40w	LED Lamp, A-Line, LLO	818	0.16	0.02	0.14	131	20	111
Roosevelt Schools NY	Roosevelt Middle School	195	2	Classroom Task Lightng	4	4	0.0280	0.0110	1x4, 1-Lamp T8	LED Int. Driver Lamp, (1) 4' Lamp	818	0.11	0.04	0.07	92	36	56
Roosevelt Schools NY	Roosevelt Middle School	196	2	Classroom Task Lightng	2	2	0.0170	0.0080	1x2, 1-Lamp T8	LED Int. Driver Lamp, (1) 2' Lamp	818	0.03	0.02	0.02	28	13	15
Roosevelt Schools NY	Roosevelt Middle School	197	2	Storage	2	2	0.0550	0.0220	2x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.11	0.04	0.07	66	26	40
Roosevelt Schools NY	Roosevelt Middle School	198	2	Electrical Rm	1	1	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.06	0.02	0.03	33	13	20
Roosevelt Schools NY	Roosevelt Middle School	199	2	Classroom	19	19	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	818	1.56	0.63	0.93	1,274	513	762
Roosevelt Schools NY	Roosevelt Middle School	200	2	Classroom	2	2	0.0355	0.0130	A 1-Lamp 40 Biax	LED Int. Driver Lamp, (1) 40w BX EQ	818	0.07	0.03	0.05	58	21	37
Roosevelt Schools NY	Roosevelt Middle School	201	2	Classroom	2	2	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt Middle School	202	2	Classroom	1	1	0.0360	0.0090	CF PL 32w	LED Retrofit Can Kit, 6 Inch, NLO	818	0.04	0.01	0.03	29	7	22
Roosevelt Schools NY	Roosevelt Middle School	203	2	Storage	2	2	0.0550	0.0220	2x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.11	0.04	0.07	66	26	40
Roosevelt Schools NY	Roosevelt Middle School	204	2	Storage	1	1	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.06	0.02	0.03	33	13	20
Roosevelt Schools NY	Roosevelt Middle School	205	2	Classroom	12	12	0.0550	0.0220	2x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	206	2	Classroom	19	19	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	818	1.56	0.63	0.93	1,274	513	762
Roosevelt Schools NY	Roosevelt Middle School	207	2	Classroom	1	1	0.0360	0.0090	CF PL 32w	LED Retrofit Can Kit, 6 Inch, NLO	818	0.04	0.01	0.03	29	7	22
Roosevelt Schools NY	Roosevelt Middle School	208	2	Classroom	2	2	0.0355	0.0130	A 1-Lamp 40 Biax	LED Int. Driver Lamp, (1) 40w BX EQ	818	0.07	0.03	0.05	58	21	37
Roosevelt Schools NY	Roosevelt Middle School	209	2	Classroom	2	2	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt Middle School	210	2	Telecom Rm	1	1	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.06	0.02	0.03	33	13	20
Roosevelt Schools NY	Roosevelt Middle School	211	2	Strorage	1	1	0.0550	0.0220	2x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.06	0.02	0.03	33	13	20
Roosevelt Schools NY	Roosevelt Middle School	212	2	Classroom	24	24	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	1.32	0.53	0.79	1,080	432	648
Roosevelt Schools NY	Roosevelt Middle School	213	2	Classroom Task Lighting	3	3	0.0280	0.0110	1x4, 1-Lamp T8	LED Int. Driver Lamp, (1) 4' Lamp	1,800	0.08	0.03	0.05	151	59	92
Roosevelt Schools NY	Roosevelt Middle School	214	2	Storage	10	10	0.0360	0.0090	CF PL 32w	LED Retrofit Can Kit, 6 Inch, NLO	750	0.36	0.09	0.27	270	68	203
Roosevelt Schools NY	Roosevelt Middle School	215	2	Storage	2	2	0.0600	0.0100	Inc 60w	LED Lamp, A-Line, NLO	750	0.12	0.02	0.10	90	15	75
Roosevelt Schools NY	Roosevelt Middle School	216	2	Storage	2	2	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	600	0.16	0.07	0.10	98	40	59
Roosevelt Schools NY	Roosevelt Middle School	217	2	Storage	2	2	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	600	0.16	0.07	0.10	98	40	59
Roosevelt Schools NY	Roosevelt Middle School	218	2	Classroom	24	24	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	1.32	0.53	0.79	1,080	432	648
Roosevelt Schools NY	Roosevelt Middle School	219	2	Classroom Task Lighting	3	3	0.0280	0.0110	1x4, 1-Lamp T8	LED Int. Driver Lamp, (1) 4' Lamp	1,800	0.08	0.03	0.05	151	59	92
Roosevelt Schools NY	Roosevelt Middle School	220	2	Storage	2	2	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	600	0.16	0.07	0.10	98	40	59
Roosevelt Schools NY	Roosevelt Middle School	221	2	Jc	1	1	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.06	0.02	0.03	33	13	20
Roosevelt Schools NY	Roosevelt Middle School	222	2	Restroom, Womens	5	5	0.0360	0.0090	CF PL 32w	LED Retrofit Can Kit, 6 Inch, NLO	1,760	0.18	0.05	0.14	317	79	238
Roosevelt Schools NY	Roosevelt Middle School	223	2	Restroom, Womens	4	4	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XL	1,760	0.22	0.09	0.13	387	155	232
Roosevelt Schools NY	Roosevelt Middle School	224	2	Restroom, Womens	1	1	0.0450	0.0220	1x3, 2-Lamp T8	LED Int. Driver Lamps, (2) 3' Lamps, XL	1,760	0.05	0.02	0.02	79	39	40
Roosevelt Schools NY	Roosevelt Middle School	225	2	Restroom, Mens	5	5	0.0360	0.0090	CF PL 32w	LED Retrofit Can Kit, 6 Inch, NLO	1,760	0.18	0.05	0.14	317	79	238

Roosevelt UFSD, NY
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Lighting Line by Line

Site Name	Building Name	Index	Floor	Location	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Roosevelt Schools NY	Roosevelt Middle School	226	2	Restroom, Mens	4	4	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XL	1,760	0.22	0.09	0.13	387	155	232
Roosevelt Schools NY	Roosevelt Middle School	227	2	Restroom, Mens	1	1	0.0450	0.0220	1x3, 2-Lamp T8	LED Int. Driver Lamps, (2) 3' Lamps, XL	1,760	0.05	0.02	0.02	79	39	40
Roosevelt Schools NY	Roosevelt Middle School	228	2	Storage	1	1	0.0550	0.0220	2x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.06	0.02	0.03	33	13	20
Roosevelt Schools NY	Roosevelt Middle School	229	2	Storage	1	1	0.0550	0.0220	2x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.06	0.02	0.03	33	13	20
Roosevelt Schools NY	Roosevelt Middle School	230	2	Hallway	10	10	0.0710	0.0350	2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	3,000	0.71	0.35	0.36	2,130	1,050	1,080
Roosevelt Schools NY	Roosevelt Middle School	231	2	Hallway	2	2	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt Middle School	232	2	Hallway	6	6	0.0360	0.0090	CF PL 32w	LED Retrofit Can Kit, 6 Inch, NLO	3,000	0.22	0.05	0.16	648	162	486
Roosevelt Schools NY	Roosevelt Middle School	233	2	Hallway Case	7	7	0.0240	0.0110	1x3, 1-Lamp T8	LED Int. Driver Lamp, (1) 3' Lamp	3,000	0.17	0.08	0.09	504	231	273
Roosevelt Schools NY	Roosevelt Middle School	234	2	Hallway Case	2	2	0.0280	0.0110	1x4, 1-Lamp T8	LED Int. Driver Lamp, (1) 4' Lamp	3,000	0.06	0.02	0.03	168	66	102
Roosevelt Schools NY	Roosevelt Middle School	235	2	Hallway	12	12	0.0710	0.0350	2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	3,000	0.85	0.42	0.43	2,556	1,260	1,296
Roosevelt Schools NY	Roosevelt Middle School	236	2	Hallway	4	4	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt Middle School	237	2	Hallway	4	4	0.0360	0.0090	CF PL 32w	LED Retrofit Can Kit, 6 Inch, NLO	3,000	0.14	0.04	0.11	432	108	324
Roosevelt Schools NY	Roosevelt Middle School	238	2	Hallway Case	1	1	0.0240	0.0110	1x3, 1-Lamp T8	LED Int. Driver Lamp, (1) 3' Lamp	3,000	0.02	0.01	0.01	72	33	39
Roosevelt Schools NY	Roosevelt Middle School	239	2	Hallway Case	1	1	0.0280	0.0110	1x4, 1-Lamp T8	LED Int. Driver Lamp, (1) 4' Lamp	3,000	0.03	0.01	0.02	84	33	51
Roosevelt Schools NY	Roosevelt Middle School	240	2	Hallway	18	18	0.0450	0.0220	1x3, 2-Lamp T8	LED Int. Driver Lamps, (2) 3' Lamps	3,000	0.81	0.40	0.41	2,430	1,188	1,242
Roosevelt Schools NY	Roosevelt Middle School	241	2	Hallway	2	2	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt Middle School	242	1	Office	6	6	0.0710	0.0260	2-Lamp 40 Biax	LED Int. Driver Lamp, (2) 40w BX EQ	1,760	0.43	0.16	0.27	750	275	475
Roosevelt Schools NY	Roosevelt Middle School	243	1	Office	1	1	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt Middle School	244	1	Conference	4	4	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,760	0.22	0.09	0.13	387	155	232
Roosevelt Schools NY	Roosevelt Middle School	245	1	Conference	4	4	0.0355	0.0130	A 1-Lamp 40 Biax	LED Int. Driver Lamp, (1) 40w BX EQ	1,760	0.14	0.05	0.09	250	92	158
Roosevelt Schools NY	Roosevelt Middle School	246	1	Office	2	2	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	1,760	0.16	0.07	0.10	289	116	172
Roosevelt Schools NY	Roosevelt Middle School	247	1	Office	2	2	0.0710	0.0260	2-Lamp 40 Biax	LED Int. Driver Lamp, (2) 40w BX EQ	1,760	0.14	0.05	0.09	250	92	158
Roosevelt Schools NY	Roosevelt Middle School	248	1	Hallway	6	6	0.0710	0.0350	2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	3,000	0.43	0.21	0.22	1,278	630	648
Roosevelt Schools NY	Roosevelt Middle School	249	1	Hallway	2	2	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt Middle School	250	1	Kitchen	1	1	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	2,000	0.04	0.01	0.02	72	24	48
Roosevelt Schools NY	Roosevelt Middle School	251	1	Kitchen Task Lighting	4	4	0.0280	0.0110	1x4, 1-Lamp T8	LED Int. Driver Lamp, (1) 4' Lamp	2,000	0.11	0.04	0.07	224	88	136
Roosevelt Schools NY	Roosevelt Middle School	252	1	Restroom	1	1	0.0360	0.0090	CF PL 32w	LED Retrofit Can Kit, 6 Inch, NLO	1,760	0.04	0.01	0.03	63	16	48
Roosevelt Schools NY	Roosevelt Middle School	253	1	Restroom	1	1	0.0320	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	1,760	0.03	0.02	0.02	56	28	28
Roosevelt Schools NY	Roosevelt Middle School	254	1	Storage	2	2	0.0550	0.0220	2x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.11	0.04	0.07	66	26	40
Roosevelt Schools NY	Roosevelt Middle School	255	1	Office	2	2	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	1,760	0.16	0.07	0.10	289	116	172
Roosevelt Schools NY	Roosevelt Middle School	256	1	Office	2	2	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	1,760	0.16	0.07	0.10	289	116	172
Roosevelt Schools NY	Roosevelt Middle School	257	1	Office	2	2	0.0550	0.0220	2x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,760	0.11	0.04	0.07	194	77	116
Roosevelt Schools NY	Roosevelt Middle School	258	1	Office	2	2	0.0550	0.0220	2x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,760	0.11	0.04	0.07	194	77	116
Roosevelt Schools NY	Roosevelt Middle School	259	1	Bed Area	4	4	0.0710	0.0350	2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	1,760	0.28	0.14	0.14	500	246	253

Roosevelt UFSD, NY
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ECM 1 - LED Lighting and Lighting Controls Upgrade
Lighting Line by Line

Site Name	Building Name	Index	Floor	Location	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Roosevelt Schools NY	Roosevelt Middle School	260	1	Bed Area	3	3	0.0280	0.0110	1x4, 1-Lamp T8	LED Int. Driver Lamp, (1) 4' Lamp	1,760	0.08	0.03	0.05	148	58	90
Roosevelt Schools NY	Roosevelt Middle School	261	1	Storage	2	2	0.0550	0.0220	2x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.11	0.04	0.07	66	26	40
Roosevelt Schools NY	Roosevelt Middle School	262	1	Restroom	1	1	0.0360	0.0090	CF PL 32w	LED Retrofit Can Kit, 6 Inch, NLO	1,760	0.04	0.01	0.03	63	16	48
Roosevelt Schools NY	Roosevelt Middle School	263	1	Restroom	1	1	0.0320	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	1,760	0.03	0.02	0.02	56	28	28
Roosevelt Schools NY	Roosevelt Middle School	264	1	Storage	2	2	0.0550	0.0220	2x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.11	0.04	0.07	66	26	40
Roosevelt Schools NY	Roosevelt Middle School	265	1	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	266	1	Classroom	3	3	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.11	0.04	0.07	88	29	59
Roosevelt Schools NY	Roosevelt Middle School	267	1	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	268	1	Classroom	3	3	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.11	0.04	0.07	88	29	59
Roosevelt Schools NY	Roosevelt Middle School	269	1	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	270	1	Classroom	3	3	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.11	0.04	0.07	88	29	59
Roosevelt Schools NY	Roosevelt Middle School	271	1	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	272	1	Classroom	3	3	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.11	0.04	0.07	88	29	59
Roosevelt Schools NY	Roosevelt Middle School	273	1	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	274	1	Classroom	1	1	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.04	0.01	0.02	29	10	20
Roosevelt Schools NY	Roosevelt Middle School	275	1	Office	2	2	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	1,760	0.16	0.07	0.10	289	116	172
Roosevelt Schools NY	Roosevelt Middle School	276	1	Storage	5	5	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	600	0.28	0.11	0.17	165	66	99
Roosevelt Schools NY	Roosevelt Middle School	277	1	Restroom, Mens	4	4	0.0360	0.0090	CF PL 32w	LED Retrofit Can Kit, 6 Inch, NLO	1,760	0.14	0.04	0.11	253	63	190
Roosevelt Schools NY	Roosevelt Middle School	278	1	Restroom, Mens	4	4	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XL	1,760	0.22	0.09	0.13	387	155	232
Roosevelt Schools NY	Roosevelt Middle School	279	1	Restroom, Mens	1	1	0.0450	0.0220	1x3, 2-Lamp T8	LED Int. Driver Lamps, (2) 3' Lamps, XL	1,760	0.05	0.02	0.02	79	39	40
Roosevelt Schools NY	Roosevelt Middle School	280	1	Jc	1	1	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.06	0.02	0.03	33	13	20
Roosevelt Schools NY	Roosevelt Middle School	281	1	Restroom, Womens	4	4	0.0360	0.0090	CF PL 32w	LED Retrofit Can Kit, 6 Inch, NLO	1,760	0.14	0.04	0.11	253	63	190
Roosevelt Schools NY	Roosevelt Middle School	282	1	Restroom, Womens	4	4	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XL	1,760	0.22	0.09	0.13	387	155	232
Roosevelt Schools NY	Roosevelt Middle School	283	1	Restroom, Womens	1	1	0.0450	0.0220	1x3, 2-Lamp T8	LED Int. Driver Lamps, (2) 3' Lamps, XL	1,760	0.05	0.02	0.02	79	39	40
Roosevelt Schools NY	Roosevelt Middle School	284	1	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	285	1	Classroom	1	1	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.04	0.01	0.02	29	10	20
Roosevelt Schools NY	Roosevelt Middle School	286	1	Restroom	1	1	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	1,760	0.04	0.01	0.02	63	21	42
Roosevelt Schools NY	Roosevelt Middle School	287	1	Storage	1	1	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.06	0.02	0.03	33	13	20
Roosevelt Schools NY	Roosevelt Middle School	288	1	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	289	1	Classroom	3	3	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.11	0.04	0.07	88	29	59
Roosevelt Schools NY	Roosevelt Middle School	290	1	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	291	1	Classroom	3	3	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.11	0.04	0.07	88	29	59
Roosevelt Schools NY	Roosevelt Middle School	292	1	Breakroom	8	8	0.0710	0.0260	2-Lamp 40 Biax	LED Int. Driver Lamp, (2) 40w BX EQ	2,000	0.57	0.21	0.36	1,136	416	720
Roosevelt Schools NY	Roosevelt Middle School	293	1	Breakroom	5	5	0.0360	0.0090	CF PL 32w	LED Retrofit Can Kit, 6 Inch, NLO	2,000	0.18	0.05	0.14	360	90	270

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Site Name	Building Name	Index	Floor	Location	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Roosevelt Schools NY	Roosevelt Middle School	294	1	Breakroom Task Lighting	6	6	0.0280	0.0110	1x4, 1-Lamp T8	LED Int. Driver Lamp, (1) 4' Lamp	2,000	0.17	0.07	0.10	336	132	204
Roosevelt Schools NY	Roosevelt Middle School	295	1	Restroom	1	1	0.0360	0.0090	CF PL 32w	LED Retrofit Can Kit, 6 Inch, NLO	1,760	0.04	0.01	0.03	63	16	48
Roosevelt Schools NY	Roosevelt Middle School	296	1	Restroom	1	1	0.0320	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	1,760	0.03	0.02	0.02	56	28	28
Roosevelt Schools NY	Roosevelt Middle School	297	1	Office	2	2	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	1,760	0.16	0.07	0.10	289	116	172
Roosevelt Schools NY	Roosevelt Middle School	298	1	Electrical Rm	2	2	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.11	0.04	0.07	66	26	40
Roosevelt Schools NY	Roosevelt Middle School	299	1	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	300	1	Classroom	2	2	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.07	0.02	0.05	59	20	39
Roosevelt Schools NY	Roosevelt Middle School	301	1	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	302	1	Classroom	2	2	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.07	0.02	0.05	59	20	39
Roosevelt Schools NY	Roosevelt Middle School	303	1	Storage	1	1	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.06	0.02	0.03	33	13	20
Roosevelt Schools NY	Roosevelt Middle School	304	1	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	305	1	Classroom	2	2	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.07	0.02	0.05	59	20	39
Roosevelt Schools NY	Roosevelt Middle School	306	1	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	307	1	Classroom	3	3	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.11	0.04	0.07	88	29	59
Roosevelt Schools NY	Roosevelt Middle School	308	1	Storage	1	1	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.06	0.02	0.03	33	13	20
Roosevelt Schools NY	Roosevelt Middle School	309	1	Storage	1	1	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.06	0.02	0.03	33	13	20
Roosevelt Schools NY	Roosevelt Middle School	310	1	Storage	2	2	0.0710	0.0350	2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	600	0.14	0.07	0.07	85	42	43
Roosevelt Schools NY	Roosevelt Middle School	311	1	Storage	2	2	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	600	0.16	0.07	0.10	98	40	59
Roosevelt Schools NY	Roosevelt Middle School	312	1	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	313	1	Classroom	3	3	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.11	0.04	0.07	88	29	59
Roosevelt Schools NY	Roosevelt Middle School	314	1	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	315	1	Classroom	2	2	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.07	0.02	0.05	59	20	39
Roosevelt Schools NY	Roosevelt Middle School	316	1	Storage	1	1	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.06	0.02	0.03	33	13	20
Roosevelt Schools NY	Roosevelt Middle School	317	1	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	318	1	Classroom	2	2	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.07	0.02	0.05	59	20	39
Roosevelt Schools NY	Roosevelt Middle School	319	1	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	320	1	Classroom	2	2	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.07	0.02	0.05	59	20	39
Roosevelt Schools NY	Roosevelt Middle School	321	1	Electrical Rm	2	2	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.11	0.04	0.07	66	26	40
Roosevelt Schools NY	Roosevelt Middle School	322	1	Classroom	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	323	1	Classroom	2	2	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.07	0.02	0.05	59	20	39
Roosevelt Schools NY	Roosevelt Middle School	324	1	Office	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XXL	818	0.66	0.26	0.40	540	216	324
Roosevelt Schools NY	Roosevelt Middle School	325	1	Office	1	1	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	818	0.04	0.01	0.02	29	10	20
Roosevelt Schools NY	Roosevelt Middle School	326	1	Office	1	1	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	1,760	0.08	0.03	0.05	144	58	86
Roosevelt Schools NY	Roosevelt Middle School	327	1	Office	1	1	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	1,760	0.08	0.03	0.05	144	58	86

Roosevelt UFSD, NY
Exhibit D-5-1
ECM 1 - LED Lighting and Lighting Controls Upgrade
Lighting Line by Line

Site Name	Building Name	Index	Floor	Location	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Roosevelt Schools NY	Roosevelt Middle School	328	1	Hallway	25	25	0.0710	0.0350	2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	3,000	1.78	0.88	0.90	5,325	2,625	2,700
Roosevelt Schools NY	Roosevelt Middle School	329	1	Hallway	8	8	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt Middle School	330	1	Hallway	37	37	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	3,000	1.33	0.44	0.89	3,996	1,332	2,664
Roosevelt Schools NY	Roosevelt Middle School	331	1	Office	9	9	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	1,760	0.32	0.11	0.22	570	190	380
Roosevelt Schools NY	Roosevelt Middle School	332	1	Office	6	6	0.0360	0.0090	CF PL 32w	LED Retrofit Can Kit, 6 Inch, NLO	1,760	0.22	0.05	0.16	380	95	285
Roosevelt Schools NY	Roosevelt Middle School	333	1	Office	2	2	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt Middle School	334	1	Office	4	4	0.0710	0.0350	2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	1,760	0.28	0.14	0.14	500	246	253
Roosevelt Schools NY	Roosevelt Middle School	335	1	Vestibule	2	2	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	3,000	0.07	0.02	0.05	216	72	144
Roosevelt Schools NY	Roosevelt Middle School	336	1	Vestibule	1	1	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt Middle School	337	1	Office	2	2	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	1,760	0.16	0.07	0.10	289	116	172
Roosevelt Schools NY	Roosevelt Middle School	338	1	Office	2	2	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	1,760	0.16	0.07	0.10	289	116	172
Roosevelt Schools NY	Roosevelt Middle School	339	1	Office	4	4	0.0710	0.0260	2-Lamp 40 Biax	LED Int. Driver Lamp, (2) 40w BX EQ	1,760	0.28	0.10	0.18	500	183	317
Roosevelt Schools NY	Roosevelt Middle School	340	1	Office	2	2	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	1,760	0.16	0.07	0.10	289	116	172
Roosevelt Schools NY	Roosevelt Middle School	341	1	Office	4	4	0.0710	0.0260	2-Lamp 40 Biax	LED Int. Driver Lamp, (2) 40w BX EQ	1,760	0.28	0.10	0.18	500	183	317
Roosevelt Schools NY	Roosevelt Middle School	342	1	Office	2	2	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	1,760	0.16	0.07	0.10	289	116	172
Roosevelt Schools NY	Roosevelt Middle School	343	1	Restroom	1	1	0.0360	0.0090	CF PL 32w	LED Retrofit Can Kit, 6 Inch, NLO	1,760	0.04	0.01	0.03	63	16	48
Roosevelt Schools NY	Roosevelt Middle School	344	1	Restroom	1	1	0.0320	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	1,760	0.03	0.02	0.02	56	28	28
Roosevelt Schools NY	Roosevelt Middle School	345	1	Restroom	1	1	0.0320	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	1,760	0.03	0.02	0.02	56	28	28
Roosevelt Schools NY	Roosevelt Middle School	346	1	Restroom	1	1	0.0360	0.0090	CF PL 32w	LED Retrofit Can Kit, 6 Inch, NLO	1,760	0.04	0.01	0.03	63	16	48
Roosevelt Schools NY	Roosevelt Middle School	347	1	Hallway	6	6	0.0710	0.0260	2-Lamp 40 Biax	LED Int. Driver Lamp, (2) 40w BX EQ	3,000	0.43	0.16	0.27	1,278	468	810
Roosevelt Schools NY	Roosevelt Middle School	348	1	Hallway	2	2	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt Middle School	349	1	Storage	2	2	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.11	0.04	0.07	66	26	40
Roosevelt Schools NY	Roosevelt Middle School	350	1	Office	2	2	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	1,760	0.16	0.07	0.10	289	116	172
Roosevelt Schools NY	Roosevelt Middle School	351	1	Office Task Lighting	4	4	0.0280	0.0110	1x4, 1-Lamp T8	LED Int. Driver Lamp, (1) 4' Lamp	2,200	0.11	0.04	0.07	246	97	150
Roosevelt Schools NY	Roosevelt Middle School	352	1	Storage	1	1	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.06	0.02	0.03	33	13	20
Roosevelt Schools NY	Roosevelt Middle School	353	1	Storage	1	1	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.06	0.02	0.03	33	13	20
Roosevelt Schools NY	Roosevelt Middle School	354	1	Hallway	8	8	0.0710	0.0350	2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	3,000	0.57	0.28	0.29	1,704	840	864
Roosevelt Schools NY	Roosevelt Middle School	355	1	Hallway	2	2	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt Middle School	356	1	Hallway Case	6	6	0.0240	0.0110	1x3, 1-Lamp T8	LED Int. Driver Lamp, (1) 3' Lamp	3,750	0.14	0.07	0.08	540	248	293
Roosevelt Schools NY	Roosevelt Middle School	357	1	Hallway Case	1	1	0.0280	0.0110	1x4, 1-Lamp T8	LED Int. Driver Lamp, (1) 4' Lamp	3,750	0.03	0.01	0.02	105	41	64
Roosevelt Schools NY	Roosevelt Middle School	358	1	Eletrical Rm	1	1	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	750	0.06	0.02	0.03	41	17	25
Roosevelt Schools NY	Roosevelt Middle School	359	1	It Rm	1	1	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.06	0.02	0.03	33	13	20
Roosevelt Schools NY	Roosevelt Middle School	360	1	Cardio Room	6	6	0.0550	0.0220	2x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	818	0.33	0.13	0.20	270	108	162
Roosevelt Schools NY	Roosevelt Middle School	361	1	Cardio Room	4	4	0.0355	0.0130	A 1-Lamp 40 Biax	LED Int. Driver Lamp, (1) 40w BX EQ	818	0.14	0.05	0.09	116	43	74

Roosevelt UFSD, NY
Exhibit D-5-1
ECM 1 - LED Lighting and Lighting Controls Upgrade
Lighting Line by Line

Site Name	Building Name	Index	Floor	Location	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Roosevelt Schools NY	Roosevelt Middle School	362	1	Cardio Room	1	1	0.0360	0.0090	CF PL 32w	LED Retrofit Can Kit, 6 Inch, NLO	818	0.04	0.01	0.03	29	7	22
Roosevelt Schools NY	Roosevelt Middle School	363	1	Storage	1	1	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.06	0.02	0.03	33	13	20
Roosevelt Schools NY	Roosevelt Middle School	364	1	Storage	2	2	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.11	0.04	0.07	66	26	40
Roosevelt Schools NY	Roosevelt Middle School	365	1	Boys Locker Room	5	5	0.0710	0.0350	2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	1,760	0.36	0.18	0.18	625	308	317
Roosevelt Schools NY	Roosevelt Middle School	366	1	Boys Locker Room	2	2	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt Middle School	367	1	Boys Locker Room	8	8	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,760	0.44	0.18	0.26	774	310	465
Roosevelt Schools NY	Roosevelt Middle School	368	1	Boys Locker Room Showers	6	6	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XL	1,760	0.33	0.13	0.20	581	232	348
Roosevelt Schools NY	Roosevelt Middle School	369	1	Storage	2	2	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.11	0.04	0.07	66	26	40
Roosevelt Schools NY	Roosevelt Middle School	370	1	Boys Locker Room Showers	3	3	0.0360	0.0090	CF PL 32w	LED Retrofit Can Kit, 6 Inch, NLO	1,760	0.11	0.03	0.08	190	48	143
Roosevelt Schools NY	Roosevelt Middle School	371	1	Boys Locker Room Showers	1	1	0.0450	0.0220	1x3, 2-Lamp T8	LED Int. Driver Lamps, (2) 3' Lamps, XL	1,760	0.05	0.02	0.02	79	39	40
Roosevelt Schools NY	Roosevelt Middle School	372	1	Boys Locker Room Showers	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XL	1,760	0.17	0.07	0.10	290	116	174
Roosevelt Schools NY	Roosevelt Middle School	373	1	Boys Locker Room Showers	2	2	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt Middle School	374	1	Boys Locker Room Showers	5	5	0.0710	0.0350	2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	1,760	0.36	0.18	0.18	625	308	317
Roosevelt Schools NY	Roosevelt Middle School	375	1	Office	1	1	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	1,760	0.08	0.03	0.05	144	58	86
Roosevelt Schools NY	Roosevelt Middle School	376	1	Bathroom	2	2	0.0130	0.0060	CFL 13w	LED Lamp, A-Line, LLO	704	0.03	0.01	0.01	18	8	10
Roosevelt Schools NY	Roosevelt Middle School	377	1	Bathroom	1	1	0.0320	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	704	0.03	0.02	0.02	23	11	11
Roosevelt Schools NY	Roosevelt Middle School	378	1	Jc	1	1	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.06	0.02	0.03	33	13	20
Roosevelt Schools NY	Roosevelt Middle School	379	1	Bathroom, Men's	5	5	0.0360	0.0090	CF PL 32w	LED Retrofit Can Kit, 6 Inch, NLO	1,760	0.18	0.05	0.14	317	79	238
Roosevelt Schools NY	Roosevelt Middle School	380	1	Bathroom, Men's	4	4	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XL	1,760	0.22	0.09	0.13	387	155	232
Roosevelt Schools NY	Roosevelt Middle School	381	1	Bathroom, Women's	5	5	0.0360	0.0090	CF PL 32w	LED Retrofit Can Kit, 6 Inch, NLO	1,760	0.18	0.05	0.14	317	79	238
Roosevelt Schools NY	Roosevelt Middle School	382	1	Bathroom, Women's	4	4	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XL	1,760	0.22	0.09	0.13	387	155	232
Roosevelt Schools NY	Roosevelt Middle School	383	1	Jc	1	1	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.06	0.02	0.03	33	13	20
Roosevelt Schools NY	Roosevelt Middle School	384	1	Girls Locker Room	5	5	0.0710	0.0350	2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	1,760	0.36	0.18	0.18	625	308	317
Roosevelt Schools NY	Roosevelt Middle School	385	1	Girls Locker Room	2	2	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt Middle School	386	1	Girls Locker Room	8	8	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,760	0.44	0.18	0.26	774	310	465
Roosevelt Schools NY	Roosevelt Middle School	387	1	Girls Locker Room Showers	6	6	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XL	1,760	0.33	0.13	0.20	581	232	348
Roosevelt Schools NY	Roosevelt Middle School	388	1	Storage	1	1	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.06	0.02	0.03	33	13	20
Roosevelt Schools NY	Roosevelt Middle School	389	1	Girls Locker Room Showers	3	3	0.0360	0.0090	CF PL 32w	LED Retrofit Can Kit, 6 Inch, NLO	1,760	0.11	0.03	0.08	190	48	143
Roosevelt Schools NY	Roosevelt Middle School	390	1	Girls Locker Room Showers	1	1	0.0450	0.0220	1x3, 2-Lamp T8	LED Int. Driver Lamps, (2) 3' Lamps, XL	1,760	0.05	0.02	0.02	79	39	40
Roosevelt Schools NY	Roosevelt Middle School	391	1	Girls Locker Room Showers	3	3	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XL	1,760	0.17	0.07	0.10	290	116	174
Roosevelt Schools NY	Roosevelt Middle School	392	1	Girls Locker Room Showers	2	2	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt Middle School	393	1	Girls Locker Room Showers	5	5	0.0710	0.0350	2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	1,760	0.36	0.18	0.18	625	308	317
Roosevelt Schools NY	Roosevelt Middle School	394	1	Office	1	1	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	1,760	0.08	0.03	0.05	144	58	86
Roosevelt Schools NY	Roosevelt Middle School	395	1	Bathroom	2	2	0.0130	0.0060	CFL 13w	LED Lamp, A-Line, LLO	704	0.03	0.01	0.01	18	8	10

Roosevelt UFSD, NY
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Site Name	Building Name	Index	Floor	Location	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Roosevelt Schools NY	Roosevelt Middle School	396	1	Bathroom	1	1	0.0320	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	704	0.03	0.02	0.02	23	11	11
Roosevelt Schools NY	Roosevelt Middle School	397	1	Hallway	13	13	0.0710	0.0350	2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	3,000	0.92	0.46	0.47	2,769	1,365	1,404
Roosevelt Schools NY	Roosevelt Middle School	398	1	Hallway	4	4	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	3,000	0.14	0.05	0.10	432	144	288
Roosevelt Schools NY	Roosevelt Middle School	399	1	Hallway	2	2	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt Middle School	400	1	Gym	24	24	0.4560	0.1420	(8) CF PL 70w	LED High Bay, 23K Lumens, 1x2, OSF, WG, PM	3,221	10.94	3.41	7.54	35,251	10,977	24,273
Roosevelt Schools NY	Roosevelt Middle School	401	1	Gym	4	4	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	3,221	0.14	0.05	0.10	464	155	309
Roosevelt Schools NY	Roosevelt Middle School	402	1	Gym	4	4	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt Middle School	403	1	Storage	2	2	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.11	0.04	0.07	66	26	40
Roosevelt Schools NY	Roosevelt Middle School	404	1	Storage	2	2	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.11	0.04	0.07	66	26	40
Roosevelt Schools NY	Roosevelt Middle School	405	1	Auditorium	40	40	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XL, HI, SCAF	1,760	2.20	0.88	1.32	3,872	1,549	2,323
Roosevelt Schools NY	Roosevelt Middle School	406	1	Auditorium	20	20	0.1000	0.0170	Inc 100w	LED Lamp, R/PAR38, NLO, 120v DIM, HI, SCAF	1,760	2.00	0.34	1.66	3,520	598	2,922
Roosevelt Schools NY	Roosevelt Middle School	407	1	Auditorium	4	4	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt Middle School	408	1	Auditorium	2	2	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO, DIM120	1,760	0.07	0.02	0.05	127	42	84
Roosevelt Schools NY	Roosevelt Middle School	409	1	Stage	18	18	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, HI	1,760	0.99	0.40	0.59	1,742	697	1,045
Roosevelt Schools NY	Roosevelt Middle School	410	1	Srorage	2	2	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XL	600	0.11	0.04	0.07	66	26	40
Roosevelt Schools NY	Roosevelt Middle School	411	1	Srorage	2	2	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.11	0.04	0.07	66	26	40
Roosevelt Schools NY	Roosevelt Middle School	412	1	Srorage	2	2	0.1090	0.0440	2x4, 4-Lamp T8	LED Int. Driver Lamps, (4) 4' Lamps	600	0.22	0.09	0.13	131	53	78
Roosevelt Schools NY	Roosevelt Middle School	413	1	Audio Room	3	3	0.0710	0.0350	2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	600	0.21	0.11	0.11	128	63	65
Roosevelt Schools NY	Roosevelt Middle School	414	1	Audio Room	5	5	0.1000	0.0170	Inc 100w	LED Lamp, R/PAR38, NLO, 120v DIM	600	0.50	0.09	0.42	300	51	249
Roosevelt Schools NY	Roosevelt Middle School	415	1	Storage	1	1	0.0550	0.0220	2x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.06	0.02	0.03	33	13	20
Roosevelt Schools NY	Roosevelt Middle School	416	1	Hallway	6	6	0.0710	0.0350	2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	3,000	0.43	0.21	0.22	1,278	630	648
Roosevelt Schools NY	Roosevelt Middle School	417	1	Hallway	9	9	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	3,000	0.32	0.11	0.22	972	324	648
Roosevelt Schools NY	Roosevelt Middle School	418	1	Hallway	2	2	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt Middle School	419	1	Hallway Case	6	6	0.0240	0.0110	1x3, 1-Lamp T8	LED Int. Driver Lamp, (1) 3' Lamp	3,750	0.14	0.07	0.08	540	248	293
Roosevelt Schools NY	Roosevelt Middle School	420	1	Hallway	1	1	0.0280	0.0110	1x4, 1-Lamp T8	LED Int. Driver Lamp, (1) 4' Lamp	3,750	0.03	0.01	0.02	105	41	64
Roosevelt Schools NY	Roosevelt Middle School	421	1	Classroom	15	15	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	818	1.23	0.50	0.74	1,006	405	601
Roosevelt Schools NY	Roosevelt Middle School	422	1	Classroom	5	5	0.0355	0.0130	A 1-Lamp 40 Biax	LED Int. Driver Lamp, (1) 40w BX EQ	818	0.18	0.07	0.11	145	53	92
Roosevelt Schools NY	Roosevelt Middle School	423	1	Classroom	2	2	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt Middle School	424	1	Classroom	3	3	0.0360	0.0090	CF PL 32w	LED Retrofit Can Kit, 6 Inch, NLO	818	0.11	0.03	0.08	88	22	66
Roosevelt Schools NY	Roosevelt Middle School	425	1	Classroom Task Lighting	1	1	0.0280	0.0110	1x4, 1-Lamp T8	LED Int. Driver Lamp, (1) 4' Lamp	818	0.03	0.01	0.02	23	9	14
Roosevelt Schools NY	Roosevelt Middle School	426	1	Pratice Room	1	1	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	818	0.08	0.03	0.05	67	27	40
Roosevelt Schools NY	Roosevelt Middle School	427	1	Storage	4	4	0.0550	0.0220	2x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.22	0.09	0.13	132	53	79
Roosevelt Schools NY	Roosevelt Middle School	428	1	Storage	4	4	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	600	0.33	0.13	0.20	197	79	118
Roosevelt Schools NY	Roosevelt Middle School	429	1	Classroom	12	12	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	818	0.98	0.40	0.59	805	324	481

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Roosevelt Schools NY	Roosevelt Middle School	430	1	Classroom	15	15	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	818	1.23	0.50	0.74	1,006	405	601
Roosevelt Schools NY	Roosevelt Middle School	431	1	Classroom	5	5	0.0355	0.0130	A 1-Lamp 40 Biax	LED Int. Driver Lamp, (1) 40w BX EQ	818	0.18	0.07	0.11	145	53	92
Roosevelt Schools NY	Roosevelt Middle School	432	1	Classroom	2	2	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt Middle School	433	1	Classroom	3	3	0.0360	0.0090	CF PL 32w	LED Retrofit Can Kit, 6 Inch, NLO	818	0.11	0.03	0.08	88	22	66
Roosevelt Schools NY	Roosevelt Middle School	434	1	Classroom Task Lighting	1	1	0.0280	0.0110	1x4, 1-Lamp T8	LED Int. Driver Lamp, (1) 4' Lamp	818	0.03	0.01	0.02	23	9	14
Roosevelt Schools NY	Roosevelt Middle School	435	1	Pratice Room	1	1	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	818	0.08	0.03	0.05	67	27	40
Roosevelt Schools NY	Roosevelt Middle School	436	1	Hallway	11	11	0.0820	0.0330	2x4, 3-Lamp T8	LED Int. Driver Lamps, (3) 4' Lamps	3,000	0.90	0.36	0.54	2,706	1,089	1,617
Roosevelt Schools NY	Roosevelt Middle School	437	1	Bolier Rm	13	13	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.72	0.29	0.43	429	172	257
Roosevelt Schools NY	Roosevelt Middle School	438	1	Bolier Rm	2	2	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt Middle School	439	1	Bolier Rm	1	1	0.0500	0.0500	Frog Eyes, 2X	will Not be Retrofit	8,760	0.05	0.05	-	438	438	-
Roosevelt Schools NY	Roosevelt Middle School	440	1	Generator Rm	4	4	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.22	0.09	0.13	132	53	79
Roosevelt Schools NY	Roosevelt Middle School	441	1	Generator Rm	1	1	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt Middle School	442	1	It Rm	6	6	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.33	0.13	0.20	198	79	119
Roosevelt Schools NY	Roosevelt Middle School	443	1	Electrical Rm	6	6	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.33	0.13	0.20	198	79	119
Roosevelt Schools NY	Roosevelt Middle School	444	1	Electrical Rm	1	1	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt Middle School	445	1	Electrical Rm	2	2	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	750	0.11	0.04	0.07	83	33	50
Roosevelt Schools NY	Roosevelt Middle School	446	1	Electrical Rm	1	1	0.0500	0.0500	Frog Eyes, 2X	will Not be Retrofit	8,760	0.05	0.05	-	438	438	-
Roosevelt Schools NY	Roosevelt Middle School	447	1	Conference Rm	6	6	0.0550	0.0220	2x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,500	0.33	0.13	0.20	825	330	495
Roosevelt Schools NY	Roosevelt Middle School	448	1	Hallway	4	4	0.0710	0.0350	2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	3,000	0.28	0.14	0.14	852	420	432
Roosevelt Schools NY	Roosevelt Middle School	449	1	Hallway	1	1	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt Middle School	450	1	Hallway	3	3	0.0720	0.0130	CF PL (2) 32w	LED Retrofit Can Kit, 6 Inch, HLO	3,000	0.22	0.04	0.18	648	117	531
Roosevelt Schools NY	Roosevelt Middle School	451	1	Storage	1	1	0.0550	0.0220	2x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.06	0.02	0.03	33	13	20
Roosevelt Schools NY	Roosevelt Middle School	452	1	Storage	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	750	0.66	0.26	0.40	495	198	297
Roosevelt Schools NY	Roosevelt Middle School	453	1	Storage	2	2	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt Middle School	454	1	Office	2	2	0.0550	0.0220	2x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,760	0.11	0.04	0.07	194	77	116
Roosevelt Schools NY	Roosevelt Middle School	455	1	Storage	2	2	0.0550	0.0220	2x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.11	0.04	0.07	66	26	40
Roosevelt Schools NY	Roosevelt Middle School	456	1	Womens Locker Room	1	1	0.0550	0.0220	2x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,760	0.06	0.02	0.03	97	39	58
Roosevelt Schools NY	Roosevelt Middle School	457	1	Womens Locker Room	2	2	0.0130	0.0060	CFL 13w	LED Lamp, A-Line, LLO	1,760	0.03	0.01	0.01	46	21	25
Roosevelt Schools NY	Roosevelt Middle School	458	1	Womens Locker Room	1	1	0.0320	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	1,760	0.03	0.02	0.02	56	28	28
Roosevelt Schools NY	Roosevelt Middle School	459	1	Mens Locker Room	1	1	0.0550	0.0220	2x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,760	0.06	0.02	0.03	97	39	58
Roosevelt Schools NY	Roosevelt Middle School	460	1	Mens Locker Room	2	2	0.0130	0.0060	CFL 13w	LED Lamp, A-Line, LLO	1,760	0.03	0.01	0.01	46	21	25
Roosevelt Schools NY	Roosevelt Middle School	461	1	Mens Locker Room	1	1	0.0320	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	1,760	0.03	0.02	0.02	56	28	28
Roosevelt Schools NY	Roosevelt Middle School	462	1	Kitchen	16	16	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,280	0.88	0.35	0.53	1,126	451	676
Roosevelt Schools NY	Roosevelt Middle School	463	1	Kitchen Range Hood	4	4	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,280	0.22	0.09	0.13	282	113	169

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Roosevelt Schools NY	Roosevelt Middle School	464	1	Kitchen	2	2	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt Middle School	465	1	Office	1	1	0.0550	0.0220	2x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,760	0.06	0.02	0.03	97	39	58
Roosevelt Schools NY	Roosevelt Middle School	466	1	Storage	2	2	0.0550	0.0220	2x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.11	0.04	0.07	66	26	40
Roosevelt Schools NY	Roosevelt Middle School	467	1	Jc	1	1	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	750	0.06	0.02	0.03	41	17	25
Roosevelt Schools NY	Roosevelt Middle School	468	1	Walk-in	4	4	0.1170	0.0500	1x4, 2-Lamp T5 HO	LED Int. Driver Lamp, (2) 4' T5 HO Lamps	750	0.47	0.20	0.27	351	150	201
Roosevelt Schools NY	Roosevelt Middle School	469	1	Walk-in	2	2	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	750	0.11	0.04	0.07	83	33	50
Roosevelt Schools NY	Roosevelt Middle School	470	1	Serving Line	2	2	0.0550	0.0220	2x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,600	0.11	0.04	0.07	176	70	106
Roosevelt Schools NY	Roosevelt Middle School	471	1	Serving Line	7	7	0.0550	0.0220	2x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,600	0.39	0.15	0.23	616	246	370
Roosevelt Schools NY	Roosevelt Middle School	472	1	Serving Line	12	12	0.0600	0.0100	Inc 60w	LED Lamp, A-Line, NLO	1,600	0.72	0.12	0.60	1,152	192	960
Roosevelt Schools NY	Roosevelt Middle School	473	1	Serving Line	2	2	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt Middle School	474	1	Trash Room	2	2	0.0550	0.0220	2x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,600	0.11	0.04	0.07	176	70	106
Roosevelt Schools NY	Roosevelt Middle School	475	1	Cafeteria	16	16	0.0200	0.0200	LED Fixture, 20W	will Not be Retrofit	3,351	0.32	0.32	-	1,072	1,072	-
Roosevelt Schools NY	Roosevelt Middle School	476	1	Cafeteria	12	12	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp, HI	3,351	0.74	0.30	0.44	2,493	1,005	1,488
Roosevelt Schools NY	Roosevelt Middle School	477	1	Cafeteria	33	33	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	3,351	1.19	0.40	0.79	3,981	1,327	2,654
Roosevelt Schools NY	Roosevelt Middle School	478	1	Cafeteria	6	6	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt Middle School	479	1	Cafeteria	2	2	0.0400	0.0400	Snack Vending Machine	will Not be Retrofit	8,760	0.08	0.08	-	701	701	-
Roosevelt Schools NY	Roosevelt Middle School	480	1	Cafeteria	1	1	0.3400	0.3400	Cold Drink Vending Machine	will Not be Retrofit	8,760	0.34	0.34	-	2,978	2,978	-
Roosevelt Schools NY	Roosevelt Middle School	481	1	Restroom, Womens	5	5	0.0360	0.0090	CF PL 32w	LED Retrofit Can Kit, 6 Inch, NLO	1,760	0.18	0.05	0.14	317	79	238
Roosevelt Schools NY	Roosevelt Middle School	482	1	Restroom, Womens	7	7	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XL	1,760	0.39	0.15	0.23	678	271	407
Roosevelt Schools NY	Roosevelt Middle School	483	1	Restroom, Womens	1	1	0.0450	0.0220	1x3, 2-Lamp T8	LED Int. Driver Lamps, (2) 3' Lamps, XL	1,760	0.05	0.02	0.02	79	39	40
Roosevelt Schools NY	Roosevelt Middle School	484	1	Jc	1	1	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.06	0.02	0.03	33	13	20
Roosevelt Schools NY	Roosevelt Middle School	485	1	Restroom, Mens	5	5	0.0360	0.0090	CF PL 32w	LED Retrofit Can Kit, 6 Inch, NLO	1,760	0.18	0.05	0.14	317	79	238
Roosevelt Schools NY	Roosevelt Middle School	486	1	Restroom, Mens	7	7	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XL	1,760	0.39	0.15	0.23	678	271	407
Roosevelt Schools NY	Roosevelt Middle School	487	1	Restroom, Mens	1	1	0.0450	0.0220	1x3, 2-Lamp T8	LED Int. Driver Lamps, (2) 3' Lamps, XL	1,760	0.05	0.02	0.02	79	39	40
Roosevelt Schools NY	Roosevelt Middle School	488	1	Hallway	21	21	0.2900	0.1000	MH 250w	LED Wallpack, Full Cutoff, 12000 Lumens	3,750	6.09	2.10	3.99	22,838	7,875	14,963
Roosevelt Schools NY	Roosevelt Middle School	489	1	Hallway	17	17	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	3,750	0.61	0.20	0.41	2,295	765	1,530
Roosevelt Schools NY	Roosevelt Middle School	490	1	Hallway	5	5	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt Middle School	491	SW	Stairwell	10	10	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,750	0.55	0.22	0.33	2,063	825	1,238
Roosevelt Schools NY	Roosevelt Middle School	492	SW	Stairwell	11	11	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, HI	3,750	0.61	0.24	0.36	2,269	908	1,361
Roosevelt Schools NY	Roosevelt Middle School	493	SW	Stairwell	1	1	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt Middle School	494	SW	Stairwell	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,750	0.66	0.26	0.40	2,475	990	1,485
Roosevelt Schools NY	Roosevelt Middle School	495	SW	Stairwell	1	1	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt Middle School	496	SW	Stairwell	6	6	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	3,750	0.22	0.07	0.14	810	270	540
Roosevelt Schools NY	Roosevelt Middle School	497	SW	Stairwell	2	2	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-

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Site Name	Building Name	Index	Floor	Location	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Roosevelt Schools NY	Roosevelt Middle School	498	SW	Stairwell	13	13	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,750	0.72	0.29	0.43	2,681	1,073	1,609
Roosevelt Schools NY	Roosevelt Middle School	499	SW	Stairwell	8	8	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,750	0.44	0.18	0.26	1,650	660	990
Roosevelt Schools NY	Roosevelt Middle School	500	SW	Stairwell	1	1	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt Middle School	501	SW	Stairwell	12	12	0.0550	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,750	0.66	0.26	0.40	2,475	990	1,485
Roosevelt Schools NY	Roosevelt Middle School	502	SW	Stairwell	1	1	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt Middle School	503	1	Foyer	5	5	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	3,750	0.18	0.06	0.12	675	225	450
Roosevelt Schools NY	Roosevelt Middle School	504	1	Foyer	11	11	0.0360	0.0120	CF PL 32w	LED Retrofit Can Kit, 8 Inch, NLO	3,750	0.40	0.13	0.26	1,485	495	990
Roosevelt Schools NY	Roosevelt Middle School	505	Ext	Location A	2	2	0.5900	0.2000	MH (2) 250w	(2) LED Shoebox, 12,000 Lumens, Type IV W, PC, AM, GRY	4,380	1.18	0.40	0.78	5,168	1,752	3,416
Roosevelt Schools NY	Roosevelt Middle School	506	Ext	Location B	41	41	0.0560	0.0230	CF PL (2) 26w	LED Wallpack, Full Cutoff, 3000 Lumens, PC, HC	4,380	2.30	0.94	1.35	10,056	4,130	5,926
Roosevelt Schools NY	Roosevelt Middle School	507	Ext	Location C	12	12	0.0560	0.0230	CF PL (2) 26w	LED Wallpack, Full Cutoff, 3000 Lumens, PC, HC, BB, WM30	4,380	0.67	0.28	0.40	2,943	1,209	1,734
Roosevelt Schools NY	Roosevelt Middle School	508	Ext	Location D	7	7	0.0600	0.0140	MH 50w	LED Corn Cob Lamp, 2,000LM	4,380	0.42	0.10	0.32	1,840	429	1,410
Roosevelt Schools NY	Roosevelt Middle School	509	Ext	Location E	10	10	0.2900	0.1000	MH 250w	LED Shoebox, 12,000 Lumens, Type IV W, PC, AM, GRY	4,380	2.90	1.00	1.90	12,702	4,380	8,322
Roosevelt Schools NY	Roosevelt Middle School	510	Ext	Location F	16	16	0.1300	0.0400	MH 100w	LED Canopy, 4000 Lumens	4,380	2.08	0.64	1.44	9,110	2,803	6,307
Roosevelt Schools NY	Roosevelt Middle School	511	Ext	Location G	4	4	0.2900	0.1000	MH 250w	LED Shoebox, 12,000 Lumens, Type IV W, PC, AM, GRY	4,380	1.16	0.40	0.76	5,081	1,752	3,329
Roosevelt Schools NY	Roosevelt Middle School	512	Ext	Location H	2	2	0.0300	0.0300	LED Fixture, 30W	will Not be Retrofit	4,380	0.06	0.06	-	263	263	-
Roosevelt Schools NY	Roosevelt Middle School	513	Ext	Location I	2	2	0.1300	0.0400	MH 100w	LED Wallpack, 2000 Lumen, PC, Round, Eyelid	4,380	0.26	0.08	0.18	1,139	350	788
Roosevelt Schools NY	Roosevelt Middle School	514	1	New Layout	66	66	-	-	New Layout	No Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Roosevelt Middle School	515	0	New Layout	2	2	-	0.0280	New Layout	LED Wallpack, Forward Throw, 2000 Lumens, BB, MW30	4,380	-	0.06	(0.06)	-	245	(245)
Roosevelt Schools NY	Ulysses Byas Elementary School	1	3	Utility Emr	1	1	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4	600	0.05	0.03	0.03	32	15	17
Roosevelt Schools NY	Ulysses Byas Elementary School	2	3	Classroom 3008	15	15	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,152	0.93	0.38	0.56	1,071	432	639
Roosevelt Schools NY	Ulysses Byas Elementary School	3	3	Classroom 3007	15	15	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,152	0.93	0.38	0.56	1,071	432	639
Roosevelt Schools NY	Ulysses Byas Elementary School	4	3	Classroom 3006	15	15	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,152	0.93	0.38	0.56	1,071	432	639
Roosevelt Schools NY	Ulysses Byas Elementary School	5	3	Staff Restroom	1	1	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	2,400	0.06	0.03	0.04	149	60	89
Roosevelt Schools NY	Ulysses Byas Elementary School	6	1	Classroom 3003	17	17	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	2,119	1.05	0.43	0.63	2,233	901	1,333
Roosevelt Schools NY	Ulysses Byas Elementary School	7	3	Classroom 3003b	1	1	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,152	0.06	0.03	0.04	71	29	43
Roosevelt Schools NY	Ulysses Byas Elementary School	8	3	Telcom 3041	2	2	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4, Jack Chain Mount	600	0.11	0.05	0.06	64	30	34
Roosevelt Schools NY	Ulysses Byas Elementary School	9	3	Electrical Room 3040	2	2	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4, Jack Chain Mount	600	0.11	0.05	0.06	64	30	34
Roosevelt Schools NY	Ulysses Byas Elementary School	10	3	Classroom 3038	16	16	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,152	0.99	0.40	0.59	1,143	461	682
Roosevelt Schools NY	Ulysses Byas Elementary School	11	3	Bathroom, Women's	5	5	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,400	0.27	0.11	0.16	641	264	377
Roosevelt Schools NY	Ulysses Byas Elementary School	12	3	Bathroom, Women's	6	6	0.0280	0.0130	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	2,400	0.17	0.08	0.09	403	187	216
Roosevelt Schools NY	Ulysses Byas Elementary School	13	3	Utility Jc1	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.05	0.02	0.03	32	13	19
Roosevelt Schools NY	Ulysses Byas Elementary School	14	3	Bathroom, Men's	5	5	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,400	0.27	0.11	0.16	641	264	377
Roosevelt Schools NY	Ulysses Byas Elementary School	15	3	Bathroom, Men's	6	6	0.0280	0.0130	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	2,400	0.17	0.08	0.09	403	187	216
Roosevelt Schools NY	Ulysses Byas Elementary School	16	3	Bathroom, Men's	1	1	0.0317	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps, XL	2,400	0.03	0.02	0.02	76	38	38

Roosevelt UFSD, NY
Exhibit D-5-1
ECM 1 - LED Lighting and Lighting Controls Upgrade
Lighting Line by Line

Site Name	Building Name	Index	Floor	Location	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Roosevelt Schools NY	Ulysses Byas Elementary School	17	3	Classroom 3033	15	15	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,152	0.93	0.38	0.56	1,071	432	639
Roosevelt Schools NY	Ulysses Byas Elementary School	18	3	Classroom 3032	15	15	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,152	0.93	0.38	0.56	1,071	432	639
Roosevelt Schools NY	Ulysses Byas Elementary School	19	3	Classroom 3031	15	15	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,152	0.93	0.38	0.56	1,071	432	639
Roosevelt Schools NY	Ulysses Byas Elementary School	20	3	Classroom 3030	15	15	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,152	0.93	0.38	0.56	1,071	432	639
Roosevelt Schools NY	Ulysses Byas Elementary School	21	3	Classroom 3029	17	17	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,152	1.05	0.43	0.63	1,214	490	725
Roosevelt Schools NY	Ulysses Byas Elementary School	22	3	Classroom 3028	18	18	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,152	1.12	0.45	0.67	1,286	518	767
Roosevelt Schools NY	Ulysses Byas Elementary School	23	3	Classroom 3027	17	17	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,152	1.05	0.43	0.63	1,214	490	725
Roosevelt Schools NY	Ulysses Byas Elementary School	24	3	Classroom 3026	17	17	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,152	1.05	0.43	0.63	1,214	490	725
Roosevelt Schools NY	Ulysses Byas Elementary School	25	3	Classroom 3025	17	17	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,152	1.05	0.43	0.63	1,214	490	725
Roosevelt Schools NY	Ulysses Byas Elementary School	26	3	Classroom 3024	17	17	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,152	1.05	0.43	0.63	1,214	490	725
Roosevelt Schools NY	Ulysses Byas Elementary School	27	3	Classroom 3023	8	8	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,152	0.50	0.20	0.30	571	230	341
Roosevelt Schools NY	Ulysses Byas Elementary School	28	3	Classroom 3021	16	16	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,152	0.99	0.40	0.59	1,143	461	682
Roosevelt Schools NY	Ulysses Byas Elementary School	29	3	Office 3020	3	3	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,760	0.19	0.08	0.11	327	132	195
Roosevelt Schools NY	Ulysses Byas Elementary School	30	3	Office 3020	3	3	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,760	0.19	0.08	0.11	327	132	195
Roosevelt Schools NY	Ulysses Byas Elementary School	31	3	Office 3019	2	2	0.0360	0.0090	CF PL 32w	LED Retrofit Can Kit, 6 Inch, NLO	2,200	0.07	0.02	0.05	158	40	119
Roosevelt Schools NY	Ulysses Byas Elementary School	32	3	Office 3018	5	5	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,760	0.31	0.13	0.19	546	220	326
Roosevelt Schools NY	Ulysses Byas Elementary School	33	3	Classroom 3017	17	17	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,152	1.05	0.43	0.63	1,214	490	725
Roosevelt Schools NY	Ulysses Byas Elementary School	34	3	Classroom 3016	17	17	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,152	1.05	0.43	0.63	1,214	490	725
Roosevelt Schools NY	Ulysses Byas Elementary School	35	3	Utility 3015	6	6	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4, Jack Chain Mount	600	0.32	0.15	0.17	192	90	102
Roosevelt Schools NY	Ulysses Byas Elementary School	36	3	Utility 3014	12	12	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4, Jack Chain Mount	600	0.64	0.30	0.34	384	180	204
Roosevelt Schools NY	Ulysses Byas Elementary School	37	3	Classroom 3010	23	23	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,152	1.43	0.58	0.85	1,643	662	980
Roosevelt Schools NY	Ulysses Byas Elementary School	38	3	Classroom 3010	11	11	0.0600	0.0110	Halogen 60w	LED Lamp, R/PAR30, NLO	1,600	0.66	0.12	0.54	1,056	194	862
Roosevelt Schools NY	Ulysses Byas Elementary School	39	3	Hallway H1 H1	58	58	0.0380	0.0145	1x4, 1-Lamp T5E	LED Int. Driver Lamp, (1) 4' T5 HE Lamp	3,000	2.20	0.84	1.36	6,612	2,523	4,089
Roosevelt Schools NY	Ulysses Byas Elementary School	40	3	Hallway H1 H1	10	10	0.0380	0.0145	1x4, 1-Lamp T5E, EM	LED Int. Driver Lamp, (1) 4' T5 HE Lamp	8,760	0.38	0.15	0.24	3,329	1,270	2,059
Roosevelt Schools NY	Ulysses Byas Elementary School	41	3	Display H1	6	6	0.0400	0.0110	1x3, 1-Lamp T12	LED Int. Driver Lamp, (1) 3' Lamp	3,000	0.24	0.07	0.17	720	198	522
Roosevelt Schools NY	Ulysses Byas Elementary School	42	3	Hallway H1	4	4	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Ulysses Byas Elementary School	43	3	Classroom 3033	15	15	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,152	0.93	0.38	0.56	1,071	432	639
Roosevelt Schools NY	Ulysses Byas Elementary School	44	2	Utility 2013	2	2	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	600	0.12	0.05	0.07	74	30	44
Roosevelt Schools NY	Ulysses Byas Elementary School	45	2	Classroom 2012	21	21	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,152	1.30	0.53	0.78	1,500	605	895
Roosevelt Schools NY	Ulysses Byas Elementary School	46	2	Classroom 2011	13	13	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	2,119	0.81	0.33	0.48	1,708	689	1,019
Roosevelt Schools NY	Ulysses Byas Elementary School	47	2	Classroom 2011b	1	1	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,600	0.06	0.03	0.04	99	40	59
Roosevelt Schools NY	Ulysses Byas Elementary School	48	2	Classroom 2009	15	15	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,152	0.93	0.38	0.56	1,071	432	639
Roosevelt Schools NY	Ulysses Byas Elementary School	49	2	Classroom 2008	15	15	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	2,119	0.93	0.38	0.56	1,971	795	1,176
Roosevelt Schools NY	Ulysses Byas Elementary School	50	2	Classroom 2008b	1	1	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,600	0.06	0.03	0.04	99	40	59

Roosevelt UFSD, NY
Exhibit D-5-1
ECM 1 - LED Lighting and Lighting Controls Upgrade
Lighting Line by Line

Site Name	Building Name	Index	Floor	Location	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Roosevelt Schools NY	Ulysses Byas Elementary School	51	2	Storage 2005	9	9	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	600	0.56	0.23	0.33	335	135	200
Roosevelt Schools NY	Ulysses Byas Elementary School	52	2	Storage 2005d	6	6	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	600	0.37	0.15	0.22	223	90	133
Roosevelt Schools NY	Ulysses Byas Elementary School	53	2	Storage 2005b	1	1	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	600	0.06	0.03	0.04	37	15	22
Roosevelt Schools NY	Ulysses Byas Elementary School	54	2	Office	3	3	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	3,200	0.19	0.08	0.11	595	240	355
Roosevelt Schools NY	Ulysses Byas Elementary School	55	2	Library 2001	35	35	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp, HI	1,472	2.17	0.88	1.30	3,194	1,288	1,906
Roosevelt Schools NY	Ulysses Byas Elementary School	56	2	Library 2001	10	10	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,472	0.62	0.25	0.37	913	368	545
Roosevelt Schools NY	Ulysses Byas Elementary School	57	2	Library	11	11	0.0280	0.0090	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	1,472	0.31	0.10	0.21	453	146	308
Roosevelt Schools NY	Ulysses Byas Elementary School	58	2	Library 2001	2	2	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Ulysses Byas Elementary School	58.1	2	Library 2001	12	12	0.0280	0.0130	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	1,472	0.34	0.16	0.18	495	230	265
Roosevelt Schools NY	Ulysses Byas Elementary School	59	2	Utility 2048	2	2	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4, Jack Chain Mount	600	0.11	0.05	0.06	64	30	34
Roosevelt Schools NY	Ulysses Byas Elementary School	60	2	Utility 2048	2	2	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4, Jack Chain Mount	600	0.11	0.05	0.06	64	30	34
Roosevelt Schools NY	Ulysses Byas Elementary School	61	2	Conference Rm 2024	5	5	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,760	0.31	0.13	0.19	546	220	326
Roosevelt Schools NY	Ulysses Byas Elementary School	62	2	Conference Rm 2024a	3	3	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,760	0.19	0.08	0.11	327	132	195
Roosevelt Schools NY	Ulysses Byas Elementary School	63	2	Conference Rm 2024b	3	3	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,760	0.19	0.08	0.11	327	132	195
Roosevelt Schools NY	Ulysses Byas Elementary School	64	2	Conference Rm 2024c	2	2	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,760	0.12	0.05	0.07	218	88	130
Roosevelt Schools NY	Ulysses Byas Elementary School	65	2	Conference Rm 2024d	2	2	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,760	0.12	0.05	0.07	218	88	130
Roosevelt Schools NY	Ulysses Byas Elementary School	66	2	Bathroom, Women's GR2	5	5	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,400	0.27	0.11	0.16	641	264	377
Roosevelt Schools NY	Ulysses Byas Elementary School	67	2	Bathroom, Women's GR2	1	1	0.0317	0.0160	1x2, 2-Lamp T8	LED Int. Driver Lamps, (2) 2' Lamps	2,400	0.03	0.02	0.02	76	38	38
Roosevelt Schools NY	Ulysses Byas Elementary School	68	2	Bathroom, Women's	6	6	0.0280	0.0130	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	2,400	0.17	0.08	0.09	403	187	216
Roosevelt Schools NY	Ulysses Byas Elementary School	69	2	Utility Jc2	1	1	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4, Jack Chain Mount	600	0.05	0.03	0.03	32	15	17
Roosevelt Schools NY	Ulysses Byas Elementary School	70	2	Bathroom, Men's BR2	6	6	0.0280	0.0130	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	2,400	0.17	0.08	0.09	403	187	216
Roosevelt Schools NY	Ulysses Byas Elementary School	71	2	Bathroom, Men's BR2	5	5	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XL	2,400	0.27	0.11	0.16	641	264	377
Roosevelt Schools NY	Ulysses Byas Elementary School	72	2	Bathroom, Men's BR2	1	1	0.0445	0.0220	1x3, 2-Lamp T8	LED Int. Driver Lamps, (2) 3' Lamps, XL	2,400	0.04	0.02	0.02	107	53	54
Roosevelt Schools NY	Ulysses Byas Elementary School	73	2	Classroom 2037	15	15	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,152	0.93	0.38	0.56	1,071	432	639
Roosevelt Schools NY	Ulysses Byas Elementary School	74	2	Classroom 2036	14	14	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,152	0.87	0.35	0.52	1,000	403	597
Roosevelt Schools NY	Ulysses Byas Elementary School	75	2	Classroom 2035	15	15	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,152	0.93	0.38	0.56	1,071	432	639
Roosevelt Schools NY	Ulysses Byas Elementary School	76	2	Classroom 2034	15	15	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,152	0.93	0.38	0.56	1,071	432	639
Roosevelt Schools NY	Ulysses Byas Elementary School	77	2	Classroom 2033	15	15	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,152	0.93	0.38	0.56	1,071	432	639
Roosevelt Schools NY	Ulysses Byas Elementary School	78	2	Classroom 2032	12	12	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,152	0.74	0.30	0.44	857	346	511
Roosevelt Schools NY	Ulysses Byas Elementary School	79	2	Storage 2030	2	2	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	600	0.12	0.05	0.07	74	30	44
Roosevelt Schools NY	Ulysses Byas Elementary School	80	2	Classroom 2031	11	11	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,152	0.68	0.28	0.41	786	317	469
Roosevelt Schools NY	Ulysses Byas Elementary School	81	2	Office 2029	3	3	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	3,200	0.19	0.08	0.11	595	240	355
Roosevelt Schools NY	Ulysses Byas Elementary School	82	2	Classroom 2020	6	6	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,152	0.37	0.15	0.22	429	173	256
Roosevelt Schools NY	Ulysses Byas Elementary School	83	2	Classroom 2027	14	14	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	2,119	0.87	0.35	0.52	1,839	742	1,098

Roosevelt UFSD, NY
Exhibit D-5-1
ECM 1 - LED Lighting and Lighting Controls Upgrade
Lighting Line by Line

Site Name	Building Name	Index	Floor	Location	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Roosevelt Schools NY	Ulysses Byas Elementary School	84	2	Classroom 2027b	2	2	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,600	0.12	0.05	0.07	198	80	118
Roosevelt Schools NY	Ulysses Byas Elementary School	85	2	Classroom 2025	16	16	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,152	0.99	0.40	0.59	1,143	461	682
Roosevelt Schools NY	Ulysses Byas Elementary School	86	2	Office 2023	18	18	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,760	1.12	0.45	0.67	1,964	792	1,172
Roosevelt Schools NY	Ulysses Byas Elementary School	87	2	Staff Restroom	1	1	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	704	0.06	0.03	0.04	44	18	26
Roosevelt Schools NY	Ulysses Byas Elementary School	88	2	Utility JC3	2	2	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4, Jack Chain Mount	600	0.11	0.05	0.06	64	30	34
Roosevelt Schools NY	Ulysses Byas Elementary School	89	2	Storage 2018A	1	1	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	600	0.06	0.03	0.04	37	15	22
Roosevelt Schools NY	Ulysses Byas Elementary School	90	2	Office 2019	2	2	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,760	0.12	0.05	0.07	218	88	130
Roosevelt Schools NY	Ulysses Byas Elementary School	91	2	Classroom 2018	7	7	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,152	0.43	0.18	0.26	500	202	298
Roosevelt Schools NY	Ulysses Byas Elementary School	92	2	Classroom 2017	17	17	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	2,119	1.05	0.43	0.63	2,233	901	1,333
Roosevelt Schools NY	Ulysses Byas Elementary School	93	2	Classroom 2017b	1	1	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,600	0.06	0.03	0.04	99	40	59
Roosevelt Schools NY	Ulysses Byas Elementary School	94	2	Classroom 2015	17	17	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,152	1.05	0.43	0.63	1,214	490	725
Roosevelt Schools NY	Ulysses Byas Elementary School	95	2	Classroom 2014a	6	6	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,152	0.37	0.15	0.22	429	173	256
Roosevelt Schools NY	Ulysses Byas Elementary School	96	2	Storage 2014	7	7	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	600	0.43	0.18	0.26	260	105	155
Roosevelt Schools NY	Ulysses Byas Elementary School	97	2	Hallways H2	72	72	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	3,000	4.46	1.80	2.66	13,392	5,400	7,992
Roosevelt Schools NY	Ulysses Byas Elementary School	98	2	Hallways H2	8	8	0.0280	0.0130	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	3,000	0.22	0.10	0.12	672	312	360
Roosevelt Schools NY	Ulysses Byas Elementary School	99	2	Hallway H2	6	6	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Ulysses Byas Elementary School	100	1	Gym	22	22	0.2880	0.0870	CF PL (8) 32w	LED High Bay, 13K Lumens, 2x2, OSF, WG, PM	2,500	6.34	1.91	4.42	15,840	4,785	11,055
Roosevelt Schools NY	Ulysses Byas Elementary School	100.1	1	Gym	2	2	0.2880	0.0870	CF PL (8) 32w	LED High Bay, 13K Lumens, 2x2, OSF, WG, PM	8,760	0.58	0.17	0.40	5,046	1,524	3,522
Roosevelt Schools NY	Ulysses Byas Elementary School	101	1	Gym Storage	4	4	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4	750	0.21	0.10	0.11	160	75	85
Roosevelt Schools NY	Ulysses Byas Elementary School	102	1	Stage ST	8	8	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4, Jack Chain Mount	1,080	0.43	0.20	0.23	461	216	245
Roosevelt Schools NY	Ulysses Byas Elementary School	103	1	Stage ST	3	3	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, HI	1,080	0.16	0.07	0.09	173	71	102
Roosevelt Schools NY	Ulysses Byas Elementary School	104	1	Gym Storage	2	2	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4	600	0.11	0.05	0.06	64	30	34
Roosevelt Schools NY	Ulysses Byas Elementary School	105	1	Jc Storage 1	4	4	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	600	0.25	0.10	0.15	149	60	89
Roosevelt Schools NY	Ulysses Byas Elementary School	106	1	Jc Storage 2	3	3	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	600	0.19	0.08	0.11	112	45	67
Roosevelt Schools NY	Ulysses Byas Elementary School	107	1	Office 1016	2	2	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	3,200	0.12	0.05	0.07	397	160	237
Roosevelt Schools NY	Ulysses Byas Elementary School	108	1	Office 1017	2	2	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	3,200	0.12	0.05	0.07	397	160	237
Roosevelt Schools NY	Ulysses Byas Elementary School	109	1	Storage 1013	2	2	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.11	0.04	0.06	64	26	38
Roosevelt Schools NY	Ulysses Byas Elementary School	110	1	Walk-in 1009	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XL	1,600	0.05	0.02	0.03	85	35	50
Roosevelt Schools NY	Ulysses Byas Elementary School	111	1	Kitchen 1009	9	9	0.1057	0.0440	2x4, 4-Lamp T8	LED Int. Driver Lamps, (4) 4' Lamps	1,280	0.95	0.40	0.56	1,218	507	711
Roosevelt Schools NY	Ulysses Byas Elementary School	112	1	Kitchen 1009	6	6	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,280	0.37	0.15	0.22	476	192	284
Roosevelt Schools NY	Ulysses Byas Elementary School	113	1	Utility SS	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.05	0.02	0.03	32	13	19
Roosevelt Schools NY	Ulysses Byas Elementary School	114	1	Office 1010	2	2	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	3,200	0.12	0.05	0.07	397	160	237
Roosevelt Schools NY	Ulysses Byas Elementary School	115	1	Ovenhood 1009	3	3	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,600	0.16	0.07	0.09	256	106	151
Roosevelt Schools NY	Ulysses Byas Elementary School	116	1	Cafeteria 1008	9	9	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	5,725	0.56	0.23	0.33	3,195	1,288	1,906

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Roosevelt Schools NY	Ulysses Byas Elementary School	117	1	Cafeteria 1005	52	52	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	864	3.22	1.30	1.92	2,786	1,123	1,662
Roosevelt Schools NY	Ulysses Byas Elementary School	118	1	Cafeteria 1005	1	1	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Ulysses Byas Elementary School	119	1	Telcom 1071	2	2	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4, Jack Chain Mount	600	0.11	0.05	0.06	64	30	34
Roosevelt Schools NY	Ulysses Byas Elementary School	120	1	Electrical 1070	2	2	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4, Jack Chain Mount	600	0.11	0.05	0.06	64	30	34
Roosevelt Schools NY	Ulysses Byas Elementary School	121	1	Storage 1063a	2	2	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.11	0.04	0.06	64	26	38
Roosevelt Schools NY	Ulysses Byas Elementary School	122	1	Office 1067	4	4	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	704	0.25	0.10	0.15	175	70	104
Roosevelt Schools NY	Ulysses Byas Elementary School	123	1	Office 1066	4	4	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	704	0.25	0.10	0.15	175	70	104
Roosevelt Schools NY	Ulysses Byas Elementary School	124	1	Toilet 1065	2	2	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	704	0.12	0.05	0.07	87	35	52
Roosevelt Schools NY	Ulysses Byas Elementary School	125	1	Office 1063	4	4	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	3,200	0.25	0.10	0.15	794	320	474
Roosevelt Schools NY	Ulysses Byas Elementary School	126	1	Office 1063	3	3	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,200	0.16	0.07	0.09	513	211	301
Roosevelt Schools NY	Ulysses Byas Elementary School	127	1	Classroom 1062	15	15	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,152	0.93	0.38	0.56	1,071	432	639
Roosevelt Schools NY	Ulysses Byas Elementary School	128	1	Classroom 1062	1	1	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	2,400	0.06	0.03	0.04	149	60	89
Roosevelt Schools NY	Ulysses Byas Elementary School	129	1	Classroom 1060	15	15	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,152	0.93	0.38	0.56	1,071	432	639
Roosevelt Schools NY	Ulysses Byas Elementary School	130	1	Classroom 1059	15	15	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,152	0.93	0.38	0.56	1,071	432	639
Roosevelt Schools NY	Ulysses Byas Elementary School	131	1	Classroom 1059	1	1	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	2,400	0.06	0.03	0.04	149	60	89
Roosevelt Schools NY	Ulysses Byas Elementary School	132	1	Classroom 1057	15	15	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,152	0.93	0.38	0.56	1,071	432	639
Roosevelt Schools NY	Ulysses Byas Elementary School	133	1	Classroom 1055	15	15	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,152	0.93	0.38	0.56	1,071	432	639
Roosevelt Schools NY	Ulysses Byas Elementary School	134	1	Classroom 1055	1	1	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	2,400	0.06	0.03	0.04	149	60	89
Roosevelt Schools NY	Ulysses Byas Elementary School	135	1	Classroom 1053	16	16	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	2,119	0.99	0.40	0.59	2,102	848	1,254
Roosevelt Schools NY	Ulysses Byas Elementary School	136	1	Classroom 1053	1	1	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	2,400	0.06	0.03	0.04	149	60	89
Roosevelt Schools NY	Ulysses Byas Elementary School	137	1	Classroom 1051	16	16	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,152	0.99	0.40	0.59	1,143	461	682
Roosevelt Schools NY	Ulysses Byas Elementary School	138	1	Classroom 1050	17	17	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,152	1.05	0.43	0.63	1,214	490	725
Roosevelt Schools NY	Ulysses Byas Elementary School	139	1	Classroom 1050	1	1	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	2,400	0.06	0.03	0.04	149	60	89
Roosevelt Schools NY	Ulysses Byas Elementary School	140	1	Classroom 1048	17	17	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,152	1.05	0.43	0.63	1,214	490	725
Roosevelt Schools NY	Ulysses Byas Elementary School	141	1	Classroom 1048	1	1	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	2,400	0.06	0.03	0.04	149	60	89
Roosevelt Schools NY	Ulysses Byas Elementary School	142	1	Classroom 1046	17	17	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	1,152	1.05	0.43	0.63	1,214	490	725
Roosevelt Schools NY	Ulysses Byas Elementary School	143	1	Classroom 1046	1	1	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	2,400	0.06	0.03	0.04	149	60	89
Roosevelt Schools NY	Ulysses Byas Elementary School	144	1	Office 1040	7	7	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	2,400	0.43	0.18	0.26	1,042	420	622
Roosevelt Schools NY	Ulysses Byas Elementary School	145	1	Hallway 1040	2	2	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	3,000	0.12	0.05	0.07	372	150	222
Roosevelt Schools NY	Ulysses Byas Elementary School	146	1	Office 1039	4	4	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	3,200	0.25	0.10	0.15	794	320	474
Roosevelt Schools NY	Ulysses Byas Elementary School	147	1	Office 1038	6	6	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	3,200	0.37	0.15	0.22	1,190	480	710
Roosevelt Schools NY	Ulysses Byas Elementary School	148	1	Office 1037	4	4	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	3,200	0.25	0.10	0.15	794	320	474
Roosevelt Schools NY	Ulysses Byas Elementary School	149	1	Office 1036	2	2	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	3,200	0.12	0.05	0.07	397	160	237
Roosevelt Schools NY	Ulysses Byas Elementary School	150	1	Staff Restroom Sr1	1	1	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	3,200	0.06	0.03	0.04	198	80	118

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Roosevelt Schools NY	Ulysses Byas Elementary School	151	1	Staff Restroom Sr2	1	1	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	704	0.06	0.03	0.04	44	18	26
Roosevelt Schools NY	Ulysses Byas Elementary School	152	1	Staff Restroom Sr	1	1	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	704	0.06	0.03	0.04	44	18	26
Roosevelt Schools NY	Ulysses Byas Elementary School	153	1	Girls Locker Room	2	2	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	2,400	0.12	0.05	0.07	298	120	178
Roosevelt Schools NY	Ulysses Byas Elementary School	154	1	Girls Locker Room	2	2	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XL	2,400	0.11	0.04	0.06	256	106	151
Roosevelt Schools NY	Ulysses Byas Elementary School	155	1	Girls Locker Room	2	2	0.0445	0.0220	1x3, 2-Lamp T8	LED Int. Driver Lamps, (2) 3' Lamps, XL	2,400	0.09	0.04	0.05	214	106	108
Roosevelt Schools NY	Ulysses Byas Elementary School	156	1	Girls Locker Room	4	4	0.0280	0.0090	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	2,400	0.11	0.04	0.08	269	86	182
Roosevelt Schools NY	Ulysses Byas Elementary School	157	1	Boys Locker Room	2	2	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	2,400	0.12	0.05	0.07	298	120	178
Roosevelt Schools NY	Ulysses Byas Elementary School	158	1	Boys Locker Room	2	2	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XL	2,400	0.11	0.04	0.06	256	106	151
Roosevelt Schools NY	Ulysses Byas Elementary School	159	1	Boys Locker Room	2	2	0.0445	0.0220	1x3, 2-Lamp T8	LED Int. Driver Lamps, (2) 3' Lamps, XL	2,400	0.09	0.04	0.05	214	106	108
Roosevelt Schools NY	Ulysses Byas Elementary School	160	1	Boys Locker Room	4	4	0.0280	0.0090	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	2,400	0.11	0.04	0.08	269	86	182
Roosevelt Schools NY	Ulysses Byas Elementary School	161	1	Utility MR	12	12	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4, Jack Chain Mount	600	0.64	0.30	0.34	384	180	204
Roosevelt Schools NY	Ulysses Byas Elementary School	162	1	Storage 1005	2	2	0.0534	0.0220	2x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.11	0.04	0.06	64	26	38
Roosevelt Schools NY	Ulysses Byas Elementary School	163	1	Girls Room	2	2	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XL	2,400	0.11	0.04	0.06	256	106	151
Roosevelt Schools NY	Ulysses Byas Elementary School	164	1	Girls Room	2	2	0.0445	0.0220	1x3, 2-Lamp T8	LED Int. Driver Lamps, (2) 3' Lamps, XL	2,400	0.09	0.04	0.05	214	106	108
Roosevelt Schools NY	Ulysses Byas Elementary School	165	1	Girls Room	5	5	0.0280	0.0090	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	2,400	0.14	0.05	0.10	336	108	228
Roosevelt Schools NY	Ulysses Byas Elementary School	166	1	Boys Room	2	2	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XL	2,400	0.11	0.04	0.06	256	106	151
Roosevelt Schools NY	Ulysses Byas Elementary School	167	1	Boys Room	2	2	0.0445	0.0220	1x3, 2-Lamp T8	LED Int. Driver Lamps, (2) 3' Lamps, XL	2,400	0.09	0.04	0.05	214	106	108
Roosevelt Schools NY	Ulysses Byas Elementary School	168	1	Boys Room	5	5	0.0280	0.0090	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	2,400	0.14	0.05	0.10	336	108	228
Roosevelt Schools NY	Ulysses Byas Elementary School	169	1	Hallways H1	29	29	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	3,000	1.80	0.73	1.07	5,394	2,175	3,219
Roosevelt Schools NY	Ulysses Byas Elementary School	170	1	Hallways H1	5	5	0.0620	0.0250	1x4, 1-Lamp T5H, EM	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	3,000	0.31	0.13	0.19	930	375	555
Roosevelt Schools NY	Ulysses Byas Elementary School	171	1	Hallways H1	3	3	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Ulysses Byas Elementary School	172	1	Lobby	38	38	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	2,000	2.36	0.95	1.41	4,712	1,900	2,812
Roosevelt Schools NY	Ulysses Byas Elementary School	173	1	Lobby	8	8	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Ulysses Byas Elementary School	174	1	Hallways H2	26	26	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	3,000	1.61	0.65	0.96	4,836	1,950	2,886
Roosevelt Schools NY	Ulysses Byas Elementary School	175	1	Hallways H2	2	2	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Ulysses Byas Elementary School	176	1	Hallways H3	19	19	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	3,000	1.18	0.48	0.70	3,534	1,425	2,109
Roosevelt Schools NY	Ulysses Byas Elementary School	177	1	Hallways H3	2	2	-	-	Exit Sign - LED	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Ulysses Byas Elementary School	178	1	Stairwells A	3	3	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	3,750	0.19	0.08	0.11	698	281	416
Roosevelt Schools NY	Ulysses Byas Elementary School	179	1	Stairwell A	3	3	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,750	0.16	0.07	0.09	601	248	353
Roosevelt Schools NY	Ulysses Byas Elementary School	180	1	Stairwell B	5	5	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	3,750	0.31	0.13	0.19	1,163	469	694
Roosevelt Schools NY	Ulysses Byas Elementary School	181	1	Stairwell B	3	3	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,750	0.16	0.07	0.09	601	248	353
Roosevelt Schools NY	Ulysses Byas Elementary School	182	1	Stairwell C	3	3	0.0620	0.0250	1x4, 1-Lamp T5H	LED Int. Driver Lamp, (1) 4' T5 HO Lamp	3,750	0.19	0.08	0.11	698	281	416
Roosevelt Schools NY	Ulysses Byas Elementary School	183	1	Stairwell C	3	3	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,750	0.16	0.07	0.09	601	248	353
Roosevelt Schools NY	Ulysses Byas Elementary School	184	Ext	Wall Packs M	16	16	0.0900	0.0400	MH 70w	LED Wallpack, Full Cutoff, 4000 Lumens, PH	4,380	1.44	0.64	0.80	6,307	2,803	3,504

Roosevelt UFSD, NY
Exhibit D-5-1
ECM 1 - LED Lighting and Lighting Controls Upgrade
Lighting Line by Line

Site Name	Building Name	Index	Floor	Location	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Roosevelt Schools NY	Ulysses Byas Elementary School	186	Ext	Wall Packs Mnl	9	9	0.0900	0.0230	MH 70w	LED Wallpack, Full Cutoff, 3000 Lumens, PC, HC	4,380	0.81	0.21	0.60	3,548	907	2,641
Roosevelt Schools NY	Ulysses Byas Elementary School	187	Ext	Walk Way Poles P	8	8	0.0500	0.0500	1x4, 1-Lamp T12, HO	will Not be Retrofit	4,380	0.40	0.40	-	1,752	1,752	-
Roosevelt Schools NY	Ulysses Byas Elementary School	188	Ext	Bus Lot Poles P2	2	2	0.4600	0.1000	MH 400w	LED Shoebox, 12,000 Lumens, Type IV W, PC, AM	4,380	0.92	0.20	0.72	4,030	876	3,154
Roosevelt Schools NY	Ulysses Byas Elementary School	189	Ext	Sign Flood S	1	1	0.4600	0.1200	MH 400w	LED Flood Light ~15,000 Lumens, Yoke Mount, PC, MM	4,380	0.46	0.12	0.34	2,015	526	1,489
Roosevelt Schools NY	Ulysses Byas Elementary School	190	1	New Layout	53	53	-	-	New Layout	No Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Ulysses Byas Elementary School	191	0	New Layout	4	4	-	-	New Layout	No Retrofit	4,380	-	-	-	-	-	-
Roosevelt Schools NY	Washington-Rose Elementary School	184	Ext	Exterior Wall Packs M	24	24	0.0900	0.0230	MH 70w	LED Wallpack, Full Cutoff, 3000 Lumens, PC, HC	4,380	2.16	0.55	1.61	9,461	2,418	7,043
Roosevelt Schools NY	Washington-Rose Elementary School	185	Ext	Egress Doors No Emergency Lighting Nl	15	15	-	0.0280	New Layout	LED Wallpack, Forward Throw, 2000 Lumens, BB, MW30	30	-	0.42	(0.42)	-	13	(13)
Roosevelt Schools NY	Washington-Rose Elementary School	186	Ext	Canopy Recessed C1	21	21	0.0720	0.0400	CF PL (2) 32w	LED Canopy, 2000 Lumens, Surface Mount, MM	4,380	1.51	0.84	0.67	6,623	3,679	2,943
Roosevelt Schools NY	Washington-Rose Elementary School	187	Ext	Canopy Recessed C2	26	26	0.0360	0.0200	CF PL 32w	LED Canopy, 2000 Lumens, MM, XL	4,380	0.94	0.52	0.42	4,100	2,278	1,822
Roosevelt Schools NY	Washington-Rose Elementary School	188	Ext	Recessed Canopy Troffers F3	8	8	0.0850	0.0290	1x3, 2-Lamp T5H	LED Int. Driver Lamp, (2) 3' T5 HO Lamps	4,380	0.68	0.23	0.45	2,978	1,016	1,962
Roosevelt Schools NY	Washington-Rose Elementary School	189	Ext	Parking Lot Poles P	3	3	0.4600	0.1000	MH 400w	LED Shoebox, 12,000 Lumens, Type IV W, PC, AM	4,380	1.38	0.30	1.08	6,044	1,314	4,730
Roosevelt Schools NY	Washington-Rose Elementary School	190	Ext	Sign Uplights S	2	2	0.0900	0.0300	MH 70w	LED Flood Light ~3,000 Lumens, Photocell, YK	4,380	0.18	0.06	0.12	788	263	526
Roosevelt Schools NY	Washington-Rose Elementary School	191	Ext	In Ground Flag Lights F	3	3	0.0900	0.0900	MH 70w	will Not be Retrofit	4,380	0.27	0.27	-	1,183	1,183	-
Roosevelt Schools NY	Washington-Rose Elementary School	192	3	Classroom 3007	10	10	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	1,152	0.31	0.22	0.09	357	253	104
Roosevelt Schools NY	Washington-Rose Elementary School	193	3	Classroom 3007	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	73	32	41
Roosevelt Schools NY	Washington-Rose Elementary School	194	3	Classroom 3007b Bathroom	2	2	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	2,400	0.13	0.06	0.07	303	134	169
Roosevelt Schools NY	Washington-Rose Elementary School	195	3	Classroom 3007	2	2	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	1,152	0.06	0.04	0.02	71	51	21
Roosevelt Schools NY	Washington-Rose Elementary School	196	3	Office 3011	6	6	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	2,200	0.43	0.21	0.22	937	462	475
Roosevelt Schools NY	Washington-Rose Elementary School	197	3	Classroom 3012	10	10	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	1,152	0.31	0.22	0.09	357	253	104
Roosevelt Schools NY	Washington-Rose Elementary School	198	3	Classroom 3012	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	73	32	41
Roosevelt Schools NY	Washington-Rose Elementary School	199	3	Utility El2	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	750	0.05	0.02	0.03	40	17	24
Roosevelt Schools NY	Washington-Rose Elementary School	200	3	Classroom 3014	15	15	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	1,152	0.47	0.33	0.14	536	380	156
Roosevelt Schools NY	Washington-Rose Elementary School	201	3	Classroom 3014	2	2	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.13	0.06	0.07	146	65	81
Roosevelt Schools NY	Washington-Rose Elementary School	202	3	Bathroom, Men's	9	9	0.0560	0.0170	CF PL (2) 26w	LED Retrofit Can Kit, 8 Inch, HLO	2,400	0.50	0.15	0.35	1,210	367	842
Roosevelt Schools NY	Washington-Rose Elementary School	203	3	Bathroom, Men's	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,400	0.05	0.02	0.03	128	53	75
Roosevelt Schools NY	Washington-Rose Elementary School	204	3	Utility Jc1	2	2	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	750	0.11	0.04	0.06	80	33	47
Roosevelt Schools NY	Washington-Rose Elementary School	205	3	Bathroom ,women's Gr1	9	9	0.0560	0.0170	CF PL (2) 26w	LED Retrofit Can Kit, 8 Inch, HLO	2,400	0.50	0.15	0.35	1,210	367	842
Roosevelt Schools NY	Washington-Rose Elementary School	206	3	Bathroom, Women's Gr1	1	1	0.0310	0.0460	LED Fixture, 1424 BR	LED Vanity, NLO, 1x4	2,400	0.03	0.05	(0.02)	74	110	(36)
Roosevelt Schools NY	Washington-Rose Elementary School	207	3	Facility Room 3019	8	8	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	1,152	0.25	0.18	0.07	286	203	83
Roosevelt Schools NY	Washington-Rose Elementary School	208	3	Facility Room 3019	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	73	32	41
Roosevelt Schools NY	Washington-Rose Elementary School	209	3	Facility Room 3019b	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	2,400	0.06	0.03	0.04	152	67	84
Roosevelt Schools NY	Washington-Rose Elementary School	210	3	Facility Room 3019c	1	1	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	3,000	0.07	0.04	0.04	213	105	108
Roosevelt Schools NY	Washington-Rose Elementary School	211	3	Facility Room 3019a	1	1	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	3,000	0.07	0.04	0.04	213	105	108

Roosevelt UFSD, NY
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ECM 1 - LED Lighting and Lighting Controls Upgrade
Lighting Line by Line

Site Name	Building Name	Index	Floor	Location	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Roosevelt Schools NY	Washington-Rose Elementary School	212	3	Office 3020	4	4	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	1,152	0.28	0.14	0.14	327	161	166
Roosevelt Schools NY	Washington-Rose Elementary School	213	3	Classroom 3022	10	10	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	1,152	0.31	0.22	0.09	357	253	104
Roosevelt Schools NY	Washington-Rose Elementary School	214	3	Classroom 3025	1	1	0.0200	0.0200	LED Fixture, 20W	will Not be Retrofit	1,152	0.02	0.02	-	23	23	-
Roosevelt Schools NY	Washington-Rose Elementary School	215	3	Classroom 3025	3	3	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.09	0.07	0.03	107	76	31
Roosevelt Schools NY	Washington-Rose Elementary School	216	3	Classroom 3025	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	2,400	0.06	0.03	0.04	152	67	84
Roosevelt Schools NY	Washington-Rose Elementary School	217	3	Classroom 3026	1	1	0.0200	0.0200	LED Fixture, 20W	will Not be Retrofit	1,152	0.02	0.02	-	23	23	-
Roosevelt Schools NY	Washington-Rose Elementary School	218	3	Classroom 3026	10	10	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	1,152	0.31	0.22	0.09	357	253	104
Roosevelt Schools NY	Washington-Rose Elementary School	219	3	Classroom 3026	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	73	32	41
Roosevelt Schools NY	Washington-Rose Elementary School	220	3	Classroom 3025	3	3	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.09	0.07	0.03	107	76	31
Roosevelt Schools NY	Washington-Rose Elementary School	221	3	Classroom 3027	1	1	0.0200	0.0200	LED Fixture, 20W	will Not be Retrofit	1,152	0.02	0.02	-	23	23	-
Roosevelt Schools NY	Washington-Rose Elementary School	222	3	Classroom 3027	3	3	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.09	0.07	0.03	107	76	31
Roosevelt Schools NY	Washington-Rose Elementary School	223	3	Classroom 3027	10	10	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	1,152	0.31	0.22	0.09	357	253	104
Roosevelt Schools NY	Washington-Rose Elementary School	224	3	Classroom 3027	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	73	32	41
Roosevelt Schools NY	Washington-Rose Elementary School	225	3	Classroom 3028	1	1	0.0200	0.0200	LED Fixture, 20W	will Not be Retrofit	1,152	0.02	0.02	-	23	23	-
Roosevelt Schools NY	Washington-Rose Elementary School	226	3	Classroom 3028	3	3	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.09	0.07	0.03	107	76	31
Roosevelt Schools NY	Washington-Rose Elementary School	227	3	Classroom 3028	10	10	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	1,152	0.31	0.22	0.09	357	253	104
Roosevelt Schools NY	Washington-Rose Elementary School	228	3	Classroom 3028	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	73	32	41
Roosevelt Schools NY	Washington-Rose Elementary School	229	3	Classroom 3029	1	1	0.0200	0.0200	LED Fixture, 20W	will Not be Retrofit	1,152	0.02	0.02	-	23	23	-
Roosevelt Schools NY	Washington-Rose Elementary School	230	3	Classroom 3029	2	2	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.06	0.04	0.02	71	51	21
Roosevelt Schools NY	Washington-Rose Elementary School	231	3	Classroom 3029	10	10	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	1,152	0.31	0.22	0.09	357	253	104
Roosevelt Schools NY	Washington-Rose Elementary School	232	3	Classroom 3029	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	73	32	41
Roosevelt Schools NY	Washington-Rose Elementary School	233	3	Utility 3030	2	2	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	750	0.11	0.04	0.06	80	33	47
Roosevelt Schools NY	Washington-Rose Elementary School	234	3	Classroom 3032	10	10	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	1,152	0.31	0.22	0.09	357	253	104
Roosevelt Schools NY	Washington-Rose Elementary School	235	3	Classroom 3032	4	4	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	1,600	0.28	0.14	0.14	454	224	230
Roosevelt Schools NY	Washington-Rose Elementary School	236	3	Classroom 3023	8	8	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	1,152	0.25	0.18	0.07	286	203	83
Roosevelt Schools NY	Washington-Rose Elementary School	237	3	Classroom 3002	1	1	0.0200	0.0200	LED Fixture, 20W	will Not be Retrofit	1,152	0.02	0.02	-	23	23	-
Roosevelt Schools NY	Washington-Rose Elementary School	238	3	Classroom 3002	2	2	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.06	0.04	0.02	71	51	21
Roosevelt Schools NY	Washington-Rose Elementary School	239	3	Classroom 3002	10	10	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	1,152	0.31	0.22	0.09	357	253	104
Roosevelt Schools NY	Washington-Rose Elementary School	240	3	Classroom 3002	2	2	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.13	0.06	0.07	146	65	81
Roosevelt Schools NY	Washington-Rose Elementary School	241	3	Classroom 3003	1	1	0.0200	0.0200	LED Fixture, 20W	will Not be Retrofit	1,152	0.02	0.02	-	23	23	-
Roosevelt Schools NY	Washington-Rose Elementary School	242	3	Classroom 3003	3	3	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.09	0.07	0.03	107	76	31
Roosevelt Schools NY	Washington-Rose Elementary School	243	3	Classroom 3003	10	10	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	1,152	0.31	0.22	0.09	357	253	104
Roosevelt Schools NY	Washington-Rose Elementary School	244	3	Classroom 3003	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	73	32	41
Roosevelt Schools NY	Washington-Rose Elementary School	245	3	Classroom 3004	1	1	0.0200	0.0200	LED Fixture, 20W	will Not be Retrofit	1,152	0.02	0.02	-	23	23	-

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Site Name	Building Name	Index	Floor	Location	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Roosevelt Schools NY	Washington-Rose Elementary School	246	3	Classroom 3004	2	2	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.06	0.04	0.02	71	51	21
Roosevelt Schools NY	Washington-Rose Elementary School	247	3	Classroom 3004	10	10	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	1,152	0.31	0.22	0.09	357	253	104
Roosevelt Schools NY	Washington-Rose Elementary School	248	3	Classroom 3004	2	2	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.13	0.06	0.07	146	65	81
Roosevelt Schools NY	Washington-Rose Elementary School	249	3	Classroom 3005	1	1	0.0200	0.0200	LED Fixture, 20W	will Not be Retrofit	1,152	0.02	0.02	-	23	23	-
Roosevelt Schools NY	Washington-Rose Elementary School	250	3	Classroom 3005	3	3	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.09	0.07	0.03	107	76	31
Roosevelt Schools NY	Washington-Rose Elementary School	251	3	Classroom 3005	10	10	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	1,152	0.31	0.22	0.09	357	253	104
Roosevelt Schools NY	Washington-Rose Elementary School	252	3	Classroom 3005	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	73	32	41
Roosevelt Schools NY	Washington-Rose Elementary School	253	3	Classroom 3006	1	1	0.0200	0.0200	LED Fixture, 20W	will Not be Retrofit	1,152	0.02	0.02	-	23	23	-
Roosevelt Schools NY	Washington-Rose Elementary School	254	3	Classroom 3006	3	3	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.09	0.07	0.03	107	76	31
Roosevelt Schools NY	Washington-Rose Elementary School	255	3	Classroom 3006	10	10	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	1,152	0.31	0.22	0.09	357	253	104
Roosevelt Schools NY	Washington-Rose Elementary School	256	3	Classroom 3006	2	2	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.13	0.06	0.07	146	65	81
Roosevelt Schools NY	Washington-Rose Elementary School	257	3	Hallway H1	5	5	0.0350	0.0350	LED Fixture, 35W	will Not be Retrofit	2,400	0.18	0.18	-	420	420	-
Roosevelt Schools NY	Washington-Rose Elementary School	258	3	Hallway H1	3	3	0.0350	0.0350	LED Fixture, 35W	will Not be Retrofit	8,753	0.11	0.11	-	919	919	-
Roosevelt Schools NY	Washington-Rose Elementary School	259	3	Hallway H1	10	10	0.0560	0.0170	CF PL (2) 26w	LED Retrofit Can Kit, 8 Inch, HLO	2,400	0.56	0.17	0.39	1,344	408	936
Roosevelt Schools NY	Washington-Rose Elementary School	260	3	Hallway H1	2	2	-	-	No Retrofit	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Washington-Rose Elementary School	261	3	Hallway H2	22	22	0.0350	0.0350	LED Fixture, 35W	will Not be Retrofit	2,400	0.77	0.77	-	1,848	1,848	-
Roosevelt Schools NY	Washington-Rose Elementary School	262	3	Hallway H2	8	8	0.0350	0.0350	LED Fixture, 35W	will Not be Retrofit	8,753	0.28	0.28	-	2,451	2,451	-
Roosevelt Schools NY	Washington-Rose Elementary School	263	3	Hallway H2	10	10	0.0560	0.0170	CF PL (2) 26w	LED Retrofit Can Kit, 8 Inch, HLO	2,400	0.56	0.17	0.39	1,344	408	936
Roosevelt Schools NY	Washington-Rose Elementary School	264	3	Hallway H2	2	2	-	-	No Retrofit	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Washington-Rose Elementary School	265	3	Hallway H3	4	4	0.0350	0.0350	LED Fixture, 35W	will Not be Retrofit	2,400	0.14	0.14	-	336	336	-
Roosevelt Schools NY	Washington-Rose Elementary School	266	3	Hallway H3	3	3	0.0350	0.0350	LED Fixture, 35W	will Not be Retrofit	8,753	0.11	0.11	-	919	919	-
Roosevelt Schools NY	Washington-Rose Elementary School	267	3	Hallway H3	6	6	0.0560	0.0170	CF PL (2) 26w	LED Retrofit Can Kit, 8 Inch, HLO	2,400	0.34	0.10	0.23	806	245	562
Roosevelt Schools NY	Washington-Rose Elementary School	268	3	Hallway H3	2	2	-	-	No Retrofit	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Washington-Rose Elementary School	269	2	Classroom 2007	1	1	0.0200	0.0200	LED Fixture, 20W	will Not be Retrofit	1,152	0.02	0.02	-	23	23	-
Roosevelt Schools NY	Washington-Rose Elementary School	270	2	Classroom 2007	10	10	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	1,152	0.31	0.22	0.09	357	253	104
Roosevelt Schools NY	Washington-Rose Elementary School	271	2	Classroom 2007	2	2	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	1,152	0.06	0.04	0.02	71	51	21
Roosevelt Schools NY	Washington-Rose Elementary School	272	2	Classroom 2007	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	73	32	41
Roosevelt Schools NY	Washington-Rose Elementary School	273	2	Classroom 2007b Bathroom	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	2,400	0.06	0.03	0.04	152	67	84
Roosevelt Schools NY	Washington-Rose Elementary School	274	2	Office 2009	6	6	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	1,152	0.43	0.21	0.22	491	242	249
Roosevelt Schools NY	Washington-Rose Elementary School	275	2	Classroom 2010	10	10	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	1,152	0.31	0.22	0.09	357	253	104
Roosevelt Schools NY	Washington-Rose Elementary School	276	2	Classroom 2010	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	73	32	41
Roosevelt Schools NY	Washington-Rose Elementary School	277	2	Classroom 2011	15	15	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	1,152	0.47	0.33	0.14	536	380	156
Roosevelt Schools NY	Washington-Rose Elementary School	278	2	Classroom 2011	2	2	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.13	0.06	0.07	146	65	81
Roosevelt Schools NY	Washington-Rose Elementary School	279	2	Bathroom, Men's BR2	9	9	0.0560	0.0130	CF PL (2) 26w	LED Retrofit Can Kit, 6 Inch, NLO	2,400	0.50	0.12	0.39	1,210	281	929

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Site Name	Building Name	Index	Floor	Location	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Roosevelt Schools NY	Washington-Rose Elementary School	280	2	Bathroom, Men's BR2	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,400	0.05	0.02	0.03	128	53	75
Roosevelt Schools NY	Washington-Rose Elementary School	281	2	Utility 2013	2	2	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	750	0.11	0.04	0.06	80	33	47
Roosevelt Schools NY	Washington-Rose Elementary School	282	2	Bathroom, Men's GR2	9	9	0.0560	0.0130	CF PL (2) 26w	LED Retrofit Can Kit, 6 Inch, NLO	2,400	0.50	0.12	0.39	1,210	281	929
Roosevelt Schools NY	Washington-Rose Elementary School	283	2	Bathroom, Men's GR2	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,400	0.05	0.02	0.03	128	53	75
Roosevelt Schools NY	Washington-Rose Elementary School	284	2	Classroom 2016	10	10	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	1,152	0.31	0.22	0.09	357	253	104
Roosevelt Schools NY	Washington-Rose Elementary School	285	2	Classroom 2016	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	73	32	41
Roosevelt Schools NY	Washington-Rose Elementary School	286	2	Classroom 2016b Bathroom	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	2,400	0.06	0.03	0.04	152	67	84
Roosevelt Schools NY	Washington-Rose Elementary School	287	2	Office 2017	4	4	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	1,152	0.28	0.14	0.14	327	161	166
Roosevelt Schools NY	Washington-Rose Elementary School	288	2	Classroom 2020	1	1	0.0200	0.0200	LED Fixture, 20W	will Not be Retrofit	1,152	0.02	0.02	-	23	23	-
Roosevelt Schools NY	Washington-Rose Elementary School	289	2	Classroom 2020	3	3	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.09	0.07	0.03	107	76	31
Roosevelt Schools NY	Washington-Rose Elementary School	290	2	Classroom 2020	10	10	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	1,152	0.31	0.22	0.09	357	253	104
Roosevelt Schools NY	Washington-Rose Elementary School	291	2	Classroom 2020	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	73	32	41
Roosevelt Schools NY	Washington-Rose Elementary School	292	2	Classroom 2021	1	1	0.0200	0.0200	LED Fixture, 20W	will Not be Retrofit	1,152	0.02	0.02	-	23	23	-
Roosevelt Schools NY	Washington-Rose Elementary School	293	2	Classroom 2021	3	3	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.09	0.07	0.03	107	76	31
Roosevelt Schools NY	Washington-Rose Elementary School	294	2	Classroom 2021	10	10	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	1,152	0.31	0.22	0.09	357	253	104
Roosevelt Schools NY	Washington-Rose Elementary School	295	2	Classroom 2021	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	73	32	41
Roosevelt Schools NY	Washington-Rose Elementary School	296	2	Classroom 2022	1	1	0.0200	0.0200	LED Fixture, 20W	will Not be Retrofit	1,152	0.02	0.02	-	23	23	-
Roosevelt Schools NY	Washington-Rose Elementary School	297	2	Classroom 2022	3	3	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.09	0.07	0.03	107	76	31
Roosevelt Schools NY	Washington-Rose Elementary School	298	2	Classroom 2022	10	10	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	1,152	0.31	0.22	0.09	357	253	104
Roosevelt Schools NY	Washington-Rose Elementary School	299	2	Classroom 2022	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	73	32	41
Roosevelt Schools NY	Washington-Rose Elementary School	300	2	Classroom 2023	1	1	0.0200	0.0200	LED Fixture, 20W	will Not be Retrofit	1,152	0.02	0.02	-	23	23	-
Roosevelt Schools NY	Washington-Rose Elementary School	301	2	Classroom 2023	3	3	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.09	0.07	0.03	107	76	31
Roosevelt Schools NY	Washington-Rose Elementary School	302	2	Classroom 2023	10	10	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	1,152	0.31	0.22	0.09	357	253	104
Roosevelt Schools NY	Washington-Rose Elementary School	303	2	Classroom 2023	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	73	32	41
Roosevelt Schools NY	Washington-Rose Elementary School	304	2	Library 2024	72	72	0.0620	0.0440	LED Fixture, 1444 BR, DS	LED Int. Driver Lamps, (4) 4' Lamps, DS, HI, XLL	1,840	4.46	3.17	1.30	8,214	5,829	2,385
Roosevelt Schools NY	Washington-Rose Elementary School	305	2	Library 2024	13	13	0.2350	0.1000	1x8, 4-Lamp T5H 4'	LED Int. Driver Lamp, (4) 4' T5 HO Lamps, HI	1,840	3.06	1.30	1.76	5,621	2,392	3,229
Roosevelt Schools NY	Washington-Rose Elementary School	306	2	Library 2024	2	2	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps, HI	1,728	0.13	0.06	0.07	218	97	122
Roosevelt Schools NY	Washington-Rose Elementary School	307	2	Library 2024	8	8	0.0500	0.0060	Inc 50w	LED Lamp, MR16, NLO, E26	1,840	0.40	0.05	0.35	736	88	648
Roosevelt Schools NY	Washington-Rose Elementary School	308	2	Library 2024	4	4	0.0200	0.0200	LED Fixture, 20W	will Not be Retrofit	1,840	0.08	0.08	-	147	147	-
Roosevelt Schools NY	Washington-Rose Elementary School	309	2	Library 2024 Bathroom	2	2	0.0543	0.0210	2x2, 2-Lamp U T8	LED Int. Driver Lamps, (3) 2' Lamps, 2x2 Kit	2,400	0.11	0.04	0.07	261	101	160
Roosevelt Schools NY	Washington-Rose Elementary School	310	2	Library 2024a	2	2	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.11	0.04	0.06	123	51	72
Roosevelt Schools NY	Washington-Rose Elementary School	311	2	Library 2024c	2	2	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.11	0.04	0.06	123	51	72
Roosevelt Schools NY	Washington-Rose Elementary School	312	2	Utility 2027	2	2	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	750	0.11	0.04	0.06	80	33	47
Roosevelt Schools NY	Washington-Rose Elementary School	313	2	Utility 2028 Electrical	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	750	0.05	0.02	0.03	40	17	24

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Site Name	Building Name	Index	Floor	Location	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Roosevelt Schools NY	Washington-Rose Elementary School	314	2	Classroom 2029	1	1	0.0200	0.0200	LED Fixture, 20W	will Not be Retrofit	1,152	0.02	0.02	-	23	23	-
Roosevelt Schools NY	Washington-Rose Elementary School	315	2	Classroom 2029	2	2	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.06	0.04	0.02	71	51	21
Roosevelt Schools NY	Washington-Rose Elementary School	316	2	Classroom 2029	10	10	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	1,152	0.31	0.22	0.09	357	253	104
Roosevelt Schools NY	Washington-Rose Elementary School	317	2	Classroom 2029	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	73	32	41
Roosevelt Schools NY	Washington-Rose Elementary School	318	2	Storage 2030	2	2	0.0543	0.0210	2x2, 2-Lamp U T8	LED Int. Driver Lamps, (3) 2' Lamps, 2x2 Kit	750	0.11	0.04	0.07	81	32	50
Roosevelt Schools NY	Washington-Rose Elementary School	319	2	Classroom 2032	10	10	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	1,152	0.31	0.22	0.09	357	253	104
Roosevelt Schools NY	Washington-Rose Elementary School	320	2	Classroom 2032	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	73	32	41
Roosevelt Schools NY	Washington-Rose Elementary School	321	3	Storage 2031	6	6	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	1,440	0.43	0.21	0.22	613	302	311
Roosevelt Schools NY	Washington-Rose Elementary School	322	2	Classroom 2002	1	1	0.0200	0.0200	LED Fixture, 20W	will Not be Retrofit	1,152	0.02	0.02	-	23	23	-
Roosevelt Schools NY	Washington-Rose Elementary School	323	2	Classroom 2002	2	2	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.06	0.04	0.02	71	51	21
Roosevelt Schools NY	Washington-Rose Elementary School	324	2	Classroom 2002	10	10	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	1,152	0.31	0.22	0.09	357	253	104
Roosevelt Schools NY	Washington-Rose Elementary School	325	2	Classroom 2002	2	2	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.13	0.06	0.07	146	65	81
Roosevelt Schools NY	Washington-Rose Elementary School	326	2	Classroom 2003	1	1	0.0200	0.0200	LED Fixture, 20W	will Not be Retrofit	1,152	0.02	0.02	-	23	23	-
Roosevelt Schools NY	Washington-Rose Elementary School	327	2	Classroom 2003	3	3	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.09	0.07	0.03	107	76	31
Roosevelt Schools NY	Washington-Rose Elementary School	328	2	Classroom 2003	10	10	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	1,152	0.31	0.22	0.09	357	253	104
Roosevelt Schools NY	Washington-Rose Elementary School	329	2	Classroom 2003	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	73	32	41
Roosevelt Schools NY	Washington-Rose Elementary School	330	2	Classroom 2004	1	1	0.0200	0.0200	LED Fixture, 20W	will Not be Retrofit	1,152	0.02	0.02	-	23	23	-
Roosevelt Schools NY	Washington-Rose Elementary School	331	2	Classroom 2004	2	2	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.06	0.04	0.02	71	51	21
Roosevelt Schools NY	Washington-Rose Elementary School	332	2	Classroom 2004	10	10	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	1,152	0.31	0.22	0.09	357	253	104
Roosevelt Schools NY	Washington-Rose Elementary School	333	2	Classroom 2004	2	2	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.13	0.06	0.07	146	65	81
Roosevelt Schools NY	Washington-Rose Elementary School	334	2	Classroom 2005	1	1	0.0200	0.0200	LED Fixture, 20W	will Not be Retrofit	1,152	0.02	0.02	-	23	23	-
Roosevelt Schools NY	Washington-Rose Elementary School	335	2	Classroom 2005	3	3	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.09	0.07	0.03	107	76	31
Roosevelt Schools NY	Washington-Rose Elementary School	336	2	Classroom 2005	10	10	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	1,152	0.31	0.22	0.09	357	253	104
Roosevelt Schools NY	Washington-Rose Elementary School	337	2	Classroom 2005	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	73	32	41
Roosevelt Schools NY	Washington-Rose Elementary School	338	2	Classroom 2006	1	1	0.0200	0.0200	LED Fixture, 20W	will Not be Retrofit	1,152	0.02	0.02	-	23	23	-
Roosevelt Schools NY	Washington-Rose Elementary School	339	2	Classroom 2006	2	2	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.06	0.04	0.02	71	51	21
Roosevelt Schools NY	Washington-Rose Elementary School	340	2	Classroom 2006	10	10	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	1,152	0.31	0.22	0.09	357	253	104
Roosevelt Schools NY	Washington-Rose Elementary School	341	2	Classroom 2006	2	2	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.13	0.06	0.07	146	65	81
Roosevelt Schools NY	Washington-Rose Elementary School	342	2	Hallway H4	5	5	0.0350	0.0350	LED Fixture, 35W	will Not be Retrofit	2,400	0.18	0.18	-	420	420	-
Roosevelt Schools NY	Washington-Rose Elementary School	343	2	Hallway H4	3	3	0.0350	0.0350	LED Fixture, 35W	will Not be Retrofit	8,760	0.11	0.11	-	920	920	-
Roosevelt Schools NY	Washington-Rose Elementary School	344	2	Hallway H4	18	18	0.0560	0.0130	CF PL (2) 26w	LED Retrofit Can Kit, 6 Inch, NLO	2,400	1.01	0.23	0.77	2,419	562	1,858
Roosevelt Schools NY	Washington-Rose Elementary School	345	2	Hallway H4	2	2	-	-	No Retrofit	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Washington-Rose Elementary School	346	2	Hallway H5	26	26	0.0350	0.0350	LED Fixture, 35W	will Not be Retrofit	2,400	0.91	0.91	-	2,184	2,184	-
Roosevelt Schools NY	Washington-Rose Elementary School	347	2	Hallway H5	6	6	0.0350	0.0350	LED Fixture, 35W	will Not be Retrofit	8,760	0.21	0.21	-	1,840	1,840	-

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Site Name	Building Name	Index	Floor	Location	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Roosevelt Schools NY	Washington-Rose Elementary School	348	2	Hallway H5	1	1	-	-	No Retrofit	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Washington-Rose Elementary School	349	2	Hallway H6	3	3	0.0350	0.0350	LED Fixture, 35W	will Not be Retrofit	2,400	0.11	0.11	-	252	252	-
Roosevelt Schools NY	Washington-Rose Elementary School	350	2	Hallway H6	3	3	0.0350	0.0350	LED Fixture, 35W	will Not be Retrofit	8,760	0.11	0.11	-	920	920	-
Roosevelt Schools NY	Washington-Rose Elementary School	351	2	Hallway H6	7	7	0.0560	0.0130	CF PL (2) 26w	LED Retrofit Can Kit, 6 Inch, NLO	2,400	0.39	0.09	0.30	941	218	722
Roosevelt Schools NY	Washington-Rose Elementary School	352	2	Hallway H6	3	3	-	-	No Retrofit	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Washington-Rose Elementary School	353	2	Hallway H6	2	2	0.0560	0.0130	CF PL (2) 26w	LED Retrofit Can Kit, 6 Inch, NLO	2,400	0.11	0.03	0.09	269	62	206
Roosevelt Schools NY	Washington-Rose Elementary School	354	1	Classroom 1012	1	1	0.0200	0.0200	LED Fixture, 20W	will Not be Retrofit	1,152	0.02	0.02	-	23	23	-
Roosevelt Schools NY	Washington-Rose Elementary School	355	1	Classroom 1012	2	2	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.06	0.04	0.02	71	51	21
Roosevelt Schools NY	Washington-Rose Elementary School	356	1	Classroom 1012	10	10	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	1,152	0.31	0.22	0.09	357	253	104
Roosevelt Schools NY	Washington-Rose Elementary School	357	1	Classroom 1012b	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	2,079	0.06	0.03	0.04	131	58	73
Roosevelt Schools NY	Washington-Rose Elementary School	358	1	Classroom 1013	1	1	0.0200	0.0200	LED Fixture, 20W	will Not be Retrofit	1,152	0.02	0.02	-	23	23	-
Roosevelt Schools NY	Washington-Rose Elementary School	359	1	Classroom 1013	3	3	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.09	0.07	0.03	107	76	31
Roosevelt Schools NY	Washington-Rose Elementary School	360	1	Classroom 1013	10	10	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	1,152	0.31	0.22	0.09	357	253	104
Roosevelt Schools NY	Washington-Rose Elementary School	361	1	Classroom 1013	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	73	32	41
Roosevelt Schools NY	Washington-Rose Elementary School	362	1	Classroom 1013b	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	2,079	0.06	0.03	0.04	131	58	73
Roosevelt Schools NY	Washington-Rose Elementary School	363	1	Classroom 1015	1	1	0.0200	0.0200	LED Fixture, 20W	will Not be Retrofit	1,152	0.02	0.02	-	23	23	-
Roosevelt Schools NY	Washington-Rose Elementary School	364	1	Classroom 1015	2	2	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.06	0.04	0.02	71	51	21
Roosevelt Schools NY	Washington-Rose Elementary School	365	1	Classroom 1015	2	2	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.13	0.06	0.07	146	65	81
Roosevelt Schools NY	Washington-Rose Elementary School	366	1	Classroom 1015	10	10	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	1,152	0.31	0.22	0.09	357	253	104
Roosevelt Schools NY	Washington-Rose Elementary School	367	1	Classroom 1015	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	2,079	0.06	0.03	0.04	131	58	73
Roosevelt Schools NY	Washington-Rose Elementary School	368	1	Classroom 1016	10	10	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	2,079	0.31	0.22	0.09	644	457	187
Roosevelt Schools NY	Washington-Rose Elementary School	369	1	Classroom 1016	1	1	0.0200	0.0200	LED Fixture, 20W	will Not be Retrofit	1,152	0.02	0.02	-	23	23	-
Roosevelt Schools NY	Washington-Rose Elementary School	370	1	Classroom 1016	3	3	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.09	0.07	0.03	107	76	31
Roosevelt Schools NY	Washington-Rose Elementary School	371	1	Classroom 1016	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	73	32	41
Roosevelt Schools NY	Washington-Rose Elementary School	372	1	Classroom 1016b	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	2,079	0.06	0.03	0.04	131	58	73
Roosevelt Schools NY	Washington-Rose Elementary School	373	1	Classroom 1018	10	10	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	2,079	0.31	0.22	0.09	644	457	187
Roosevelt Schools NY	Washington-Rose Elementary School	374	1	Classroom 1018	1	1	0.0200	0.0200	LED Fixture, 20W	will Not be Retrofit	1,152	0.02	0.02	-	23	23	-
Roosevelt Schools NY	Washington-Rose Elementary School	375	1	Classroom 1018	2	2	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.06	0.04	0.02	71	51	21
Roosevelt Schools NY	Washington-Rose Elementary School	376	1	Classroom 1018b	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	2,079	0.06	0.03	0.04	131	58	73
Roosevelt Schools NY	Washington-Rose Elementary School	377	1	Classroom 1022	10	10	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	2,079	0.31	0.22	0.09	644	457	187
Roosevelt Schools NY	Washington-Rose Elementary School	378	1	Classroom 1022	1	1	0.0200	0.0200	LED Fixture, 20W	will Not be Retrofit	1,152	0.02	0.02	-	23	23	-
Roosevelt Schools NY	Washington-Rose Elementary School	379	1	Classroom 1022	2	2	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.06	0.04	0.02	71	51	21
Roosevelt Schools NY	Washington-Rose Elementary School	380	1	Classroom 1022	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	73	32	41
Roosevelt Schools NY	Washington-Rose Elementary School	381	1	Classroom 1022b	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	2,079	0.06	0.03	0.04	131	58	73

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Lighting Line by Line

Site Name	Building Name	Index	Floor	Location	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Roosevelt Schools NY	Washington-Rose Elementary School	382	1	Classroom 1023	10	10	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	2,079	0.31	0.22	0.09	644	457	187
Roosevelt Schools NY	Washington-Rose Elementary School	383	1	Classroom 1023	1	1	0.0200	0.0200	LED Fixture, 20W	will Not be Retrofit	1,152	0.02	0.02	-	23	23	-
Roosevelt Schools NY	Washington-Rose Elementary School	384	1	Classroom 1023	3	3	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.09	0.07	0.03	107	76	31
Roosevelt Schools NY	Washington-Rose Elementary School	385	1	Classroom 1023	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	73	32	41
Roosevelt Schools NY	Washington-Rose Elementary School	386	1	Classroom 1023b	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	2,400	0.06	0.03	0.04	152	67	84
Roosevelt Schools NY	Washington-Rose Elementary School	387	1	Classroom 1025	10	10	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	2,079	0.31	0.22	0.09	644	457	187
Roosevelt Schools NY	Washington-Rose Elementary School	388	1	Classroom 1025	1	1	0.0200	0.0200	LED Fixture, 20W	will Not be Retrofit	1,152	0.02	0.02	-	23	23	-
Roosevelt Schools NY	Washington-Rose Elementary School	389	1	Classroom 1025	2	2	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.06	0.04	0.02	71	51	21
Roosevelt Schools NY	Washington-Rose Elementary School	390	1	Classroom 1025	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	73	32	41
Roosevelt Schools NY	Washington-Rose Elementary School	391	1	Classroom 1026	10	10	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	2,079	0.31	0.22	0.09	644	457	187
Roosevelt Schools NY	Washington-Rose Elementary School	392	1	Classroom 1026	1	1	0.0200	0.0200	LED Fixture, 20W	will Not be Retrofit	1,152	0.02	0.02	-	23	23	-
Roosevelt Schools NY	Washington-Rose Elementary School	393	1	Classroom 1026	2	2	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.06	0.04	0.02	71	51	21
Roosevelt Schools NY	Washington-Rose Elementary School	394	1	Classroom 1026	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	73	32	41
Roosevelt Schools NY	Washington-Rose Elementary School	395	1	Classroom 1026b	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	73	32	41
Roosevelt Schools NY	Washington-Rose Elementary School	396	1	Office 1029	6	6	0.0280	0.0130	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	1,152	0.17	0.08	0.09	194	90	104
Roosevelt Schools NY	Washington-Rose Elementary School	397	1	Office 1029	2	2	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	1,152	0.06	0.04	0.02	71	51	21
Roosevelt Schools NY	Washington-Rose Elementary School	398	1	Classroom 1028	14	14	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	1,152	0.43	0.31	0.13	500	355	145
Roosevelt Schools NY	Washington-Rose Elementary School	399	1	Classroom 1028	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	73	32	41
Roosevelt Schools NY	Washington-Rose Elementary School	400	1	Classroom 1028b	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	73	32	41
Roosevelt Schools NY	Washington-Rose Elementary School	401	1	Utility El3	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	750	0.05	0.02	0.03	40	17	24
Roosevelt Schools NY	Washington-Rose Elementary School	402	1	Facility Bathoom	1	1	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	2,400	0.07	0.04	0.04	170	84	86
Roosevelt Schools NY	Washington-Rose Elementary School	403	1	Facility Bathoom	1	1	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	2,400	0.07	0.04	0.04	170	84	86
Roosevelt Schools NY	Washington-Rose Elementary School	404	1	Security Office	2	2	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	1,152	0.14	0.07	0.07	164	81	83
Roosevelt Schools NY	Washington-Rose Elementary School	405	1	Conference Room	2	2	0.0310	0.0240	LED Fixture, 1424 BR, EM	LED Type C Lamps, (2) 4' Lamp, LED Driver, DIM	2,200	0.06	0.05	0.01	136	106	31
Roosevelt Schools NY	Washington-Rose Elementary School	406	1	Conference Room	6	6	0.0560	0.0130	CF PL (2) 26w	LED Retrofit Can Kit, 6 Inch, NLO	1,760	0.34	0.08	0.26	591	137	454
Roosevelt Schools NY	Washington-Rose Elementary School	407	1	Office 1049	11	11	0.0280	0.0130	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	1,152	0.31	0.14	0.17	355	165	190
Roosevelt Schools NY	Washington-Rose Elementary School	408	1	Office 1049	2	2	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.11	0.04	0.06	123	51	72
Roosevelt Schools NY	Washington-Rose Elementary School	409	1	Office 1049	4	4	0.0280	0.0130	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	1,152	0.11	0.05	0.06	129	60	69
Roosevelt Schools NY	Washington-Rose Elementary School	410	1	Office 1049	1	1	-	-	No Retrofit	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Washington-Rose Elementary School	411	1	Storage 1050	2	2	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	600	0.11	0.04	0.06	64	26	38
Roosevelt Schools NY	Washington-Rose Elementary School	412	1	Cpy Room	4	4	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	1,152	0.28	0.14	0.14	327	161	166
Roosevelt Schools NY	Washington-Rose Elementary School	413	1	Principal Bathroom	1	1	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	2,400	0.07	0.04	0.04	170	84	86
Roosevelt Schools NY	Washington-Rose Elementary School	414	1	Nurse Office 1034	9	9	0.0280	0.0130	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	1,152	0.25	0.12	0.14	290	135	156
Roosevelt Schools NY	Washington-Rose Elementary School	415	1	Nurse Office 1034	2	2	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	1,152	0.14	0.07	0.07	164	81	83

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Site Name	Building Name	Index	Floor	Location	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Roosevelt Schools NY	Washington-Rose Elementary School	416	1	Nurse Office 1034	3	3	0.0600	0.0290	1x4, 2-Lamp T5E	LED Int. Driver Lamp, (2) 4' T5 HE Lamps	1,152	0.18	0.09	0.09	207	100	107
Roosevelt Schools NY	Washington-Rose Elementary School	417	1	Nurse Office 1034	2	2	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	1,152	0.14	0.07	0.07	164	81	83
Roosevelt Schools NY	Washington-Rose Elementary School	418	1	Nurse Office 1034	1	1	-	-	No Retrofit	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Washington-Rose Elementary School	419	1	Exam Room	2	2	0.0465	0.0330	LED Fixture, 2434 BR	LED Int. Driver Lamps, (3) 4' Lamps	1,440	0.09	0.07	0.03	134	95	39
Roosevelt Schools NY	Washington-Rose Elementary School	420	1	Record Room	2	2	0.0465	0.0330	LED Fixture, 2434 BR	LED Int. Driver Lamps, (3) 4' Lamps	1,440	0.09	0.07	0.03	134	95	39
Roosevelt Schools NY	Washington-Rose Elementary School	421	1	Utility Room	2	2	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps	750	0.06	0.04	0.02	47	33	14
Roosevelt Schools NY	Washington-Rose Elementary School	422	1	Nurse Office 1033	4	4	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	1,152	0.28	0.14	0.14	327	161	166
Roosevelt Schools NY	Washington-Rose Elementary School	423	1	Office 1043	4	4	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	1,760	0.28	0.14	0.14	500	246	253
Roosevelt Schools NY	Washington-Rose Elementary School	424	1	Office 1045	4	4	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	1,760	0.28	0.14	0.14	500	246	253
Roosevelt Schools NY	Washington-Rose Elementary School	425	1	Office 1042	4	4	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	1,760	0.28	0.14	0.14	500	246	253
Roosevelt Schools NY	Washington-Rose Elementary School	426	1	Hallway H7	5	5	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	3,000	0.36	0.18	0.18	1,065	525	540
Roosevelt Schools NY	Washington-Rose Elementary School	427	1	Hallway H7	2	2	-	-	No Retrofit	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Washington-Rose Elementary School	428	1	Classroom 1004	10	10	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	2,079	0.31	0.22	0.09	644	457	187
Roosevelt Schools NY	Washington-Rose Elementary School	429	1	Classroom 1004	2	2	0.0280	0.0130	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	1,152	0.06	0.03	0.03	65	30	35
Roosevelt Schools NY	Washington-Rose Elementary School	430	1	Classroom 1004	2	2	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.06	0.04	0.02	71	51	21
Roosevelt Schools NY	Washington-Rose Elementary School	431	1	Classroom 1004b	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	2,079	0.06	0.03	0.04	131	58	73
Roosevelt Schools NY	Washington-Rose Elementary School	432	1	Classroom 1005	10	10	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	2,079	0.31	0.22	0.09	644	457	187
Roosevelt Schools NY	Washington-Rose Elementary School	433	1	Classroom 1005	1	1	0.0200	0.0200	LED Fixture, 20W	will Not be Retrofit	1,152	0.02	0.02	-	23	23	-
Roosevelt Schools NY	Washington-Rose Elementary School	434	1	Classroom 1005	3	3	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.09	0.07	0.03	107	76	31
Roosevelt Schools NY	Washington-Rose Elementary School	435	1	Classroom 1005	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	73	32	41
Roosevelt Schools NY	Washington-Rose Elementary School	436	1	Classroom 1005b	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	2,400	0.06	0.03	0.04	152	67	84
Roosevelt Schools NY	Washington-Rose Elementary School	437	1	Classroom 1007	10	10	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	1,152	0.31	0.22	0.09	357	253	104
Roosevelt Schools NY	Washington-Rose Elementary School	438	1	Classroom 1007	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	73	32	41
Roosevelt Schools NY	Washington-Rose Elementary School	439	1	Classroom 1007	2	2	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.06	0.04	0.02	71	51	21
Roosevelt Schools NY	Washington-Rose Elementary School	440	1	Classroom 1008	10	10	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	2,079	0.31	0.22	0.09	644	457	187
Roosevelt Schools NY	Washington-Rose Elementary School	441	1	Classroom 1008	1	1	0.0200	0.0200	LED Fixture, 20W	will Not be Retrofit	1,152	0.02	0.02	-	23	23	-
Roosevelt Schools NY	Washington-Rose Elementary School	442	1	Classroom 1008	3	3	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.09	0.07	0.03	107	76	31
Roosevelt Schools NY	Washington-Rose Elementary School	443	1	Classroom 1008	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	73	32	41
Roosevelt Schools NY	Washington-Rose Elementary School	444	1	Classroom 1008b	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	2,400	0.06	0.03	0.04	152	67	84
Roosevelt Schools NY	Washington-Rose Elementary School	445	1	Classroom 1010	10	10	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps, XXL	2,079	0.31	0.22	0.09	644	457	187
Roosevelt Schools NY	Washington-Rose Elementary School	446	1	Classroom 1010	1	1	0.0200	0.0200	LED Fixture, 20W	will Not be Retrofit	1,152	0.02	0.02	-	23	23	-
Roosevelt Schools NY	Washington-Rose Elementary School	447	1	Classroom 1010	2	2	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.06	0.04	0.02	71	51	21
Roosevelt Schools NY	Washington-Rose Elementary School	448	1	Classroom 1010	1	1	0.0632	0.0280	2x2, 4-Lamp T8	LED Int. Driver Lamps, (4) 2' Lamps	1,152	0.06	0.03	0.04	73	32	41
Roosevelt Schools NY	Washington-Rose Elementary School	449	1	Hallway H8	3	3	0.0350	0.0350	LED Fixture, 35W	will Not be Retrofit	2,400	0.11	0.11	-	252	252	-

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Site Name	Building Name	Index	Floor	Location	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Roosevelt Schools NY	Washington-Rose Elementary School	450	1	Hallway H8	3	3	0.0350	0.0350	LED Fixture, 35W	will Not be Retrofit	8,753	0.11	0.11	-	919	919	-
Roosevelt Schools NY	Washington-Rose Elementary School	451	1	Hallway H8	8	8	0.0560	0.0170	CF PL (2) 26w	LED Retrofit Can Kit, 8 Inch, HLO	2,400	0.45	0.14	0.31	1,075	326	749
Roosevelt Schools NY	Washington-Rose Elementary School	452	1	Hallway H8	2	2	-	-	No Retrofit	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Washington-Rose Elementary School	453	1	Hallway H9	24	24	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps	2,400	0.74	0.53	0.22	1,786	1,267	518
Roosevelt Schools NY	Washington-Rose Elementary School	454	1	Hallway H9	8	8	0.0310	0.0220	LED Fixture, 1424 BR, EM	LED Int. Driver Lamps, (2) 4' Lamps	8,753	0.25	0.18	0.07	2,171	1,541	630
Roosevelt Schools NY	Washington-Rose Elementary School	455	1	Hallway H9	2	2	0.0560	0.0100	CF PL (2) 26w	LED Retrofit Can Kit, 4 Inch, HLO	2,400	0.11	0.02	0.09	269	48	221
Roosevelt Schools NY	Washington-Rose Elementary School	456	1	Hallway H9	2	2	0.2350	0.1000	1x8, 4-Lamp T5H 4'	LED Int. Driver Lamp, (4) 4' T5 HO Lamps	3,000	0.47	0.20	0.27	1,410	600	810
Roosevelt Schools NY	Washington-Rose Elementary School	457	1	Hallway H9	8	8	0.2900	0.0800	MH 250w	LED Flood Light ~10,000 Lumens, YK, XL, WH, HI	3,000	2.32	0.64	1.68	6,960	1,920	5,040
Roosevelt Schools NY	Washington-Rose Elementary School	458	1	Hallway H9	3	3	0.0560	0.0170	CF PL (2) 26w	LED Retrofit Can Kit, 8 Inch, HLO, HI	2,400	0.17	0.05	0.12	403	122	281
Roosevelt Schools NY	Washington-Rose Elementary School	459	1	Hallway H9	2	2	-	-	No Retrofit	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Washington-Rose Elementary School	460	1	Hallway H10	2	2	0.0350	0.0350	LED Fixture, 35W	will Not be Retrofit	2,400	0.07	0.07	-	168	168	-
Roosevelt Schools NY	Washington-Rose Elementary School	461	1	Hallway H10	3	3	0.0350	0.0350	LED Fixture, 35W	will Not be Retrofit	8,753	0.11	0.11	-	919	919	-
Roosevelt Schools NY	Washington-Rose Elementary School	462	1	Hallway H10	5	5	0.0560	0.0170	CF PL (2) 26w	LED Retrofit Can Kit, 8 Inch, HLO	2,400	0.28	0.09	0.20	672	204	468
Roosevelt Schools NY	Washington-Rose Elementary School	463	1	Hallway H10	2	2	-	-	No Retrofit	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Washington-Rose Elementary School	464	1	Cafeteria 1054	34	34	0.0546	0.0220	1x4, 2-Lamp T8, DS	LED Int. Driver Lamps, (2) 4' Lamps, DS	1,840	1.86	0.75	1.11	3,416	1,376	2,039
Roosevelt Schools NY	Washington-Rose Elementary School	465	1	Cafeteria 1054	18	18	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, HI	1,840	0.96	0.40	0.57	1,769	729	1,040
Roosevelt Schools NY	Washington-Rose Elementary School	466	1	Cafeteria 1054	14	14	0.0560	0.0210	CF PL (2) 26w	LED Retrofit Can Kit, 10 Inch, NLO, HI	1,840	0.78	0.29	0.49	1,443	541	902
Roosevelt Schools NY	Washington-Rose Elementary School	467	1	Cafeteria 1054	15	15	0.2350	0.1000	1x8, 4-Lamp T5H 4'	LED Int. Driver Lamp, (4) 4' T5 HO Lamps, HI	1,840	3.53	1.50	2.03	6,486	2,760	3,726
Roosevelt Schools NY	Washington-Rose Elementary School	468	1	Cafeteria 1054	8	8	0.1170	0.0500	1x4, 2-Lamp T5 HO	LED Int. Driver Lamp, (2) 4' T5 HO Lamps, HI	1,840	0.94	0.40	0.54	1,722	736	986
Roosevelt Schools NY	Washington-Rose Elementary School	468.1	1	Cafeteria 1054	1	1	0.3520	0.1500	1x4, 6-Lamp T5 HO	LED Int. Driver Lamp, (6) 4' T5 HO Lamps	1,840	0.35	0.15	0.20	648	276	372
Roosevelt Schools NY	Washington-Rose Elementary School	468.2	1	Cafeteria 1054	2	2	0.0850	0.0290	1x6, 2-Lamp T5H	LED Int. Driver Lamp, (2) 3' T5 HO Lamps	1,840	0.17	0.06	0.11	313	107	206
Roosevelt Schools NY	Washington-Rose Elementary School	469	1	Cafeteria 1054	2	2	-	-	No Retrofit	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Washington-Rose Elementary School	470	1	Facility Dnning 1058	11	11	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	864	0.78	0.39	0.40	675	333	342
Roosevelt Schools NY	Washington-Rose Elementary School	471	1	Storage 1057	2	2	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	750	0.14	0.07	0.07	107	53	54
Roosevelt Schools NY	Washington-Rose Elementary School	472	1	Kitchen 1055	22	22	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	1,200	1.56	0.77	0.79	1,874	924	950
Roosevelt Schools NY	Washington-Rose Elementary School	473	1	Kitchen 1055	1	1	0.0280	0.0120	CF PL 26w	LED Retrofit Can Kit, 8 Inch, NLO	1,200	0.03	0.01	0.02	34	14	19
Roosevelt Schools NY	Washington-Rose Elementary School	474	1	Kitchen 1055 Oven Hood	3	3	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,200	0.16	0.07	0.09	192	79	113
Roosevelt Schools NY	Washington-Rose Elementary School	475	1	Kitchen 1055	2	2	-	-	No Retrofit	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Washington-Rose Elementary School	476	1	Walk-in Cooler 1056	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XL	3,750	0.05	0.02	0.03	200	83	118
Roosevelt Schools NY	Washington-Rose Elementary School	477	1	Storage 1059a	2	2	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	750	0.14	0.07	0.07	107	53	54
Roosevelt Schools NY	Washington-Rose Elementary School	478	1	Office 1063	1	1	0.0534	0.0220	2x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.05	0.02	0.03	62	25	36
Roosevelt Schools NY	Washington-Rose Elementary School	479	1	Jc 1062	1	1	0.0534	0.0220	2x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	750	0.05	0.02	0.03	40	17	24
Roosevelt Schools NY	Washington-Rose Elementary School	480	1	Utility 1061	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	750	0.05	0.02	0.03	40	17	24
Roosevelt Schools NY	Washington-Rose Elementary School	481	1	Storage 1073	2	2	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	750	0.14	0.07	0.07	107	53	54

Roosevelt UFSD, NY
Exhibit D-5-1
ECM 1 - LED Lighting and Lighting Controls Upgrade
Lighting Line by Line

Site Name	Building Name	Index	Floor	Location	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Roosevelt Schools NY	Washington-Rose Elementary School	482	1	Bathroom, Men's BR2	2	2	0.0560	0.0130	CF PL (2) 26w	LED Retrofit Can Kit, 6 Inch, NLO	2,400	0.11	0.03	0.09	269	62	206
Roosevelt Schools NY	Washington-Rose Elementary School	483	1	Bathroom, Men's BR2	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,400	0.05	0.02	0.03	128	53	75
Roosevelt Schools NY	Washington-Rose Elementary School	484	1	Bathroom, Men's BR2	2	2	0.0560	0.0130	CF PL (2) 26w	LED Retrofit Can Kit, 6 Inch, NLO	2,400	0.11	0.03	0.09	269	62	206
Roosevelt Schools NY	Washington-Rose Elementary School	485	1	Office 1074	1	1	0.0534	0.0220	2x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.05	0.02	0.03	62	25	36
Roosevelt Schools NY	Washington-Rose Elementary School	486	1	Office 1076	1	1	0.0534	0.0220	2x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	1,152	0.05	0.02	0.03	62	25	36
Roosevelt Schools NY	Washington-Rose Elementary School	487	1	Girls Changing Room 1075	3	3	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	600	0.21	0.11	0.11	128	63	65
Roosevelt Schools NY	Washington-Rose Elementary School	488	1	Boys Changing Room 1075	3	3	0.0710	0.0350	2x2, 2-Lamp 40 Biax	LED Retrofit Panel Kit, 2x2, NLO	600	0.21	0.11	0.11	128	63	65
Roosevelt Schools NY	Washington-Rose Elementary School	489	1	Utility 1078	2	2	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	750	0.11	0.04	0.06	80	33	47
Roosevelt Schools NY	Washington-Rose Elementary School	490	1	Utility 1078	2	2	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	750	0.11	0.04	0.06	80	33	47
Roosevelt Schools NY	Washington-Rose Elementary School	491	1	Stage 1080	4	4	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4, Jack Chain Mount	750	0.21	0.10	0.11	160	75	85
Roosevelt Schools NY	Washington-Rose Elementary School	492	1	Utility 1081	2	2	0.0534	0.0250	1x4, 2-Lamp T8	LED Standard Wrap, NLO, 1x4, Jack Chain Mount	750	0.11	0.05	0.06	80	38	43
Roosevelt Schools NY	Washington-Rose Elementary School	493	1	Gym	16	16	0.2880	0.0870	CF PL (8) 32w	LED High Bay, 13K Lumens, 2x2, OSF, WG, HCP	2,500	4.61	1.39	3.22	11,520	3,480	8,040
Roosevelt Schools NY	Washington-Rose Elementary School	494	1	Gym	25	25	0.2350	0.1000	1x8, 4-Lamp T5H 4'	LED Int. Driver Lamp, (4) 4' T5 HO Lamps, HI	2,500	5.88	2.50	3.38	14,688	6,250	8,438
Roosevelt Schools NY	Washington-Rose Elementary School	495	1	Gym	7	7	0.1170	0.0500	1x4, 2-Lamp T5 HO	LED Int. Driver Lamp, (2) 4' T5 HO Lamps, HI	2,500	0.82	0.35	0.47	2,048	875	1,173
Roosevelt Schools NY	Washington-Rose Elementary School	496	1	Gym	3	3	-	-	No Retrofit	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Washington-Rose Elementary School	497	1	Bathroom, Women's Gr3	2	2	0.0560	0.0130	CF PL (2) 26w	LED Retrofit Can Kit, 6 Inch, NLO	2,400	0.11	0.03	0.09	269	62	206
Roosevelt Schools NY	Washington-Rose Elementary School	498	1	Bathroom, Women's Gr3	1	1	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	2,400	0.05	0.02	0.03	128	53	75
Roosevelt Schools NY	Washington-Rose Elementary School	499	1	Bathroom, Women's Gr3	2	2	0.0560	0.0130	CF PL (2) 26w	LED Retrofit Can Kit, 6 Inch, NLO	2,400	0.11	0.03	0.09	269	62	206
Roosevelt Schools NY	Washington-Rose Elementary School	500	1	Jc 1082	2	2	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	750	0.11	0.04	0.06	80	33	47
Roosevelt Schools NY	Washington-Rose Elementary School	501	1	Utility 1068	6	6	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	750	0.32	0.13	0.19	240	99	141
Roosevelt Schools NY	Washington-Rose Elementary School	502	1	Bathroom, Women's	8	8	0.0560	0.0130	CF PL (2) 26w	LED Retrofit Can Kit, 6 Inch, NLO	2,400	0.45	0.10	0.34	1,075	250	826
Roosevelt Schools NY	Washington-Rose Elementary School	503	1	Bathroom, Men's	8	8	0.0560	0.0130	CF PL (2) 26w	LED Retrofit Can Kit, 6 Inch, NLO	2,400	0.45	0.10	0.34	1,075	250	826
Roosevelt Schools NY	Washington-Rose Elementary School	504	1	Hallway H11	2	2	0.0350	0.0350	LED Fixture, 35W	will Not be Retrofit	2,400	0.07	0.07	-	168	168	-
Roosevelt Schools NY	Washington-Rose Elementary School	505	1	Hallway H11	3	3	0.0350	0.0350	LED Fixture, 35W	will Not be Retrofit	8,753	0.11	0.11	-	919	919	-
Roosevelt Schools NY	Washington-Rose Elementary School	506	1	Hallway H11	1	1	0.0560	0.0130	CF PL (2) 26w	LED Retrofit Can Kit, 6 Inch, NLO	2,400	0.06	0.01	0.04	134	31	103
Roosevelt Schools NY	Washington-Rose Elementary School	507	1	Hallway H11	2	2	-	-	No Retrofit	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Washington-Rose Elementary School	508	1	Hallway H12	7	7	0.0310	0.0310	LED Fixture, 1424 BR	will Not be Retrofit	2,400	0.22	0.22	-	521	521	-
Roosevelt Schools NY	Washington-Rose Elementary School	509	1	Hallway H12	4	4	0.0310	0.0220	LED Fixture, 1424 BR	LED Int. Driver Lamps, (2) 4' Lamps	2,400	0.12	0.09	0.04	298	211	86
Roosevelt Schools NY	Washington-Rose Elementary School	510	1	Hallway H12	1	1	0.0280	0.0130	CF PL 26w	LED Retrofit Can Kit, 6 Inch, NLO	2,400	0.03	0.01	0.02	67	31	36
Roosevelt Schools NY	Washington-Rose Elementary School	511	1	Hallway H12	10	10	0.0280	0.0220	LED Fixture, 1323 BR	LED Int. Driver Lamps, (2) 3' Lamps	2,400	0.28	0.22	0.06	672	528	144
Roosevelt Schools NY	Washington-Rose Elementary School	512	1	Hallway H11	10	10	0.2350	0.1000	1x8, 4-Lamp T5H 4'	LED Int. Driver Lamp, (4) 4' T5 HO Lamps	3,000	2.35	1.00	1.35	7,050	3,000	4,050
Roosevelt Schools NY	Washington-Rose Elementary School	513	1	Hallway H11	3	3	-	-	No Retrofit	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Washington-Rose Elementary School	514	SW	Stairwells S1	1	1	0.0620	0.0440	LED Fixture, 2444 BR	LED Int. Driver Lamps, (4) 4' Lamps, HI	3,750	0.06	0.04	0.02	233	165	68
Roosevelt Schools NY	Washington-Rose Elementary School	515	SW	Stairwells S1	1	1	0.0620	0.0440	LED Fixture, 2444 BR	LED Int. Driver Lamps, (4) 4' Lamps	3,750	0.06	0.04	0.02	233	165	68

Roosevelt UFSD, NY
Exhibit D-5-1
ECM 1 - LED Lighting and Lighting Controls Upgrade
Lighting Line by Line

Site Name	Building Name	Index	Floor	Location	Existing Qty	Proposed Qty	Existing kW	Proposed kW	Existing Description	Proposed Description	Total Hours	Total Pre kW	Total Post kW	Total Saved kW	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Roosevelt Schools NY	Washington-Rose Elementary School	516	SW	Stairwells S1	3	3	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,750	0.16	0.07	0.09	601	248	353
Roosevelt Schools NY	Washington-Rose Elementary School	517	SW	Stairwells S1	2	2	0.0280	0.0180	CF PL 26w	LED Troffer Flat Panel, 2x2, LLO, MM, XL, SM	3,750	0.06	0.04	0.02	210	135	75
Roosevelt Schools NY	Washington-Rose Elementary School	518	SW	Stairwells S1	1	1	-	-	No Retrofit	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Washington-Rose Elementary School	519	SW	Stairwells S2	1	1	0.0310	0.0220	LED Fixture, 2424 BR	LED Int. Driver Lamps, (2) 4' Lamps, HI	3,750	0.03	0.02	0.01	116	83	34
Roosevelt Schools NY	Washington-Rose Elementary School	520	SW	Stairwells S2	1	1	0.0310	0.0220	LED Fixture, 2424 BR	LED Int. Driver Lamps, (2) 4' Lamps	3,750	0.03	0.02	0.01	116	83	34
Roosevelt Schools NY	Washington-Rose Elementary School	521	SW	Stairwells S2	3	3	0.0534	0.0220	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,750	0.16	0.07	0.09	601	248	353
Roosevelt Schools NY	Washington-Rose Elementary School	522	SW	Stairwells S2	1	1	0.0534	0.0220	2x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3,750	0.05	0.02	0.03	200	83	118
Roosevelt Schools NY	Washington-Rose Elementary School	523	SW	Stairwells S2	2	2	-	-	No Retrofit	will Not be Retrofit	8,760	-	-	-	-	-	-
Roosevelt Schools NY	Washington-Rose Elementary School	524	SW	Stairwells S3	1	1	0.0534	0.0220	2x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, HI	3,750	0.05	0.02	0.03	200	83	118
Roosevelt Schools NY	Washington-Rose Elementary School	525	SW	Stairwells S3	1	1	0	0	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, HI	3750	0.0534	0.022	0.0314	200	83	117.75
Roosevelt Schools NY	Washington-Rose Elementary School	526	SW	Stairwells S3	5	5	0	0	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	3750	0.2670	0.11	0.157	1,001	413	588.75
Roosevelt Schools NY	Washington-Rose Elementary School	527	SW	Stairwells S3	1	1	0	0	2x4, 4-Lamp T8	LED Int. Driver Lamps, (4) 4' Lamps	3750	0.1057	0.044	0.0617	396	165	231.38
Roosevelt Schools NY	Washington-Rose Elementary School	528	SW	Stairwells S3	2	2	0	0	CF PL 26w	LED Retrofit Can Kit, 4 Inch, NLO	3750	0.0560	0.014	0.042	210	53	157.50
Roosevelt Schools NY	Washington-Rose Elementary School	529	B	Basement B	47	47	0	0	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	750	2.5098	1.034	1.4758	1,882	776	1,106.85
Roosevelt Schools NY	Washington-Rose Elementary School	530	B	Basement B	9	9	0	0	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps	750	0.4806	0.198	0.2826	360	149	211.95
Roosevelt Schools NY	Washington-Rose Elementary School	531	B	Basement B	4	4	0	0	1x4, 2-Lamp T8	LED Int. Driver Lamps, (2) 4' Lamps, XL	750	0.2136	0.088	0.1256	160	66	94.20
Roosevelt Schools NY	Washington-Rose Elementary School	532	1	Conference Room	6	6	0	0	CF PL (2) 26w	LED Retrofit Can Kit, 8 Inch, HLO	2200	0.3360	0.102	0.234	739	224	514.80
Roosevelt Schools NY	Washington-Rose Elementary School	533	1	New Layout	90	90	-	-	New Layout	No Retrofit	8760	-	0	0	-	-	-

Roosevelt UFSD, NY
Exhibit D-5-1
ECM 1 - LED Lighting and Lighting Controls Upgrade
Lighting Controls Line by Line

Site Name	Building Name	Index	Floor	Location	Control Qty	Total Proposed Load	Proposed Control Description	Proposed Control Load Reduction	Proposed Control Hours Reduction	Total Hours	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Roosevelt Schools NY	Centennial Avenue Elementary School	309	1	Gym 1064	1	1.6640	Occ. Sensor, Fixture Mount, PIR, Dimming Control	100%	40%	2,500	4,160	2,496	1,664
Roosevelt Schools NY	Roosevelt High School	133	1	Practice Room A109b	1	0.0480	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	22%	2,119	102	79	22
Roosevelt Schools NY	Roosevelt High School	148	1	Administration Office A110	1	0.0960	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	22%	2,119	203	159	45
Roosevelt Schools NY	Roosevelt High School	149	1	Administration Office A110a	1	0.0480	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	22%	2,119	102	79	22
Roosevelt Schools NY	Roosevelt High School	150	1	Administration Office A110b	1	0.0480	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	22%	2,119	102	79	22
Roosevelt Schools NY	Roosevelt High School	179	1	Control Room	1	0.0360	Wall Switch, Dimming X2	100%	0%	1,760	63	63	-
Roosevelt Schools NY	Roosevelt High School	192	1	Guidance A122	1	0.2880	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	1,440	415	373	41
Roosevelt Schools NY	Roosevelt High School	193	1	Guidance A122a	1	0.0480	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	1,440	69	62	7
Roosevelt Schools NY	Roosevelt High School	194	1	Guidance A122b	1	0.0480	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	1,440	69	62	7
Roosevelt Schools NY	Roosevelt High School	195	1	Guidance A122c	1	0.0480	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	1,440	69	62	7
Roosevelt Schools NY	Roosevelt High School	196	1	Guidance A122d	1	0.0480	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	1,440	69	62	7
Roosevelt Schools NY	Roosevelt High School	197	1	Guidance A122e	1	0.0480	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	1,440	69	62	7
Roosevelt Schools NY	Roosevelt High School	198	1	Guidance A122f	1	0.0960	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	1,440	138	124	14
Roosevelt Schools NY	Roosevelt High School	199	1	Guidance A122g	1	0.0480	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	1,440	69	62	7
Roosevelt Schools NY	Roosevelt High School	200	1	Guidance A122h	1	0.0480	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	1,440	69	62	7
Roosevelt Schools NY	Roosevelt High School	215	1	Library 011b	1	0.0480	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	154	138	15
Roosevelt Schools NY	Roosevelt High School	216	1	Library 011c	1	0.0720	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	230	207	23
Roosevelt Schools NY	Roosevelt High School	219	1	Schools Store B131	1	0.0480	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	1,440	69	62	7
Roosevelt Schools NY	Roosevelt High School	220	1	Custodian Office B133	1	0.0480	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	1,440	69	62	7
Roosevelt Schools NY	Roosevelt High School	231	1	Prep Room A141a	1	0.0720	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	22%	2,119	153	119	34
Roosevelt Schools NY	Roosevelt High School	235	1	Prep Room A145a	1	0.0720	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	22%	2,119	153	119	34
Roosevelt Schools NY	Roosevelt High School	239	1	Prep Room A148a	1	0.0480	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	22%	2,119	102	79	22
Roosevelt Schools NY	Roosevelt High School	299	1	Office 027e	1	0.0480	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	4,000	192	173	19
Roosevelt Schools NY	Roosevelt High School	331	1	Office 010a	1	0.0480	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	600	29	26	3
Roosevelt Schools NY	Roosevelt High School	332	1	Office 010b	1	0.0480	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	154	138	15
Roosevelt Schools NY	Roosevelt High School	333	1	Office 010c	1	0.0720	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	230	207	23
Roosevelt Schools NY	Roosevelt High School	334	1	Office 010d	1	0.1440	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	461	415	46
Roosevelt Schools NY	Roosevelt High School	341	1	Open 0ffice 055	1	0.0480	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	154	138	15
Roosevelt Schools NY	Roosevelt High School	342	1	Open 0ffice 055	1	0.0480	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	154	138	15
Roosevelt Schools NY	Roosevelt High School	343	1	0ffice 055a	1	0.0560	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	179	161	18
Roosevelt Schools NY	Roosevelt High School	344	1	0ffice 054	1	0.0480	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	154	138	15
Roosevelt Schools NY	Roosevelt High School	345	1	0ffice 055b	1	0.0480	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	154	138	15
Roosevelt Schools NY	Roosevelt High School	346	1	0ffice 058	1	0.0960	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	307	276	31
Roosevelt Schools NY	Roosevelt High School	347	1	Open 0ffice 056	1	0.1440	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	461	415	46
Roosevelt Schools NY	Roosevelt High School	348	1	0ffice 056a	1	0.0960	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	307	276	31
Roosevelt Schools NY	Roosevelt High School	352	1	Staff Room 062	1	0.0960	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	307	276	31
Roosevelt Schools NY	Roosevelt High School	353	1	Open 0ffice 064	1	0.1760	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	563	507	56
Roosevelt Schools NY	Roosevelt High School	355	1	0ffice 064d	1	0.1680	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	538	484	54
Roosevelt Schools NY	Roosevelt High School	356	1	0ffice 064c	1	0.0480	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	154	138	15
Roosevelt Schools NY	Roosevelt High School	357	1	0ffice 064b	1	0.0480	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	154	138	15
Roosevelt Schools NY	Roosevelt High School	358	1	0ffice 064c	1	0.0480	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	154	138	15
Roosevelt Schools NY	Roosevelt High School	359	1	0ffice 064d	1	0.1440	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	461	415	46
Roosevelt Schools NY	Roosevelt High School	360	1	Open 0ffice 066	1	0.1440	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	461	415	46
Roosevelt Schools NY	Roosevelt High School	361	1	0ffice 066a	1	0.0480	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	154	138	15
Roosevelt Schools NY	Roosevelt High School	362	1	0ffice 066b	1	0.0960	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	307	276	31
Roosevelt Schools NY	Roosevelt High School	363	1	0ffice 066c	1	0.0480	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	154	138	15
Roosevelt Schools NY	Roosevelt High School	365	1	0ffice 064e	1	0.0240	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	77	69	8
Roosevelt Schools NY	Roosevelt High School	366	1	Open 0ffice 057	1	0.3840	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	1,229	1,106	123
Roosevelt Schools NY	Roosevelt High School	367	1	0ffice 057a	1	0.0480	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	154	138	15
Roosevelt Schools NY	Roosevelt High School	371	1	0ffice 057d	1	0.0480	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	154	138	15
Roosevelt Schools NY	Roosevelt High School	372	1	Open 0ffice 054	1	0.1440	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	461	415	46
Roosevelt Schools NY	Roosevelt High School	373	1	0ffice 054a	1	0.0480	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	154	138	15
Roosevelt Schools NY	Roosevelt High School	374	1	0ffice 054b	1	0.0480	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	154	138	15
Roosevelt Schools NY	Roosevelt High School	375	1	0ffice 054c	1	0.0480	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	154	138	15
Roosevelt Schools NY	Roosevelt High School	376	1	Open 0ffice 053	1	0.0640	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	205	184	20
Roosevelt Schools NY	Roosevelt High School	378	1	0ffice 053a	1	0.0720	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	230	207	23

Roosevelt UFSD, NY
Exhibit D-5-1
ECM 1 - LED Lighting and Lighting Controls Upgrade
Lighting Controls Line by Line

Site Name	Building Name	Index	Floor	Location	Control Qty	Total Proposed Load	Proposed Control Description	Proposed Control Load Reduction	Proposed Control Hours Reduction	Total Hours	Total kWh Existing	Total kWh Proposed	Total kWh Saved
Roosevelt Schools NY	Roosevelt High School	379	1	0ffice 053b	1	0.0960	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	307	276	31
Roosevelt Schools NY	Roosevelt High School	380	1	0ffice 053c	1	0.0960	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	307	276	31
Roosevelt Schools NY	Roosevelt High School	381	1	Open 0ffice 051	1	0.1280	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	410	369	41
Roosevelt Schools NY	Roosevelt High School	385	1	0ffice 051 Exam1	1	0.0480	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	154	138	15
Roosevelt Schools NY	Roosevelt High School	386	1	Office Np	1	0.0240	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	77	69	8
Roosevelt Schools NY	Roosevelt High School	387	1	Social Work	1	0.0480	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	154	138	15
Roosevelt Schools NY	Roosevelt High School	391	1	Open 0ffice 015	1	0.1440	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	461	415	46
Roosevelt Schools NY	Roosevelt High School	393	1	0ffice 015c	1	0.0480	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	154	138	15
Roosevelt Schools NY	Roosevelt High School	394	1	0ffice 015b	1	0.0480	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	154	138	15
Roosevelt Schools NY	Roosevelt High School	395	1	0ffice 015d	1	0.0480	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	154	138	15
Roosevelt Schools NY	Roosevelt High School	416	1	Noc Room	1	0.0480	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	154	138	15
Roosevelt Schools NY	Roosevelt High School	417	1	Noc Room	1	0.0480	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	154	138	15
Roosevelt Schools NY	Roosevelt High School	418	1	Noc Room	1	0.2640	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	845	760	84
Roosevelt Schools NY	Roosevelt High School	424	1	0ffice 038	1	0.0640	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	205	184	20
Roosevelt Schools NY	Roosevelt High School	426	1	0ffice 038e	1	0.0220	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	70	63	7
Roosevelt Schools NY	Roosevelt High School	427	1	0ffice 038b	1	0.0480	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	154	138	15
Roosevelt Schools NY	Roosevelt High School	428	1	0ffice 038d	1	0.0960	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	307	276	31
Roosevelt Schools NY	Roosevelt High School	429	1	0ffice 038c	1	0.0440	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	3,200	141	127	14
Roosevelt Schools NY	Roosevelt High School	431	1	Annx Gym 040	1	3.4080	Occ. Sensor, Fixture Mount, PIR, Dimming Control	100%	45%	3,832	13,059	7,183	5,877
Roosevelt Schools NY	Roosevelt High School	450	1	Gym 033	1	6.0120	Occ. Sensor, Fixture Mount, PIR, Dimming Control	100%	45%	3,832	23,038	12,671	10,367
Roosevelt Schools NY	Roosevelt High School	33	2	Storage St1	1	0.0720	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	750	54	49	5
Roosevelt Schools NY	Roosevelt High School	34	2	Conference Room	1	0.0720	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	10%	1,000	72	65	7
Roosevelt Schools NY	Roosevelt High School	37	2	Classroom A222c	1	0.2160	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	22%	2,119	458	357	101
Roosevelt Schools NY	Roosevelt High School	48	2	Classroom B233	1	0.0720	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	22%	2,119	153	119	34
Roosevelt Schools NY	Roosevelt High School	54	2	Prep Room B241a	1	0.0720	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	22%	2,119	153	119	34
Roosevelt Schools NY	Roosevelt High School	97	2	Classroom C267	1	0.0720	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	22%	2,119	153	119	34
Roosevelt Schools NY	Roosevelt High School	98	2	Classroom C267a	1	0.0480	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	22%	2,119	102	79	22
Roosevelt Schools NY	Roosevelt High School	99	2	Classroom C267b	1	0.0480	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	22%	2,119	102	79	22
Roosevelt Schools NY	Roosevelt High School	100	2	Classroom C267c	1	0.0480	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	22%	2,119	102	79	22
Roosevelt Schools NY	Roosevelt High School	124	2	Prep Room A103a	1	0.0720	Occ. Sensor, Wallswitch, DT, 0-10v Dim	100%	22%	2,119	153	119	34
Roosevelt Schools NY	Roosevelt Middle School	400	1	Gym	1	3.4080	Occ. Sensor, Fixture Mount, PIR, Dimming Control	100%	40%	3,221	10,977	6,586	4,391
Roosevelt Schools NY	Roosevelt Middle School	479	1	Cafeteria	1	0.0800	VendingMiser Snack Machine Control	100%	40%	8,760	701	420	280
Roosevelt Schools NY	Roosevelt Middle School	480	1	Cafeteria	1	0.3400	VendingMiser Cold Drink Machine Control	100%	34%	8,760	2,978	1,966	1,013
Roosevelt Schools NY	Ulysses Byas Elementary School	100	1	Gym	1	2.0880	Occ. Sensor, Fixture Mount, PIR, Dimming Control	100%	40%	2,500	5,220	3,132	2,088
Roosevelt Schools NY	Washington-Rose Elementary School	493	1	Gym	1	1.3920	Occ. Sensor, Fixture Mount, PIR, Dimming Control	100%	40%	2,500	3,480	2,088	1,392

Roosevelt UFSD, NY
Exhibit D-5 Chart
Boiler Efficiency Spreadsheet

EXISTING												
Building	Equipment Label	Qty	Location	Boiler(s) Replaced [Y/N]	Add Burner Controls / Replace (Y/N)	Existing Fuel	Manufacturer	Model No.	Total Input Capacity [MBH]	Heating Medium	Combustion Efficiency	Percentage of Building Served
Centennial Avenue Elementary School	CA-B1,2	2	Boiler Room	N	N	Natural Gas	HB Smith	28A	9,034	Hot Water	80%	100%
Washington-Rose Elementary School	WR-B1,2	2	Boiler Room	Y	N	Natural Gas	HB Smith	28HE	8,586	Hot Water	82%	100%
Ulysses Byas Elementary School	UB-B1,2	2	Boiler Room	N	N	Natural Gas	HB Smith	28HE	8,586	Hot Water	82%	100%
Roosevelt Middle School	RM-B1	1	Boiler Room	Y	N	Natural Gas	HB Smith	28HE	4,293	Hot Water	82%	33%
Roosevelt Middle School	RH-B2,3	2	Boiler Room	Y	N	Natural Gas	HB Smith	28HE	8,586	Hot Water	82%	67%
Roosevelt High School	RH-B1,2,3	3	Boiler Room	Y	N	Natural Gas	HB Smith	28HE	12,879	Hot Water	82%	100%
Totals		12							51,964			

PROPOSED										
Building	Equipment Label	Boiler(s) Replaced [Y/N]	Qty	Proposed Fuel	Manufacturer	Model No.	Total Input Capacity [MBH]	Heating Medium	Combustion Efficiency	Percentage of Building Served
Washington-Rose Elementary School	WR-B1,2	Y	2	Natural Gas	Aerco	Array 4000	8,000	Hot Water	90.0%	100.0%
Roosevelt Middle School	RM-B1	Y	1	Natural Gas	Riello	Array 4000	4,000	Hot Water	90.0%	33.0%
Roosevelt Middle School	RH-B2,3	Y	2	Natural Gas	Riello	Array 4000	8,000	Hot Water	90.0%	67.0%
Roosevelt High School	RH-B1,2,3	Y	4	Natural Gas	Riello	Array 4000 & 3000	15,000	Hot Water	90.0%	100.0%
Totals			9				35,000			

Roosevelt UFSD, NY
Exhibit D-5 Chart
Boiler Efficiency Spreadsheet

EXISTING OVERALL BOILER EFFICIENCY

Building	Centennial Avenue Elementary School	Washington-Rose Elementary School	Ulysses Byas Elementary School	Roosevelt Middle School	Roosevelt Middle School	Roosevelt High School
Location	Boiler Room	Boiler Room	Boiler Room	Boiler Room	Boiler Room	Boiler Room
Label	CA-B1,2	WR-B1,2	UB-B1,2	RM-B1	RH-B2,3	RH-B1,2,3
Capacity [MBTU/Hr]	9,034	8,586	8,586	4,293	8,586	12,879
Quantity	2	2	2	1	2	3
Existing Fuel	Natural Gas	Natural Gas	Natural Gas	Natural Gas	Natural Gas	Natural Gas
Percentage of Building Load [%]	100%	100%	100%	33%	67%	100%
Heating Medium	Hot Water	Hot Water	Hot Water	Hot Water	Hot Water	Hot Water
Combustion Efficiency [%]	80.0%	82.0%	82.0%	82.0%	82.0%	82.0%
Losses Due to Radiation [% of MCR]	**1.0%**	**1.0%**	**1.0%**	**1.0%**	**1.0%**	**1.0%**
Losses Due to Blowdown [% of MCR]	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
MCR of Boilers [MMBTU/Hr]	9.0	8.6	8.6	4.3	8.6	12.9
% Makeup Water [%]	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**8.0%**
Makeup T.D.S. [PPM]	**80**	**80**	**80**	**80**	**80**	**80**
Blowdown T.D.S. [PPM]	**3,500**	**3,500**	**3,500**	**3,500**	**3,500**	**3,500**
Annual Boiler Usage [MMBTU]	3,199	5,098	5,186	2,477	5,029	8,707
Feedwater Temperature [°F]	**180**	**180**	**180**	**180**	**180**	**180**
Condensate Return Temperature [°F]	**200**	**200**	**200**	**200**	**200**	**200**
Makeup Water Temperature [°F]	**60**	**60**	**60**	**60**	**60**	**60**
Hours of Operation [Hrs/Yr]	4,016	4,016	4,016	4,016	4,016	4,016
Blowdown Temperature [°F]	220	220	220	220	220	220
Heat Required to Raise a lb of Steam [BTU/lb]	980	980	980	980	980	980
Boiler Load Rate [%]	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Present Blowdown Rate [lbs/lb Steam]	-	-	-	-	-	-
Heat Content of Blowdown [BTU/lb]	-	-	-	-	-	-
Blowdown Loss [%]	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Radiation Losses [%]	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Overall Boiler Efficiency [%]	**79.0%**	**81.0%**	**81.0%**	**81.0%**	**81.0%**	**81.0%**

Roosevelt UFSD, NY
Exhibit D-5 Chart
Boiler Efficiency Spreadsheet

PROPOSED OVERALL BOILER EFFICIENCY

	Centennial Avenue Elementary School	Washington-Rose Elementary School	Ulysses Byas Elementary School	Roosevelt Middle School	Roosevelt Middle School	Roosevelt High School
Boiler Addition	N	Y	N	Y	Y	Y
Burner Control Links	N	N	N	N	N	N
Location	Boiler Room	Boiler Room	Boiler Room	Boiler Room	Boiler Room	Boiler Room
Label	-	WR-B1,2	-	RM-B1	RH-B2,3	RH-B1,2,3
Quantity to be Replaced	-	2	-	1	2	4
Percent of Building Load [%]	-	100%	-	33%	67%	100%
Proposed Fuel	-	Natural Gas	-	Natural Gas	Natural Gas	Natural Gas
Capacity [MBTU/Hr]	-	8,000	-	4,000	8,000	15,000
Heating Medium	-	Hot Water	-	Hot Water	Hot Water	Hot Water
Combustion Efficiency [%]	-	90.0%	-	90.0%	90.0%	90.0%
Losses Due to Radiation [% of MCR]	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Losses Due to Blowdown [% of MCR]	2.0%	0.0%	2.0%	0.0%	0.0%	0.0%
% Makeup Water [%]	0.0%	0.0%	0.0%	0.0%	0.0%	8.0%
Makeup T.D.S. [PPM]	80	80	80	80	80	80
Blowdown T.D.S. [PPM]	3,500	3,500	3,500	3,500	3,500	3,500
Annual Boiler Usage [MMBTU]	-	5,098	-	2,477	5,029	8,707
Feedwater Temperature [°F]	180	180	180	180	180	180
MCR of Boilers [MMBTU/Hr]	-	8.0	-	4.0	8.0	15.0
Condensate Return Temperature [°F]	200	200	200	200	200	200
Makeup Water Temperature [°F]	60	60	60	60	60	60
Hours of Operation [Hrs/Yr]	4,016	4,016	4,016	4,016	4,016	4,016
Blowdown Temperature [°F]	220	220	220	220	220	220
Heat Required to Raise a lb of Steam [BTU/lb]	980	980	980	980	980	980
Boiler Load Rate [%]	-	50.0%	-	50.0%	50.0%	50.0%
Present Blowdown Rate [lbs/lb Steam]	-	-	-	-	-	-
Heat Content of Blowdown [BTU/lb]	-	-	-	-	-	-
Blowdown Loss [%]	-	0.0%	-	0.0%	0.0%	0.0%
Radiation Losses [%]	-	1.0%	-	1.0%	1.0%	1.0%
*Overall Boiler Efficiency [%]	**79.0%**	**89.0%**	**81.0%**	**89.0%**	**89.0%**	**89.0%**

*For locations where boilers are not being replaced, the existing boiler efficiency is equal to the proposed boiler efficiency

Roosevelt UFSD, NY
Exhibit D-5-2
ECM 2 - Boiler Plant Upgrades

ECM DESCRIPTION

Install new high efficiency boilers to optimize plant efficiency and reduce equipment maintenance costs.

DATA / ASSUMPTIONS

Heating Season Hours 4,016 Hours

* Initial utility baseline reduced to account for micellaneous loads (domestic hot water, science labs, and kitchen usage where applicable)
* An adjusted baseline is used for the boiler baseline usage as to not double-dip on savings

COMMISSIONING

Verify all aspects of boiler operation including controls and safety measures. Verify air/fuel ratio is consistent throughout firing range. Provide training of the boiler operators.

RECOVERY/SAFETY FACTOR

Thermal Safety Factor [%] = **5%**

A safety factor of 5% is used to account for parameter variability

FORMULAE

$Q_{savings} = ((\eta_{NEW} - \eta_{OLD}) / \eta_{OLD}) \cdot Fuel_{ADJ}$

Variable	Units	Description
$Q_{savings}$	Therms	Thermal Savings
η_{NEW}	**%**	Efficiency of New Boiler
η_{OLD}	**%**	Efficiency of Old Boiler
$Fuel_{ADJ}$	Therms	Adjusted Boiler Fuel Usage

Roosevelt UFSD, NY
Exhibit D-5-2
ECM 2 - Boiler Plant Upgrades

*Inputs are blue

Building	Label	Boilers to be Added
Washington-Rose Elementary School	WR-B1,2	2
Roosevelt Middle School	RM-B1	1
Roosevelt Middle School	RH-B2,3	2
Roosevelt High School	RH-B1,2,3	4
Totals		**9**

CALCULATIONS

	Washington-Rose Elementary School	Roosevelt Middle School	Roosevelt Middle School	Roosevelt High School
No. of Units to be Replaced	2	1	2	4
Fuel Switch	N	N	N	N
Existing Fuel	Natural Gas	Natural Gas	Natural Gas	Natural Gas
Proposed Fuel	Natural Gas	Natural Gas	Natural Gas	Natural Gas
Existing Boiler Efficiency [%]	81.0%	81.0%	81.0%	81.0%
Proposed Boiler Efficiency [%]	89.0%	89.0%	89.0%	89.0%
Improvement in Boiler Efficiency [%]	8.0%	8.0%	8.0%	8.0%
Annual Boiler Fuel Use [Therms]	50,985	24,770	50,291	87,073
Adjusted Boiler Usage [Therms]	48,842	23,906	48,537	82,919
Percentage of Building Load [%]	100%	33%	67%	100%
Safety Factor [%]	**20%**	**20%**	**20%**	**20%**
Thermal Savings [Therms]	3,859	1,889	3,835	6,552

Notes:
Replacing the existing boilers with new, high efficiency units will reduce operating costs at this location.
Note that the boiler efficiency discussed here is the overall boiler thermal efficiency, not just its combustion efficiency. The value of this number will be much lower than for combustion efficiency alone as it includes losses from radiation, blowdown, and other related losses. The value for annual boiler fuel has been adjusted for the effect of other ECMs.

SAVINGS SUMMARY

Building ID	kWh Savings	kW Savings	Thermal Savings	Safety Factor
	kWh	kW	Therms	%
Centennial Avenue Elementary School	-	-	-	0.0%
Washington-Rose Elementary School	-	-	3,859	20.0%
Ulysses Byas Elementary School	-	-	-	0.0%
Roosevelt Middle School	-	-	5,724	20.0%
Roosevelt High School	-	-	6,552	20.0%
Subtotal	-	-	16,135	

Roosevelt UFSD, NY
Exhibit D-5-2
ECM 2 - Boiler Plant Upgrades

ECM DESCRIPTION

Switch third party natural gas suppliers

DATA / ASSUMPTIONS

Estimated cost of Natural Gas based on baseline rates of Centennial Avenue School National Grid supplier rate.

RECOVERY/SAFETY FACTOR

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

CALCULATIONS

	Washington-Rose Elementary School	Roosevelt Middle School
Third Party Supplier Switch Applicable (Y/N)	**Y**	**Y**
Existing Supplier	**Gateway Energy**	**Gateway Energy**
Proposed Supplier	**National Grid**	**National Grid**
Adjusted Building Usage [Therms]	31,938	48,662
Existing Cost of Natural Gas [$/Therm]	$ 1.32	$ 1.26
Estimated Cost of Natural Gas [$/Therm]	$ 1.08	$ 1.08
Estimated Cost Difference of Natural Gas [$/Therm]	**$ 0.24**	**$ 0.18**
Post Project Natural Gas Cost Savings [$]	$ 7,701	$ 8,918
Safety Factor [%]	**15%**	**15%**
Savings [$]	$ 6,546	$ 7,580

Roosevelt UFSD, NY
Exhibit D-5-2
ECM 2 - Boiler Plant Upgrades

ECM DESCRIPTION

Utility Billing error correction. Remove State Sales Tax from the bill.

DATA / ASSUMPTIONS

None

CALCULATIONS

	Roosevelt High School
Error Correction Applicable (Y/N)	Y
Original Tax Amount [$]	$ 8,105.18
Proposed Tax Amount [$]	$ -
Savings [$]	$ 8,105

Roosevelt UFSD, NY
Exhibit D-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
Washington-Rose Elementary School	WR-DHW1	2	Boiler Room	N	Y	Natural Gas	AO Smith		365	119	80%	100%
Roosevelt High School	RH-DHW1	2	Boiler Room	N	Y	Natural Gas	Lochinvar		1,500	-	80%	100%
Totals		4							1,865			

PROPOSED								
Building	Qty	Fuel	Manufacturer	Model No.	Capacity [MBH]	Combustion Efficiency [%]	Fed Off Boiler (Y/N)	Capacity (Gal)
Washington-Rose Elementary School	2	Natural Gas	AO Smith	IT-300	N/A	89.0%	Y	80
Roosevelt High School	2	Natural Gas	AO Smith	IT-600	N/A	89.0%	Y	158
	4				-			

EXISTING DHW EFFICIENCY

	Washington-Rose Elementary School	Roosevelt High School
Building		
Label	WR-DHW1	RH-DHW1
Quantity	2	2
Location	Boiler Room	Boiler Room
Fuel Type	Natural Gas	Natural Gas
Capacity (MBTU)	365	1,500
Percentage of Building Load	100%	100%
Current Efficiency	80.0%	80.0%

PROPOSED DHW EFFICIENCY

	Washington-Rose Elementary School	Roosevelt High School
DHW Replacement	Y	Y
Isolate Storage Tank	N	N
Label	WR-DHW1	RH-DHW1
Fuel Type	Natural Gas	Natural Gas
Quantity	2	2
Location	Boiler Room	Boiler Room
Capacity (MBTU)	N/A	N/A
Proposed Efficiency	89.0%	89.0%

Roosevelt UFSD, NY
Exhibit D-5-3
ECM 3 - DHW Heater Upgrades
DHW Heater Replacement

ECM DESCRIPTION

Existing domestic hot water heater(s) will be replaced with indirect heaters fed by the Heating Hot Water Boilers.

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

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

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

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_{ADJ-FO}	Gallons	Adjusted Boiler Usage in Gallons (Fuel Oil)
F_{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	Existing Fuel	Proposed Fuel	Existing Efficiency	Proposed Efficiency	% of Building Load	Indirect DHW HEX Quantity
Washington-Rose Elementary School	WR-DHW1	2	Natural Gas	Natural Gas	80.0%	89.0%	100%	2
Roosevelt High School	RH-DHW1	2	Natural Gas	Natural Gas	80.0%	89.0%	100%	2
Totals		**4**						**4**

Roosevelt UFSD, NY
Exhibit D-5-3
ECM 3 - DHW Heater Upgrades
DHW Heater Replacement

A. REPLACE EXISTING DOMESTIC HOT WATER HEATERS

	Washington-Rose Elementary School	Roosevelt High School
Label	WR-DHW1	RH-DHW1
Quantity	2	2
Fuel Switch	N	N
Existing Fuel	Natural Gas	Natural Gas
Proposed Fuel	Natural Gas	Natural Gas
Current DHW System Efficiency [%]	80.0%	80.0%
Proposed DHW System Efficiency [%]	89.0%	89.0%
Improvement DHW System Efficiency [%]	9.0%	9.0%
Annual DHW Heater Baseline [Therms]	2,683	4,583
Percentage of DHW Building Load [%]	100%	100%
Safety Factor	0%	0%
Thermal Savings [Therms]	271	463

SAVINGS SUMMARY

Building ID	kWh Savings	kW Savings	Thermal Savings	Fuel Switch Savings	Thermal Safety Factor	Electric Safety Factor
	kWh	kW	Therms	$	%	%
Centennial Avenue Elementary School	-	-	-	$ -	0.0%	0.0%
Washington-Rose Elementary School	-	-	271	$ -	0.0%	0.0%
Ulysses Byas Elementary School	-	-	-	$ -	0.0%	0.0%
Roosevelt Middle School	-	-	-	$ -	0.0%	0.0%
Roosevelt High School	-	-	463	$ -	0.0%	0.0%
Subtotal	-	-	735	-		

Roosevelt UFSD, NY
Exhibit D-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)
Centennial Avenue Elementary School	CES-CWP-1,2	Lead/Lag	2	30.0	83.0%	Y	Y
Totals			2	30.0			

	Centennial Avenue Elementary School
Equipment Label	CES-CWP-1,2
Equipment Configuration	Lead/Lag
Quantity	2
Horsepower [HP]	30.0
Existing Efficiency [%]	83.0%
Replace Motor	Y
Install VFD	Y

Roosevelt UFSD, NY
Exhibit D-5-4
ECM 4 - Mechanical Upgrades
VFD & Motor Replacement

ECM DESCRIPTION

Install Variable Frequency Drives (VFDs) to modulate speed based on actual demand.

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

VFD

$W_{VFDSavings} = W_{EXISTING} - W_{VFD}$

$W_{VFD} = \sum_{0}^{60} [((HP \cdot 0.746) \cdot Lf / \eta_{PROPOSED}) \cdot f^{2.3} \cdot t_f \cdot t_{PROPOSED} / \eta_{VFD}]$

Variable	Units	Description
$W_{MotorSavings}$	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
$\eta_{EXISTING}$	%	Existing efficiency of motor
$\eta_{PROPOSED}$	%	Proposed efficiency of motor
$\sum_{0}^{60}$	-	Summation of all frequences (0 Hz to 60 Hz)
f	%	Frequency of drive, as a percentage of full frequency (60 Hz)
t_f	%	Percentage of time motor will run at a particular frequency
η_{VFD}	%	VFD efficiency
W_{VFD}	kWh	Proposed electrical consumption with VFD
$W_{EXISTING}$	kWh	Existing electrical consumption of motor
$W_{PROPOSED}$	kWh	Proposed electrical consumption of motor

Roosevelt UFSD, NY
Exhibit D-5-4
ECM 4 - Mechanical Upgrades
VFD & Motor Replacement

ASSUMPTIONS / INPUTS

* Inputs are in blue

Building	Equipment Label	Configuration	Qty	Horsepower [HP]	Existing Efficiency [%]	Replace Motor	Install VFD
Centennial Avenue Elementary School	CES-CWP-1,2	Lead/Lag	2	30.0	83.0%	Y	Y
Total							

CALCULATIONS (MOTOR)

	Centennial Avenue Elementary School
Equipment Label	CES-CWP-1,2
Equipment Configuration	Lead/Lag
Replace Motor	Y
Install VFD	Y
Quantity	2
Existing Motor Horsepower [HP]	30.0
Proposed Motor Horsepower [HP]	30.0
Existing Run Hours [Hrs]	824
Proposed Run Hours [Hrs]	531
Load Factor [%]	65.0%
Existing Motor Efficiency [%]	83.0%
Proposed Motor Efficiency [%]	93.6%
Existing kW [kW]	17.53
Proposed kW [kW]	15.54
Existing Motor kWh Consumption [kWh]	14,437
Proposed Motor kWh Consumption w/o VFD [kWh]	8,250
Proposed Motor kWh Consumption w/ VFD [kWh]	4,583
Electric Safety Factor [%]	0%
kW Savings [kW]	1.98
kWh Savings [kWh]	9,855

Roosevelt UFSD, NY
Exhibit D-5-4
ECM 4 - Mechanical Upgrades
VFD & Motor Replacement

MOTOR RUN PERCENTAGES AT RESPECTIVE SPEED

30%	0%
40%	0%
50%	12%
60%	12%
70%	22%
80%	29%
90%	20%
100%	5%
Total	100%

KWH CONSUMPTION W/ VFD

30%	0
40%	0
50%	207
60%	315
70%	824
80%	1,476
90%	1,335
100%	425

KW LOAD AT VARIOUS SPEEDS

30%	1.00
40%	1.95
50%	3.25
60%	4.95
70%	7.05
80%	9.59
90%	12.57
100%	16.02

SAVINGS SUMMARY

Building ID	kWh Savings	kW Savings	Electric Safety Factor
	kWh	kW	%
Centennial Avenue Elementary School	9,855	1.98	0.0%
Washington-Rose Elementary School	-	-	0.0%
Ulysses Byas Elementary School	-	-	0.0%
Roosevelt Middle School	-	-	0.0%
Roosevelt High School	-	-	0.0%
Subtotal	9,855	1.98	

Roosevelt UFSD, NY
Exhibit D-5 Chart
Condensing Unit Replacement Chart

EXISTING								
Building	Equipment Label	Qty	Replace (Y/N)	Manufacturer	Model No.	Area Served	Capacity [Tons]	Existing EER
Roosevelt Middle School	Chiller 2 & Chiller 3	3	Y	McQuay		Entire Building	375.0	12.0
Ulysses Byas Elementary School	RTU	26	Y	McQuay		Entire Building	325.0	12.0
Centennial Avenue Elementary S	IT Closet	3	Y			IT Closet	6.0	10.0
Roosevelt Middle School	IT Closet	2	Y			IT Closet	4.0	10.0
Totals		34					710.0	

PROPOSED				
Manufacturer	Model No.	Qty	Capacity [Tons]	Proposed EER
		3	375.0	13.0
		26	325.0	13.0
		3	6.0	13.0
		2	4.0	13.0
		34	710.0	

EXISTING CONDENSING UNIT SPECIFICATIONS

	Roosevelt Middle School	Ulysses Byas Elementary School	Centennial Avenue Elementary School	Roosevelt Middle School
Building				
Label	Chiller 2 & Chiller 3	RTU	IT Closet	IT Closet
Area Serving	Entire Building	Entire Building	IT Closet	IT Closet
Quantity	3	26	3	2
Capacity [Tons]	375.0	325.0	6.0	4.0
Existing EER	12.0	12.0	10.0	10.0

PROPOSED CONDENSING UNIT SPECIFICATIONS

	Roosevelt Middle School	Ulysses Byas Elementary School	Centennial Avenue Elementary School	Roosevelt Middle School
CU Replacement	Y	Y	Y	Y
Label	Chiller 2 & Chiller 3	RTU	IT Closet	IT Closet
Area Serving	Entire Building	Entire Building	IT Closet	IT Closet
Quantity	3	26	3	2
Tonnage	375.0	325.0	6.0	4.0
Proposed EER	13.0	13.0	13.0	13.0

Roosevelt UFSD, NY
Exhibit D-5-4
ECM 4 - Mechanical Upgrades
Condensing Unit Replacement

ECM DESCRIPTION

Replace existing compressors in respective buildings with new high efficiency compressors

DATA / ASSUMPTIONS

Run Hours based on occupancy schedule
Full Load Design Temperature [°F] = **92.5**

COMMISSIONING

Start up equipment ensure proper operation

RECOVERY/SAFETY FACTOR

Electric Safety Factor [%] = **10%**

FORMULAE

REPLACEMENT

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

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

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

Variable	Units	Description
$W_{SAVINGS}$	kWh	Electrical Savings
$W_{C\text{-}EXT}$	kWh	Existing condensing unit Consumption
$W_{C\text{-}PRP}$	kWh	Proposed condensing unit Consumption
$\sum_{60}^{105}$	-	Summation of all bins from 60°F to 105°F
C	Ton	Tonnage of condensing unit
η_{EXT}	-	Existing efficiency of condensing unit (EER)
η_{PRP}	-	Proposed efficiency of condensing unit (EER)
T_{DESIGN}	°F	Design Temperature of condensing unit (Usually 92.5°F)
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

* Inputs are in blue

Building	Label	Capacity [Tons]	Current EER	Proposed EER	Area Serving
Roosevelt Middle School	Chiller 2 & Chiller 3	375.0	12.0	13.0	Entire Building
Totals		**375.0**			

Roosevelt UFSD, NY
Exhibit D-5-4
ECM 4 - Mechanical Upgrades
Condensing Unit Replacement

CALCULATIONS

	Roosevelt Middle School
Label	Chiller 2 & Chiller 3
Area Serving	Entire Building
Condensing Unit Capacity [Tons]	375.0
Current EER	12.0
Proposed EER	13.0
Proposed Occ. Cooling Setpoint [°F]	76.0
Proposed Unocc. Cooling Setpoint [°F]	85.0
Current Condensing Unit Consumption [kWh]	78,732
Proposed Condensing Unit Consumption [kWh]	72,675
Electric Safety Factor [%]	**0%**
Electrical Savings [kWh]	6,056

Roosevelt UFSD, NY
Exhibit D-5-4
ECM 4 - Mechanical Upgrades
Condensing Unit Replacement

ROOSEVELT MIDDLE SCHOOL **Entire Building**

Amb. Temp Bin [°F]	Avgerage Temp. [°F]	01-08 Hours	09-16 Hours	17-24 Hours	Total Bin Hours	Occ.Bin Hours	Unocc. Bin Hours	Occ. Load [Tons]	Unocc. Load [Tons]	Occ. Consumption [Ton-Hrs]	Unocc. Consumption [Ton-Hrs]	Existing Total Consumption [kWh]	Proposed Total Consumption [kWh]	Total Electrical Savings [kWh]
COOLING														
100 to 105	102.5	-	-	-	-	-	-	375.0	375.0	-	-	-	-	-
95 to 100	97.5	-	3	-	3	2	1	375.0	375.0	804	321	1,125	1,038	87
90 to 95	92.5	-	18	3	21	13	8	375.0	375.0	5,022	2,853	7,875	7,269	606
85 to 90	87.5	-	100	18	118	75	43	261.4	125.0	19,509	5,420	24,929	23,011	1,918
80 to 85	82.5	37	292	126	455	238	217	147.7	-	35,112	-	35,112	32,411	2,701
75 to 80	77.5	189	289	247	725	284	441	34.1	-	9,692	-	9,692	8,946	746
70 to 75	72.5	275	200	270	745	240	505	-	-	-	-	-	-	-
65 to 70	67.5	236	184	245	665	217	448	-	-	-	-	-	-	-
60 to 65	62.5	232	158	196	586	189	397	-	-	-	-	-	-	-
Total		969	1,244	1,105	3,318	1,259	2,059					78,732	72,675	6,056

Roosevelt UFSD, NY
Exhibit D-5-4
ECM 4 - Mechanical Upgrades
Condensing Unit Replacement

SAVINGS SUMMARY

Building ID	kWh Savings	Electric Safety Factor
	kWh	%
Centennial Avenue Elementary School	-	5.0%
Washington-Rose Elementary School	-	0.0%
Ulysses Byas Elementary School	-	0.0%
Roosevelt Middle School	6,056	0.0%
Roosevelt High School	-	0.0%
Subtotal	6,056	

Roosevelt UFSD, NY
Exhibit D-5-4
ECM 4 - Mechanical Upgrades
Condensing Unit Replacement

ECM DESCRIPTION

Replace existing compressors in respective buildings with new high efficiency compressors

DATA / ASSUMPTIONS

Run Hours based on occupancy schedule
Full Load Design Temperature [°F] = **92.5**

COMMISSIONING

Start up equipment ensure proper operation

RECOVERY/SAFETY FACTOR

Electric Safety Factor [%] = **10%**

FORMULAE

REPLACEMENT

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

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

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

Variable	Units	Description
$W_{SAVINGS}$	kWh	Electrical Savings
$W_{C\text{-}EXT}$	kWh	Existing condensing unit Consumption
$W_{C\text{-}PRP}$	kWh	Proposed condensing unit Consumption
$\sum_{60}^{105}$	-	Summation of all bins from 60°F to 105°F
C	Ton	Tonnage of condensing unit
η_{EXT}	-	Existing efficiency of condensing unit (EER)
η_{PRP}	-	Proposed efficiency of condensing unit (EER)
T_{DESIGN}	°F	Design Temperature of condensing unit (Usually 92.5°F)
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

* Inputs are in blue

Building	Label	Capacity [Tons]	Current EER	Proposed EER	Area Serving
Ulysses Byas Elementary School	RTU	325.0	12.0	13.0	Entire Building
Totals		**325.0**			

Roosevelt UFSD, NY
Exhibit D-5-4
ECM 4 - Mechanical Upgrades
Condensing Unit Replacement

CALCULATIONS

	Ulysses Byas Elementary School
Label	RTU
Area Serving	Entire Building
Condensing Unit Capacity [Tons]	325.0
Current EER	12.0
Proposed EER	13.0
Proposed Occ. Cooling Setpoint [°F]	76.0
Proposed Unocc. Cooling Setpoint [°F]	85.0
Current Condensing Unit Consumption [kWh]	63,670
Proposed Condensing Unit Consumption [kWh]	58,773
Electric Safety Factor [%]	0%
Electrical Savings [kWh]	4,898

Roosevelt UFSD, NY
Exhibit D-5-4
ECM 4 - Mechanical Upgrades
Condensing Unit Replacement

ULYSSES BYAS ELEMENTARY SCHOOL **Entire Building**

Amb. Temp Bin [°F]	Avgerage Temp. [°F]	01-08 Hours	09-16 Hours	17-24 Hours	Total Bin Hours	Occ.Bin Hours	Unocc. Bin Hours	Occ. Load [Tons]	Unocc. Load [Tons]	Occ. Consumption [Ton-Hrs]	Unocc. Consumption [Ton-Hrs]	Existing Total Consumption [kWh]	Proposed Total Consumption [kWh]	Total Electrical Savings [kWh]
COOLING														
100 to 105	102.5	-	-	-	-	-	-	325.0	325.0	-	-	-	-	-
95 to 100	97.5	-	3	-	3	2	1	325.0	325.0	696	279	975	900	75
90 to 95	92.5	-	18	3	21	13	8	325.0	325.0	4,179	2,646	6,825	6,300	525
85 to 90	87.5	-	100	18	118	71	47	226.5	108.3	16,180	5,045	21,225	19,592	1,633
80 to 85	82.5	37	292	126	455	215	240	128.0	-	27,549	-	27,549	25,430	2,119
75 to 80	77.5	189	289	247	725	240	485	29.5	-	7,096	-	7,096	6,550	546
70 to 75	72.5	275	200	270	745	192	553	-	-	-	-	-	-	-
65 to 70	67.5	236	184	245	665	174	491	-	-	-	-	-	-	-
60 to 65	62.5	232	158	196	586	154	432	-	-	-	-	-	-	-
Total		969	1,244	1,105	3,318	1,062	2,256					63,670	58,773	4,898

Roosevelt UFSD, NY
Exhibit D-5-4
ECM 4 - Mechanical Upgrades
Condensing Unit Replacement

SAVINGS SUMMARY

Building ID	kWh Savings	Electric Safety Factor
	kWh	%
Centennial Avenue Elementary School	-	5.0%
Washington-Rose Elementary School	-	0.0%
Ulysses Byas Elementary School	4,898	0.0%
Roosevelt Middle School	-	0.0%
Roosevelt High School	-	0.0%
Subtotal	4,898	

Roosevelt UFSD, NY
Exhibit D-5-4
ECM 4 - Mechanical Upgrades
Condensing Unit Replacement

ECM DESCRIPTION

Replace existing low efficiency condensing units in respective buildings with new high efficiency condensing units with an EER of 12+

DATA / ASSUMPTIONS

Run Hours based on occupancy schedule
Full Load Design Temperature [°F] = 92.5

COMMISSIONING

Start up equipment ensure proper operation

RECOVERY/SAFETY FACTOR

Electric Safety Factor [%] = 10%

FORMULAE

REPLACEMENT

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

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

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

Variable	Units	Description
$W_{SAVINGS}$	kWh	Electrical Savings
$W_{C\text{-}EXT}$	kWh	Existing condensing unit Consumption
$W_{C\text{-}PRP}$	kWh	Proposed condensing unit Consumption
$\sum_{60}^{105}$	-	Summation of all bins from 60°F to 105°F
C	Ton	Tonnage of condensing unit
η_{EXT}	-	Existing efficiency of condensing unit (EER)
η_{PRP}	-	Proposed efficiency of condensing unit (EER)
T_{DESIGN}	°F	Design Temperature of condensing unit (Usually 92.5°F)
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

* Inputs are in blue

Building	Label	Capacity [Tons]	Current EER	Proposed EER	Area Serving
Centennial Avenue Elementary School	IT Closet	6.0	10.0	13.0	IT Closet
Roosevelt Middle School	IT Closet	4.0	10.0	13.0	IT Closet
Totals		**10.0**			

CALCULATIONS

	Centennial Avenue Elementary School	Roosevelt Middle School
Label	IT Closet	IT Closet
Area Serving	IT Closet	IT Closet
Condensing Unit Capacity [Tons]	6.0	4.0
Current EER	10.0	10.0
Proposed EER	13.0	13.0
Proposed Occ. Cooling Setpoint [°F]	76.0	76.0
Proposed Unocc. Cooling Setpoint [°F]	76.0	76.0
Current Condensing Unit Consumption [kWh]	2,530	1,687
Proposed Condensing Unit Consumption [kWh]	1,946	1,297
Electric Safety Factor [%]	5%	5%
Electrical Savings [kWh]	555	370

Roosevelt UFSD, NY
Exhibit D-5-4
ECM 4 - Mechanical Upgrades
Condensing Unit Replacement

CENTENNIAL AVENUE ELEMENTARY SCHOOL

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	Current Condensing Unit Consumption	Proposed Condensing Unit Consumption	Savings
COOLING												kWh	kWh	kWh
100 to 105	102.5	-	-	-	-	-	-	6.0	6.0	-	-	-	-	-
95 to 100	97.5	-	3	-	3	2	1	6.0	6.0	13	5	22	17	5
90 to 95	92.5	-	18	3	21	13	8	6.0	6.0	77	49	151	116	35
85 to 90	87.5	-	100	18	118	71	47	4.2	4.2	299	195	592	455	137
80 to 85	82.5	37	292	126	455	215	240	2.4	2.4	509	567	1,291	993	298
75 to 80	77.5	189	289	247	725	240	485	0.5	0.5	131	264	475	365	110
70 to 75	72.5	275	200	270	745	192	553	-	-	-	-	-	-	-
65 to 70	67.5	236	184	245	665	174	491	-	-	-	-	-	-	-
60 to 65	62.5	232	158	196	586	154	432	-	-	-	-	-	-	-
Total		969	1,244	1,105	3,318	1,062	2,256	19.1	19.1	1,028	1,080	2,530	1,946	584

ROOSEVELT MIDDLE SCHOOL

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	Current Condensing Unit Consumption	Proposed Condensing Unit Consumption	Savings
COOLING												kWh	kWh	kWh
100 to 105	102.5	-	-	-	-	-	-	4.0	4.0	-	-	-	-	-
95 to 100	97.5	-	3	-	3	2	1	4.0	4.0	9	3	14	11	3
90 to 95	92.5	-	18	3	21	13	8	4.0	4.0	54	30	101	78	23
85 to 90	87.5	-	100	18	118	75	43	2.8	2.8	208	121	395	304	91
80 to 85	82.5	37	292	126	455	238	217	1.6	1.6	375	342	860	662	199
75 to 80	77.5	189	289	247	725	284	441	0.4	0.4	103	160	316	243	73
70 to 75	72.5	275	200	270	745	240	505	-	-	-	-	-	-	-
65 to 70	67.5	236	184	245	665	217	448	-	-	-	-	-	-	-
60 to 65	62.5	232	158	196	586	189	397	-	-	-	-	-	-	-
Total		969	1,244	1,105	3,318	1,259	2,059	12.7	12.7	748	657	1,687	1,297	389

Roosevelt UFSD, NY
Exhibit D-5-4
ECM 4 - Mechanical Upgrades
Condensing Unit Replacement

SAVINGS SUMMARY

Building ID	kWh Savings	Electric Safety Factor
	kWh	%
Centennial Avenue Elementary School	555	5.0%
Washington-Rose Elementary School	-	0.0%
Ulysses Byas Elementary School	-	0.0%
Roosevelt Middle School	370	5.0%
Roosevelt High School	-	0.0%
Subtotal	924	

Roosevelt UFSD, NY
Exhibit D-5-5
ECM 5 - Install De-Stratification Fans

ECM DESCRIPTION

Install de-stratification fans in large open areas to force heated air down to the occupied space and reduce heat loss through the roof and upper walls.

DATA / ASSUMPTIONS

Heating Season Hours 4,016 Hours

*Diversity factor set at 95%

COMMISSIONING

Verify that the installed fans operate. Install clock meter on fans to verify that fans are running 24/7 during heating season

RECOVERY/SAFETY FACTOR

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

The thermal safety factor is conservatively set for 0% due to the uncertainty with temperature changes along the elevation of the space, the electric safety factor is set 0% due to the penalty that is taken for adding fan power.

FORMULA

$W_{TOTAL} = W_{FAN} \cdot q \cdot t_{FAN}$

$Q_{SAVINGS} = Q_{TOTAL} \cdot \mu / 100{,}000 / \eta_{Boiler}$

$Q_{TOTAL} = Q_{WALL} + Q_{ROOF} + Q_{WIN}$

$Q_{WALL} = \sum_{-15}^{60} [((T_{OCC} - T_{BIN}) \cdot A_{WALL} \cdot U_{WALL} \cdot t_{OCC}) + ((T_{UNOCC} - T_{BIN}) \cdot A_{WALL} \cdot U_{WALL} \cdot t_{UNOCC})]$

$Q_{WIN} = \sum_{-15}^{60} [((T_{OCC} - T_{BIN}) \cdot A_{WIN} \cdot U_{WIN} \cdot t_{OCC}) + ((T_{UNOCC} - T_{BIN}) \cdot A_{WIN} \cdot U_{WIN} \cdot t_{UNOCC})]$

$Q_{ROOF} = \sum_{-15}^{60} [((T_{OCC} - T_{BIN}) \cdot A_{ROOF} \cdot U_{ROOF} \cdot t_{OCC}) + ((T_{UNOCC} - T_{BIN}) \cdot A_{ROOF} \cdot U_{ROOF} \cdot t_{UNOCC})]$

Roosevelt UFSD, NY
Exhibit D-5-5
ECM 5 - Install De-Stratification Fans

Variable	Units	Description
$Q_{SAVINGS}$	Therms	Annual thermal savings
$\sum_{-15}^{60}$	-	Summation of all bins from -15°F to 60°F
η_{Boiler}	%	Boiler Efficiency
μ	%	Diversity factor of de-stratification fans
Q_{TOTAL}	BTU	Total heat loss
Q_{WALL}	BTU	Heat loss through wall (above de-stratification fan)
Q_{ROOF}	BTU	Heat loss through roof
Q_{WIN}	BTU	Heat loss through windows (above de-stratification fan)
T_{BIN}	°F	Temperature of respective bin
T_{OCC}	°F	Existing temperature of space during occupied hours
T_{UNOCC}	°F	Existing temperature of space during unoccupied hours
t_{OCC}	Hrs	Occupied Bin Hours in respective temperature bin
t_{UNOCC}	Hrs	Unoccupied Bin Hours in respective temperature bin
A_{WALL}	ft^2	Exposed wall area adove de-stratification fan
A_{ROOF}	ft^2	Exposed roof area adove de-stratification fan
A_{WINDOW}	ft^2	Exposed window area adove de-stratification fan
U_{WALL}	BTU / ft^2 / °F	U-factor of wall
U_{ROOF}	BTU / ft^2 / °F	U-factor of roof
U_{WIN}	BTU / ft^2 / °F	U-factor of windows
W_{TOTAL}	kWh	Annual electrical consumption of fans
q	-	Quantity of fans
W_{FAN}	kW	Input kW of fan
t_{FAN}	Hrs	Annual run time of de-stratification fan (annual heating hours)

ASSUMPTIONS / DATA

* Inputs are in blue

Building	Location	Wall Length Perimeter [ft]	Wall Width Perimeter [ft]	Exposed Wall Height Above Fan [ft]	Roof Area [ft^2]	Window Area [ft^2 - Above Fan]	Roof U-Factor [BTU/ft^2-°F·hr]	Window U-Factor [BTU/ft^2-°F·hr]	Wall U-Factor [BTU/ft^2-°F·hr]	Proposed Boiler Efficiency [%]
Centennial Avenue Elementary School	Main Gym	78	52	6.0	4,056	-	0.08	0.67	0.11	79.0%
Washington-Rose Elementary School	Gym	76	50	6.0	3,800	252	0.08	0.67	0.11	89.0%
Ulysses Byas Elementary School	Gym	75	51	6.0	3,825	-	0.08	0.67	0.11	81.0%
Roosevelt Middle School	Gym	100	62	6.0	6,200	324	0.08	0.67	0.11	89.0%
Roosevelt High School	Gym	106	86	6.0	9,116	32	0.08	0.67	0.11	89.0%
Roosevelt High School	Aux Gym	95	60	6.0	5,700	120	0.08	0.67	0.11	89.0%
Totals										

Roosevelt UFSD, NY
Exhibit D-5-5
ECM 5 - Install De-Stratification Fans

CALCULATIONS

	Centennial Avenue Elementary School	Washington-Rose Elementary School	Ulysses Byas Elementary School	Roosevelt Middle School	Roosevelt High School	Roosevelt High School
Location	Main Gym	Gym	Gym	Gym	Gym	Aux Gym
Wall Length [ft]	78	76	75	100	106	95
Wall Width [ft]	52	50	51	62	86	60
Wall Height Above Fan [ft]	6.0	6.0	6.0	6.0	6.0	6.0
Roof Area [ft^2]	4,056	3,800	3,825	6,200	9,116	5,700
Window Area [ft^2]	-	252	-	324	32	120
Wall Exposed Area [ft^2]	1,560	1,260	1,512	1,620	2,272	1,740
Roof U-Factor [BTU/ft^2·°F·hr]	0.08	0.08	0.08	0.08	0.08	0.08
Window U-Factor [BTU/ft^2·°F·hr]	0.67	0.67	0.67	0.67	0.67	0.67
Wall U-Factor [BTU/ft^2·°F·hr]	0.11	0.11	0.11	0.11	0.11	0.11
Fan Model	Air Pear 25	Air Pear 25	Air Pear 25	Air Pear 25	Air Pear 25	Air Pear 25
Total Run Hours [hrs]	4,016	4,016	4,016	4,016	4,016	4,016
Fan Input Watts [W]	31.3	31.3	31.3	31.3	31.3	31.3
Fan Electrical Consumption [kWh]	126	126	126	126	126	126
Area Coverage per Fan [ft^2]	1,200	1,200	1,200	1,200	1,200	1,200
Total Fans	4	4	4	6	8	5
Total Fan Electrical Consumption [kWh]	503	503	503	754	1,006	629
Proposed Occ. Heating Setpoint [°F]	68.0	68.0	68.0	68.0	68.0	68.0
Proposed Unocc. Heating Setpoint [°F]	55.0	55.0	55.0	55.0	55.0	55.0
Diversity Factor [%]	95%	95%	95%	95%	95%	95%
Proposed Boiler Efficiency [%]	79.0%	89.0%	81.0%	89.0%	89.0%	89.0%
Fan Electric Penalty [kWh]	(503)	(503)	(503)	(754)	(1,006)	(629)
Calculated Fuel Savings [Therms]	451	497	419	753	843	649
Electric Safety Factor [%]	0%	0%	0%	0%	0%	0%
Thermal Safety Factor [%]	0%	0%	0%	0%	0%	0%
Additional Electric Usage [kWh]	(503)	(503)	(503)	(754)	(1,006)	(629)
Calculated Fuel Savings [Therms]	451	497	419	753	843	649

Roosevelt UFSD, NY
Exhibit D-5-5
ECM 5 - Install De-Stratification Fans

CENTENNIAL AVENUE ELEMENTARY SCHOOL **Main Gym**

Amb. Temp Bin [°F]	Ave Temp [°F]	01-08 Hours	09-16 Hours	17-24 Hours	Total Bin Hours	Occupied Bin Hours	Unoccupied Bin Hours	Exposed Wall Area [ft^2]	Exposed Roof Area [ft^2]	Window Area [ft^2]	Wall U-Factor [BTU/ft^2·°F·hr]	Roof U-Factor [BTU/ft^2·°F·hr]	Window U-Factor [BTU/ft^2·°F·hr]	Wall Heat Loss [BTU/Yr]	Roof Heat Loss [BTU/Yr]	Windows Heat Loss [BTU/Yr]	Total Heat Loss [BTU/Yr]
HEATING																	
55 to 60	57.5	60	127	96	283	101	182	1,560	4,056	-	0.11	0.08	0.67	100,094	195,802	-	295,895
50 to 55	52.5	110	178	125	413	147	266	1,560	4,056	-	0.11	0.08	0.67	481,689	942,275	-	1,423,964
45 to 50	47.5	108	164	121	393	136	257	1,560	4,056	-	0.11	0.08	0.67	773,312	1,512,745	-	2,286,056
40 to 45	42.5	240	251	280	771	222	549	1,560	4,056	-	0.11	0.08	0.67	2,051,654	4,013,425	-	6,065,079
35 to 40	37.5	355	282	362	999	265	734	1,560	4,056	-	0.11	0.08	0.67	3,427,544	6,704,929	-	10,132,474
30 to 35	32.5	239	120	167	526	128	398	1,560	4,056	-	0.11	0.08	0.67	2,211,973	4,327,040	-	6,539,013
25 to 30	27.5	109	76	81	266	74	192	1,560	4,056	-	0.11	0.08	0.67	1,355,240	2,651,108	-	4,006,348
20 to 25	22.5	100	51	72	223	54	169	1,560	4,056	-	0.11	0.08	0.67	1,302,737	2,548,401	-	3,851,137
15 to 20	17.5	58	29	25	112	31	81	1,560	4,056	-	0.11	0.08	0.67	754,124	1,475,209	-	2,229,333
10 to 15	12.5	10	5	6	21	5	16	1,560	4,056	-	0.11	0.08	0.67	157,599	308,294	-	465,893
5 to 10	7.5	8	-	1	9	1	8	1,560	4,056	-	0.11	0.08	0.67	73,066	142,932	-	215,998
0 to 5	2.5	-	-	-	-	-	-	1,560	4,056	-	0.11	0.08	0.67	-	-	-	-
-5 to 0	-2.5	-	-	-	-	-	-	1,560	4,056	-	0.11	0.08	0.67	-	-	-	-
-10 to -5	-7.5	-	-	-	-	-	-	1,560	4,056	-	0.11	0.08	0.67	-	-	-	-
-15 to -10	-12.5	-	-	-	-	-	-	1,560	4,056	-	0.11	0.08	0.67	-	-	-	-
Total		1,397	1,283	1,336	4,016	1,166	2,850							12,689,030	24,822,160	-	37,511,190

WASHINGTON-ROSE ELEMENTARY SCHOOL **Gym**

Amb. Temp Bin [°F]	Ave Temp [°F]	01-08 Hours	09-16 Hours	17-24 Hours	Total Bin Hours	Occupied Bin Hours	Unoccupied Bin Hours	Exposed Wall Area [ft^2]	Exposed Roof Area [ft^2]	Window Area [ft2]	Wall U-Factor [BTU/ft^2·°F·hr]	Roof U-Factor [BTU/ft^2·°F·hr]	Window U-Factor [BTU/ft^2·°F·hr]	Wall Heat Loss [BTU/Yr]	Roof Heat Loss [BTU/Yr]	Windows Heat Loss [BTU/Yr]	Total Heat Loss [BTU/Yr]
HEATING																	
55 to 60	57.5	60	127	96	283	101	182	1,260	3,800	252	0.11	0.08	0.67	80,845	183,444	102,711	367,000
50 to 55	52.5	110	178	125	413	147	266	1,260	3,800	252	0.11	0.08	0.67	389,057	882,802	494,287	1,766,146
45 to 50	47.5	108	164	121	393	136	257	1,260	3,800	252	0.11	0.08	0.67	624,598	1,417,266	793,537	2,835,400
40 to 45	42.5	240	251	280	771	222	549	1,260	3,800	252	0.11	0.08	0.67	1,657,105	3,760,112	2,105,312	7,522,529
35 to 40	37.5	355	282	362	999	265	734	1,260	3,800	252	0.11	0.08	0.67	2,768,401	6,281,739	3,517,188	12,567,327
30 to 35	32.5	239	120	167	526	128	398	1,260	3,800	252	0.11	0.08	0.67	1,786,593	4,053,933	2,269,824	8,110,351
25 to 30	27.5	109	76	81	266	74	192	1,260	3,800	252	0.11	0.08	0.67	1,094,617	2,483,780	1,390,685	4,969,082
20 to 25	22.5	100	51	72	223	54	169	1,260	3,800	252	0.11	0.08	0.67	1,052,210	2,387,555	1,336,808	4,776,573
15 to 20	17.5	58	29	25	112	31	81	1,260	3,800	252	0.11	0.08	0.67	609,100	1,382,099	773,847	2,765,046
10 to 15	12.5	10	5	6	21	5	16	1,260	3,800	252	0.11	0.08	0.67	127,292	288,835	161,721	577,848
5 to 10	7.5	8	-	1	9	1	8	1,260	3,800	252	0.11	0.08	0.67	59,015	133,911	74,977	267,903
0 to 5	2.5	-	-	-	-	-	-	1,260	3,800	252	0.11	0.08	0.67	-	-	-	-
-5 to 0	-2.5	-	-	-	-	-	-	1,260	3,800	252	0.11	0.08	0.67	-	-	-	-
-10 to -5	-7.5	-	-	-	-	-	-	1,260	3,800	252	0.11	0.08	0.67	-	-	-	-
-15 to -10	-12.5	-	-	-	-	-	-	1,260	3,800	252	0.11	0.08	0.67	-	-	-	-
Total		1,397	1,283	1,336	4,016	1,166	2,850							10,248,832	23,255,475	13,020,897	46,525,205

Roosevelt UFSD, NY
Exhibit D-5-5
ECM 5 - Install De-Stratification Fans

ULYSSES BYAS ELEMENTARY SCHOOL **Gym**

Amb. Temp Bin [°F]	Ave Temp [°F]	01-08 Hours	09-16 Hours	17-24 Hours	Total Bin Hours	Occupied Bin Hours	Unoccupied Bin Hours	Exposed Wall Area [ft^2]	Exposed Roof Area [ft^2]	Window Area [ft2]	Wall U-Factor [BTU/ft^2·°F·hr]	Roof U-Factor [BTU/ft^2·°F·hr]	Window U-Factor [BTU/ft^2·°F·hr]	Wall Heat Loss [BTU/Yr]	Roof Heat Loss [BTU/Yr]	Windows Heat Loss [BTU/Yr]	Total Heat Loss [BTU/Yr]
HEATING																	
55 to 60	57.5	60	127	96	283	101	182	1,512	3,825	-	0.11	0.08	0.67	97,014	184,651	-	281,664
50 to 55	52.5	110	178	125	413	147	266	1,512	3,825	-	0.11	0.08	0.67	466,868	888,610	-	1,355,478
45 to 50	47.5	108	164	121	393	136	257	1,512	3,825	-	0.11	0.08	0.67	749,517	1,426,590	-	2,176,107
40 to 45	42.5	240	251	280	771	222	549	1,512	3,825	-	0.11	0.08	0.67	1,988,526	3,784,850	-	5,773,375
35 to 40	37.5	355	282	362	999	265	734	1,512	3,825	-	0.11	0.08	0.67	3,322,081	6,323,066	-	9,645,147
30 to 35	32.5	239	120	167	526	128	398	1,512	3,825	-	0.11	0.08	0.67	2,143,912	4,080,604	-	6,224,516
25 to 30	27.5	109	76	81	266	74	192	1,512	3,825	-	0.11	0.08	0.67	1,313,541	2,500,120	-	3,813,661
20 to 25	22.5	100	51	72	223	54	169	1,512	3,825	-	0.11	0.08	0.67	1,262,652	2,403,263	-	3,665,915
15 to 20	17.5	58	29	25	112	31	81	1,512	3,825	-	0.11	0.08	0.67	730,920	1,391,192	-	2,122,112
10 to 15	12.5	10	5	6	21	5	16	1,512	3,825	-	0.11	0.08	0.67	152,750	290,736	-	443,485
5 to 10	7.5	8	-	1	9	1	8	1,512	3,825	-	0.11	0.08	0.67	70,818	134,792	-	205,610
0 to 5	2.5	-	-	-	-	-	-	1,512	3,825	-	0.11	0.08	0.67	-	-	-	-
-5 to 0	-2.5	-	-	-	-	-	-	1,512	3,825	-	0.11	0.08	0.67	-	-	-	-
-10 to -5	-7.5	-	-	-	-	-	-	1,512	3,825	-	0.11	0.08	0.67	-	-	-	-
-15 to -10	-12.5	-	-	-	-	-	-	1,512	3,825	-	0.11	0.08	0.67	-	-	-	-
Total		1,397	1,283	1,336	4,016	1,166	2,850							12,298,599	23,408,472	-	35,707,071

ROOSEVELT MIDDLE SCHOOL **Gym**

Amb. Temp Bin [°F]	Ave Temp [°F]	01-08 Hours	09-16 Hours	17-24 Hours	Total Bin Hours	Occupied Bin Hours	Unoccupied Bin Hours	Exposed Wall Area [ft^2]	Exposed Roof Area [ft^2]	Window Area [ft2]	Wall U-Factor [BTU/ft^2·°F·hr]	Roof U-Factor [BTU/ft^2·°F·hr]	Window U-Factor [BTU/ft^2·°F·hr]	Wall Heat Loss [BTU/Yr]	Roof Heat Loss [BTU/Yr]	Windows Heat Loss [BTU/Yr]	Total Heat Loss [BTU/Yr]
HEATING																	
55 to 60	57.5	60	127	96	283	119	164	1,620	6,200	324	0.11	0.08	0.67	141,851	408,458	180,219	730,528
50 to 55	52.5	110	178	125	413	169	244	1,620	6,200	324	0.11	0.08	0.67	549,575	1,582,491	698,222	2,830,288
45 to 50	47.5	108	164	121	393	158	235	1,620	6,200	324	0.11	0.08	0.67	850,834	2,449,962	1,080,964	4,381,761
40 to 45	42.5	240	251	280	771	272	499	1,620	6,200	324	0.11	0.08	0.67	2,241,128	6,453,290	2,847,300	11,541,718
35 to 40	37.5	355	282	362	999	329	670	1,620	6,200	324	0.11	0.08	0.67	3,702,318	10,660,759	4,703,706	19,066,783
30 to 35	32.5	239	120	167	526	158	368	1,620	6,200	324	0.11	0.08	0.67	2,362,993	6,804,197	3,002,126	12,169,315
25 to 30	27.5	109	76	81	266	88	178	1,620	6,200	324	0.11	0.08	0.67	1,439,350	4,144,583	1,828,660	7,412,592
20 to 25	22.5	100	51	72	223	67	156	1,620	6,200	324	0.11	0.08	0.67	1,381,273	3,977,351	1,754,874	7,113,498
15 to 20	17.5	58	29	25	112	36	76	1,620	6,200	324	0.11	0.08	0.67	793,000	2,283,430	1,007,488	4,083,918
10 to 15	12.5	10	5	6	21	6	15	1,620	6,200	324	0.11	0.08	0.67	166,030	478,080	210,937	855,046
5 to 10	7.5	8	-	1	9	2	7	1,620	6,200	324	0.11	0.08	0.67	76,272	219,623	96,901	392,796
0 to 5	2.5	-	-	-	-	-	-	1,620	6,200	324	0.11	0.08	0.67	-	-	-	-
-5 to 0	-2.5	-	-	-	-	-	-	1,620	6,200	324	0.11	0.08	0.67	-	-	-	-
-10 to -5	-7.5	-	-	-	-	-	-	1,620	6,200	324	0.11	0.08	0.67	-	-	-	-
-15 to -10	-12.5	-	-	-	-	-	-	1,620	6,200	324	0.11	0.08	0.67	-	-	-	-
Total		1,397	1,283	1,336	4,016	1,404	2,612							13,704,623	39,462,224	17,411,397	70,578,244

Roosevelt UFSD, NY
Exhibit D-5-5
ECM 5 - Install De-Stratification Fans

ROOSEVELT HIGH SCHOOL **Gym**

Amb. Temp Bin [°F]	Ave Temp [°F]	01-08 Hours	09-16 Hours	17-24 Hours	Total Bin Hours	Occupied Bin Hours	Unoccupied Bin Hours	Exposed Wall Area [ft^2]	Exposed Roof Area [ft^2]	Window Area [ft2]	Wall U-Factor [BTU/ft^2·°F·hr]	Roof U-Factor [BTU/ft^2·°F·hr]	Window U-Factor [BTU/ft^2·°F·hr]	Wall Heat Loss [BTU/Yr]	Roof Heat Loss [BTU/Yr]	Windows Heat Loss [BTU/Yr]	Total Heat Loss [BTU/Yr]
HEATING																	
55 to 60	57.5	60	127	96	283	119	164	2,272	9,116	32	0.11	0.08	0.67	198,942	600,565	17,799	817,307
50 to 55	52.5	110	178	125	413	169	244	2,272	9,116	32	0.11	0.08	0.67	770,762	2,326,773	68,960	3,166,495
45 to 50	47.5	108	164	121	393	158	235	2,272	9,116	32	0.11	0.08	0.67	1,193,269	3,602,235	106,762	4,902,265
40 to 45	42.5	240	251	280	771	272	499	2,272	9,116	32	0.11	0.08	0.67	3,143,113	9,488,418	281,215	12,912,746
35 to 40	37.5	355	282	362	999	329	670	2,272	9,116	32	0.11	0.08	0.67	5,192,386	15,674,755	464,564	21,331,705
30 to 35	32.5	239	120	167	526	158	368	2,272	9,116	32	0.11	0.08	0.67	3,314,024	10,004,364	296,506	13,614,895
25 to 30	27.5	109	76	81	266	88	178	2,272	9,116	32	0.11	0.08	0.67	2,018,644	6,093,873	180,608	8,293,125
20 to 25	22.5	100	51	72	223	67	156	2,272	9,116	32	0.11	0.08	0.67	1,937,192	5,847,989	173,321	7,958,502
15 to 20	17.5	58	29	25	112	36	76	2,272	9,116	32	0.11	0.08	0.67	1,112,158	3,357,379	99,505	4,569,042
10 to 15	12.5	10	5	6	21	6	15	2,272	9,116	32	0.11	0.08	0.67	232,852	702,932	20,833	956,616
5 to 10	7.5	8	-	1	9	2	7	2,272	9,116	32	0.11	0.08	0.67	106,969	322,916	9,570	439,455
0 to 5	2.5	-	-	-	-	-	-	2,272	9,116	32	0.11	0.08	0.67	-	-	-	-
-5 to 0	-2.5	-	-	-	-	-	-	2,272	9,116	32	0.11	0.08	0.67	-	-	-	-
-10 to -5	-7.5	-	-	-	-	-	-	2,272	9,116	32	0.11	0.08	0.67	-	-	-	-
-15 to -10	-12.5	-	-	-	-	-	-	2,272	9,116	32	0.11	0.08	0.67	-	-	-	-
Total		1,397	1,283	1,336	4,016	1,404	2,612							19,220,311	58,022,199	1,719,644	78,962,154

ROOSEVELT HIGH SCHOOL **Aux Gym**

Amb. Temp Bin [°F]	Ave Temp [°F]	01-08 Hours	09-16 Hours	17-24 Hours	Total Bin Hours	Occupied Bin Hours	Unoccupied Bin Hours	Exposed Wall Area [ft2]	Exposed Roof Area [ft2]	Window Area [ft2]	Wall U-Factor [BTU/ft2·°F·hr]	Roof U-Factor [BTU/ft2·°F·hr]	Window U-Factor [BTU/ft2·°F·hr]	Wall Heat Loss [BTU/Yr]	Roof Heat Loss [BTU/Yr]	Windows Heat Loss [BTU/Yr]	Total Heat Loss [BTU/Yr]
HEATING																	
55 to 60	57.5	60	127	96	283	144	139	1,740	5,700	120	0.11	0.08	0.67	213,433	526,047	93,504	832,984
50 to 55	52.5	110	178	125	413	203	210	1,740	5,700	120	0.11	0.08	0.67	669,808	1,650,872	293,440	2,614,119
45 to 50	47.5	108	164	121	393	190	203	1,740	5,700	120	0.11	0.08	0.67	990,838	2,442,114	434,081	3,867,032
40 to 45	42.5	240	251	280	771	347	424	1,740	5,700	120	0.11	0.08	0.67	2,585,270	6,371,906	1,132,595	10,089,771
35 to 40	37.5	355	282	362	999	426	573	1,740	5,700	120	0.11	0.08	0.67	4,206,863	10,368,640	1,843,007	16,418,510
30 to 35	32.5	239	120	167	526	203	323	1,740	5,700	120	0.11	0.08	0.67	2,644,273	6,517,329	1,158,443	10,320,044
25 to 30	27.5	109	76	81	266	110	156	1,740	5,700	120	0.11	0.08	0.67	1,597,499	3,937,351	699,857	6,234,707
20 to 25	22.5	100	51	72	223	86	137	1,740	5,700	120	0.11	0.08	0.67	1,529,395	3,769,493	670,021	5,968,909
15 to 20	17.5	58	29	25	112	42	70	1,740	5,700	120	0.11	0.08	0.67	867,646	2,138,483	380,111	3,386,240
10 to 15	12.5	10	5	6	21	8	13	1,740	5,700	120	0.11	0.08	0.67	182,145	448,933	79,797	710,875
5 to 10	7.5	8	-	1	9	2	7	1,740	5,700	120	0.11	0.08	0.67	82,558	203,479	36,168	322,205
0 to 5	2.5	-	-	-	-	-	-	1,740	5,700	120	0.11	0.08	0.67	-	-	-	-
-5 to 0	-2.5	-	-	-	-	-	-	1,740	5,700	120	0.11	0.08	0.67	-	-	-	-
-10 to -5	-7.5	-	-	-	-	-	-	1,740	5,700	120	0.11	0.08	0.67	-	-	-	-
-15 to -10	-12.5	-	-	-	-	-	-	1,740	5,700	120	0.11	0.08	0.67	-	-	-	-
Total		1,397	1,283	1,336	4,016	1,762	2,254							15,569,727	38,374,646	6,821,023	60,765,396

Roosevelt UFSD, NY
Exhibit D-5-5
ECM 5 - Install De-Stratification Fans

SAVINGS SUMMARY

Building ID	kWh Savings	Thermal Savings	Electric Safety Factor	Thermal Safety Factor
	kWh	Therms	%	%
Centennial Avenue Elementary School	(503)	451	0.0%	0.0%
Washington-Rose Elementary School	(503)	497	0.0%	0.0%
Ulysses Byas Elementary School	(503)	419	0.0%	0.0%
Roosevelt Middle School	(754)	753	0.0%	0.0%
Roosevelt High School	(1,634)	1,491	0.0%	0.0%
Subtotal	(3,897)	3,611		

Roosevelt UFSD, NY
Exhibit D-5-6
ECM 6 - Building Management System Upgrades

ECM DESCRIPTION

The building management system will be upgraded to allow for the implementation of advanced control strategies.

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

	EXISTING									
	Section 1					Section 2				
Building	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]
Centennial Avenue Elementary School	100%	71.0	60.0	72.0	80.0					
Washington-Rose Elementary School	100%	71.0	60.0	74.0	80.0					
Ulysses Byas Elementary School	100%	71.0	60.0	74.0	80.0					
Roosevelt Middle School	100%	72.0	60.0	74.0	80.0					
Roosevelt High School	100%	71.0	60.0	73.0	80.0					

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	76.0	85.0				
68.0	55.0	76.0	85.0				
68.0	55.0	76.0	85.0				
68.0	55.0	76.0	85.0				
68.0	55.0	76.0	85.0				

Roosevelt UFSD, NY
Exhibit D-5-6
ECM 6 - Building Management System Upgrades

THERMAL NIGHT SETBACK SAVINGS CALCULATIONS

	Centennial Avenue Elementary School	Washington-Rose Elementary School	Ulysses Byas Elementary School	Roosevelt Middle School	Roosevelt High School
Occupied Bin Hours	1,884	4,016	1,586	2,494	1,762
Occupied Heating Degree Hours [HD-Hrs]	57,952	126,566	48,632	80,281	53,985
Annual Boiler Usage [Therms]	31,989	50,985	51,856	75,060	87,073
Adjusted Annual Boiler Usage [Therms]	29,719	48,842	51,100	70,391	77,243
Existing Heating Degree Hours [HD-Hrs]	103,118	126,566	99,837	112,322	101,776
Proposed Heating Degree Hours [HD-Hrs]	77,921	77,921	77,921	80,979	80,979
Thermal Safety Factor [%]	5%	30%	5%	5%	5%
Thermal Savings [%]	23.2%	26.9%	20.9%	26.5%	19.4%
Thermal Savings [Therms]	6,899	13,141	10,657	18,660	14,994

ELECTRIC NIGHT SETBACK SAVINGS CALCULATIONS

Annual Electric Usage [kWh]	1,051,200	1,139,200	861,920	2,495,040	2,037,280
Annual Cooling Electric Baseline [kWh]	149,040	267,886	38,240	361,440	176,240
Existing Cooling Degree Hours [CD-Hrs]	7,544	8,457	5,495	6,472	6,485
Proposed Cooling Degree Hours [CD-Hrs]	3,027	3,027	3,027	3,273	3,273
Electric Normalization Factor [%]	15%	15%	15%	15%	15%
Electric Safety Factor [%]	5%	10%	0%	0%	0%
Electrical Savings [%]	48.4%	49.1%	38.2%	42.0%	42.1%
Electrical Savings [kWh]	72,063	131,587	14,600	151,856	74,200

EXHAUST FAN SCHEDULE SAVINGS CALCULATIONS

Total Exhaust Fan Power Controlled [kW]	-	-	-	0.4	-
Existing Exhaust Fan Run Hours [hrs]	7,334	7,334	7,334	7,334	7,334
Proposed Exhaust Fan Run Hours [hrs]	2,228	2,228	2,228	2,663	2,663
Electric Safety Factor [%]	5%	10%	0%	0%	0%
Electrical Savings [kWh]	-	-	-	1,741	-

Roosevelt UFSD, NY
Exhibit D-5-6
ECM 6 - Building Management System Upgrades

CENTENNIAL AVENUE ELEMENTARY SCHOOL

						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	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	-	-	-	-	-	-	72.0	80.0	-	-	-	-	-	-	-	-	-	-	-	76.0	85.0	-	-	-
95 to 100	97.5	-	3	-	3	2	1	72.0	80.0	55	15	70	-	-	-	-	-	70	2	1	76.0	85.0	46	11	57
90 to 95	92.5	-	18	3	21	14	7	72.0	80.0	294	83	377	-	-	-	-	-	377	13	8	76.0	85.0	212	61	273
85 to 90	87.5	-	100	18	118	80	38	72.0	80.0	1,244	283	1,527	-	-	-	-	-	1,527	71	47	76.0	85.0	821	116	938
80 to 85	82.5	37	292	126	455	279	176	72.0	80.0	2,926	441	3,367	-	-	-	-	-	3,367	215	240	76.0	85.0	1,399	-	1,399
75 to 80	77.5	189	289	247	725	370	355	72.0	80.0	2,035	-	2,035	-	-	-	-	-	2,035	240	485	76.0	85.0	360	-	360
70 to 75	72.5	275	200	270	745	337	408	72.0	80.0	168	-	168	-	-	-	-	-	168	192	553	76.0	85.0	-	-	-
65 to 70	67.5	236	184	245	665	304	361	72.0	80.0	-	-	-	-	-	-	-	-	-	174	491	76.0	85.0	-	-	-
60 to 65	62.5	232	158	196	586	261	325	72.0	80.0	-	-	-	-	-	-	-	-	-	154	432	76.0	85.0	-	-	-
Total		969	1,244	1,105	3,318	1,647	1,671			6,722	822	7,544			-	-	-	**7,544**	1,062	2,256			2,839	188	**3,027**
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]
						Building	Building	Section 1	Section 1	Section 1	Section 1	Section 1	Section 2	Section 2	Section 2	Section 2	Section 2	Building							
HEATING																									
55 to 60	57.5	60	127	96	283	151	132	71.0	60.0	2,042	329	2,371	-	-	-	-	-	2,371	101	182	68	55	1,065	-	1,065
50 to 55	52.5	110	178	125	413	213	200	71.0	60.0	3,942	1,499	5,441	-	-	-	-	-	5,441	147	266	68	55	2,275	666	2,941
45 to 50	47.5	108	164	121	393	201	192	71.0	60.0	4,716	2,404	7,120	-	-	-	-	-	7,120	136	257	68	55	2,797	1,924	4,721
40 to 45	42.5	240	251	280	771	370	401	71.0	60.0	10,555	7,011	17,566	-	-	-	-	-	17,566	222	549	68	55	5,665	6,861	12,525
35 to 40	37.5	355	282	362	999	458	541	71.0	60.0	15,358	12,163	27,520	-	-	-	-	-	27,520	265	734	68	55	8,077	12,848	20,925
30 to 35	32.5	239	120	167	526	221	305	71.0	60.0	8,511	8,386	16,897	-	-	-	-	-	16,897	128	398	68	55	4,558	8,946	13,504
25 to 30	27.5	109	76	81	266	118	148	71.0	60.0	5,150	4,797	9,947	-	-	-	-	-	9,947	74	192	68	55	2,987	5,287	8,274
20 to 25	22.5	100	51	72	223	94	129	71.0	60.0	4,564	4,833	9,398	-	-	-	-	-	9,398	54	169	68	55	2,470	5,483	7,953
15 to 20	17.5	58	29	25	112	46	66	71.0	60.0	2,458	2,808	5,265	-	-	-	-	-	5,265	31	81	68	55	1,569	3,035	4,604
10 to 15	12.5	10	5	6	21	9	12	71.0	60.0	512	582	1,094	-	-	-	-	-	1,094	5	16	68	55	297	665	962
5 to 10	7.5	8	-	1	9	2	7	71.0	60.0	145	353	498	-	-	-	-	-	498	1	8	68	55	86	360	446
0 to 5	2.5	-	-	-	-	-	-	71.0	60.0	-	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-
-5 to 0	(2.5)	-	-	-	-	-	-	71.0	60.0	-	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-
-10 to -5	(7.5)	-	-	-	-	-	-	71.0	60.0	-	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-
-15 to -10	(12.5)	-	-	-	-	-	-	71.0	60.0	-	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-
Total		1,397	1,283	1,336	4,016	1,884	2,132			57,952	45,166	103,118			-	-	-	**103,118**	1,166	2,850			31,846	46,074	**77,921**

Roosevelt UFSD, NY
Exhibit D-5-6
ECM 6 - Building Management System Upgrades

WASHINGTON-ROSE ELEMENTARY SCHOOL

						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	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	80.0	-	-	-	-	-	-	-	-	-	-	-	76.0	85.0	-	-	-
95 to 100	97.5	-	3	-	3	3	-	74.0	80.0	71	-	71	-	-	-	-	-	71	2	1	76.0	85.0	46	11	57
90 to 95	92.5	-	18	3	21	21	0	74.0	80.0	388	0	388	-	-	-	-	-	388	13	8	76.0	85.0	212	61	273
85 to 90	87.5	-	100	18	118	118	0	74.0	80.0	1,593	0	1,593	-	-	-	-	-	1,593	71	47	76.0	85.0	821	116	938
80 to 85	82.5	37	292	126	455	455	0	74.0	80.0	3,867	0	3,867	-	-	-	-	-	3,867	215	240	76.0	85.0	1,399	-	1,399
75 to 80	77.5	189	289	247	725	725	0	74.0	80.0	2,537	-	2,537	-	-	-	-	-	2,537	240	485	76.0	85.0	360	-	360
70 to 75	72.5	275	200	270	745	745	0	74.0	80.0	-	-	-	-	-	-	-	-	-	192	553	76.0	85.0	-	-	-
65 to 70	67.5	236	184	245	665	665	0	74.0	80.0	-	-	-	-	-	-	-	-	-	174	491	76.0	85.0	-	-	-
60 to 65	62.5	232	158	196	586	586	0	74.0	80.0	-	-	-	-	-	-	-	-	-	154	432	76.0	85.0	-	-	-
Total		969	1,244	1,105	3,318	3,318	0			8,457	0	8,457			-	-	-	**8,457**	1,062	2,256			2,839	188	**3,027**
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]
						Building	Building	Section 1	Section 1	Section 1	Section 1	Section 1	Section 2	Section 2	Section 2	Section 2	Section 2	Building							
HEATING																									
55 to 60	57.5	60	127	96	283	283	0	71.0	60.0	3,820	0	3,820	-	-	-	-	-	3,820	101	182	68	55	1,065	-	1,065
50 to 55	52.5	110	178	125	413	413	0	71.0	60.0	7,640	0	7,640	-	-	-	-	-	7,640	147	266	68	55	2,275	666	2,941
45 to 50	47.5	108	164	121	393	393	0	71.0	60.0	9,235	0	9,235	-	-	-	-	-	9,235	136	257	68	55	2,797	1,924	4,721
40 to 45	42.5	240	251	280	771	771	0	71.0	60.0	21,973	0	21,973	-	-	-	-	-	21,973	222	549	68	55	5,665	6,861	12,525
35 to 40	37.5	355	282	362	999	999	0	71.0	60.0	33,466	0	33,466	-	-	-	-	-	33,466	265	734	68	55	8,077	12,848	20,925
30 to 35	32.5	239	120	167	526	526	0	71.0	60.0	20,251	0	20,251	-	-	-	-	-	20,251	128	398	68	55	4,558	8,946	13,504
25 to 30	27.5	109	76	81	266	266	0	71.0	60.0	11,571	0	11,571	-	-	-	-	-	11,571	74	192	68	55	2,987	5,287	8,274
20 to 25	22.5	100	51	72	223	223	0	71.0	60.0	10,815	0	10,815	-	-	-	-	-	10,815	54	169	68	55	2,470	5,483	7,953
15 to 20	17.5	58	29	25	112	112	0	71.0	60.0	5,992	0	5,992	-	-	-	-	-	5,992	31	81	68	55	1,569	3,035	4,604
10 to 15	12.5	10	5	6	21	21	0	71.0	60.0	1,228	0	1,228	-	-	-	-	-	1,228	5	16	68	55	297	665	962
5 to 10	7.5	8	-	1	9	9	0	71.0	60.0	571	0	571	-	-	-	-	-	571	1	8	68	55	86	360	446
0 to 5	2.5	-	-	-	-	-	-	71.0	60.0	-	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-
-5 to 0	(2.5)	-	-	-	-	-	-	71.0	60.0	-	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-
-10 to -5	(7.5)	-	-	-	-	-	-	71.0	60.0	-	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-
-15 to -10	(12.5)	-	-	-	-	-	-	71.0	60.0	-	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-
Total		1,397	1,283	1,336	4,016	4,016	0			126,566	0	126,566			-	-	-	**126,566**	1,166	2,850			31,846	46,074	**77,921**

Roosevelt UFSD, NY
Exhibit D-5-6
ECM 6 - Building Management System Upgrades

ULYSSES BYAS ELEMENTARY SCHOOL

						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	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	80.0	-	-	-	-	-	-	-	-	-	-	-	76.0	85.0	-	-	-
95 to 100	97.5	-	3	-	3	2	1	74.0	80.0	50	15	65	-	-	-	-	-	65	2	1	76.0	85.0	46	11	57
90 to 95	92.5	-	18	3	21	14	7	74.0	80.0	253	92	344	-	-	-	-	-	344	13	8	76.0	85.0	212	61	273
85 to 90	87.5	-	100	18	118	76	42	74.0	80.0	1,029	313	1,343	-	-	-	-	-	1,343	71	47	76.0	85.0	821	116	938
80 to 85	82.5	37	292	126	455	251	204	74.0	80.0	2,130	511	2,641	-	-	-	-	-	2,641	215	240	76.0	85.0	1,399	-	1,399
75 to 80	77.5	189	289	247	725	315	410	74.0	80.0	1,102	-	1,102	-	-	-	-	-	1,102	240	485	76.0	85.0	360	-	360
70 to 75	72.5	275	200	270	745	277	468	74.0	80.0	-	-	-	-	-	-	-	-	-	192	553	76.0	85.0	-	-	-
65 to 70	67.5	236	184	245	665	250	415	74.0	80.0	-	-	-	-	-	-	-	-	-	174	491	76.0	85.0	-	-	-
60 to 65	62.5	232	158	196	586	217	369	74.0	80.0	-	-	-	-	-	-	-	-	-	154	432	76.0	85.0	-	-	-
Total		969	1,244	1,105	3,318	1,401	1,917			4,564	931	5,495			-	-	-	**5,495**	1,062	2,256			2,839	188	**3,027**
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]
						Building	Building	Section 1	Section 1	Section 1	Section 1	Section 1	Section 2	Section 2	Section 2	Section 2	Section 2	Building							
HEATING																									
55 to 60	57.5	60	127	96	283	130	153	71.0	60.0	1,753	383	2,136	-	-	-	-	-	2,136	101	182	68	55	1,065	-	1,065
50 to 55	52.5	110	178	125	413	185	228	71.0	60.0	3,426	1,709	5,134	-	-	-	-	-	5,134	147	266	68	55	2,275	666	2,941
45 to 50	47.5	108	164	121	393	174	219	71.0	60.0	4,081	2,742	6,823	-	-	-	-	-	6,823	136	257	68	55	2,797	1,924	4,721
40 to 45	42.5	240	251	280	771	308	463	71.0	60.0	8,774	8,105	16,879	-	-	-	-	-	16,879	222	549	68	55	5,665	6,861	12,525
35 to 40	37.5	355	282	362	999	378	621	71.0	60.0	12,651	13,981	26,631	-	-	-	-	-	26,631	265	734	68	55	8,077	12,848	20,925
30 to 35	32.5	239	120	167	526	184	342	71.0	60.0	7,076	9,411	16,487	-	-	-	-	-	16,487	128	398	68	55	4,558	8,946	13,504
25 to 30	27.5	109	76	81	266	100	166	71.0	60.0	4,364	5,385	9,748	-	-	-	-	-	9,748	74	192	68	55	2,987	5,287	8,274
20 to 25	22.5	100	51	72	223	78	145	71.0	60.0	3,785	5,436	9,221	-	-	-	-	-	9,221	54	169	68	55	2,470	5,483	7,953
15 to 20	17.5	58	29	25	112	40	72	71.0	60.0	2,159	3,045	5,204	-	-	-	-	-	5,204	31	81	68	55	1,569	3,035	4,604
10 to 15	12.5	10	5	6	21	7	14	71.0	60.0	434	645	1,079	-	-	-	-	-	1,079	5	16	68	55	297	665	962
5 to 10	7.5	8	-	1	9	2	7	71.0	60.0	130	365	495	-	-	-	-	-	495	1	8	68	55	86	360	446
0 to 5	2.5	-	-	-	-	-	-	71.0	60.0	-	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-
-5 to 0	(2.5)	-	-	-	-	-	-	71.0	60.0	-	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-
-10 to -5	(7.5)	-	-	-	-	-	-	71.0	60.0	-	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-
-15 to -10	(12.5)	-	-	-	-	-	-	71.0	60.0	-	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-
Total		1,397	1,283	1,336	4,016	1,586	2,430			48,632	51,206	99,837			-	-	-	**99,837**	1,166	2,850			31,846	46,074	**77,921**

Roosevelt UFSD, NY
Exhibit D-5-6
ECM 6 - Building Management System Upgrades

ROOSEVELT MIDDLE SCHOOL

						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	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	80.0	-	-	-	-	-	-	-	-	-	-	-	76.0	85.0	-	-	-
95 to 100	97.5	-	3	-	3	2	1	74.0	80.0	50	15	65	-	-	-	-	-	65	2	1	76.0	85.0	46	11	57
90 to 95	92.5	-	18	3	21	15	6	74.0	80.0	277	75	352	-	-	-	-	-	352	13	8	76.0	85.0	221	57	278
85 to 90	87.5	-	100	18	118	84	34	74.0	80.0	1,138	253	1,391	-	-	-	-	-	1,391	75	43	76.0	85.0	858	108	967
80 to 85	82.5	37	292	126	455	315	140	74.0	80.0	2,678	350	3,028	-	-	-	-	-	3,028	238	217	76.0	85.0	1,545	-	1,545
75 to 80	77.5	189	289	247	725	467	258	74.0	80.0	1,635	-	1,635	-	-	-	-	-	1,635	284	441	76.0	85.0	426	-	426
70 to 75	72.5	275	200	270	745	458	287	74.0	80.0	-	-	-	-	-	-	-	-	-	240	505	76.0	85.0	-	-	-
65 to 70	67.5	236	184	245	665	412	253	74.0	80.0	-	-	-	-	-	-	-	-	-	217	448	76.0	85.0	-	-	-
60 to 65	62.5	232	158	196	586	356	230	74.0	80.0	-	-	-	-	-	-	-	-	-	189	397	76.0	85.0	-	-	-
Total		969	1,244	1,105	3,318	2,110	1,208			5,779	693	6,472			-	-	-	**6,472**	1,259	2,059			3,097	176	**3,273**
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]
						Building	Building	Section 1	Section 1	Section 1	Section 1	Section 1	Section 2	Section 2	Section 2	Section 2	Section 2	Building							
HEATING																									
55 to 60	57.5	60	127	96	283	186	97	72.0	60.0	2,698	242	2,940	-	-	-	-	-	2,940	119	164	68	55	1,245	-	1,245
50 to 55	52.5	110	178	125	413	266	147	72.0	60.0	5,178	1,106	6,284	-	-	-	-	-	6,284	169	244	68	55	2,621	610	3,231
45 to 50	47.5	108	164	121	393	252	141	72.0	60.0	6,169	1,765	7,934	-	-	-	-	-	7,934	158	235	68	55	3,240	1,762	5,002
40 to 45	42.5	240	251	280	771	486	285	72.0	60.0	14,350	4,980	19,330	-	-	-	-	-	19,330	272	499	68	55	6,940	6,236	13,175
35 to 40	37.5	355	282	362	999	618	381	72.0	60.0	21,338	8,562	29,899	-	-	-	-	-	29,899	329	670	68	55	10,049	11,717	21,766
30 to 35	32.5	239	120	167	526	312	214	72.0	60.0	12,312	5,893	18,205	-	-	-	-	-	18,205	158	368	68	55	5,617	8,275	13,892
25 to 30	27.5	109	76	81	266	161	105	72.0	60.0	7,156	3,419	10,575	-	-	-	-	-	10,575	88	178	68	55	3,573	4,889	8,462
20 to 25	22.5	100	51	72	223	132	91	72.0	60.0	6,559	3,394	9,952	-	-	-	-	-	9,952	67	156	68	55	3,055	5,065	8,120
15 to 20	17.5	58	29	25	112	64	48	72.0	60.0	3,513	2,020	5,534	-	-	-	-	-	5,534	36	76	68	55	1,795	2,867	4,662
10 to 15	12.5	10	5	6	21	12	9	72.0	60.0	733	412	1,145	-	-	-	-	-	1,145	6	15	68	55	357	619	976
5 to 10	7.5	8	-	1	9	4	5	72.0	60.0	276	248	524	-	-	-	-	-	524	2	7	68	55	97	351	448
0 to 5	2.5	-	-	-	-	-	-	72.0	60.0	-	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-
-5 to 0	(2.5)	-	-	-	-	-	-	72.0	60.0	-	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-
-10 to -5	(7.5)	-	-	-	-	-	-	72.0	60.0	-	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-
-15 to -10	(12.5)	-	-	-	-	-	-	72.0	60.0	-	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-
Total		1,397	1,283	1,336	4,016	2,494	1,522			80,281	32,041	112,322			-	-	-	**112,322**	1,404	2,612			38,587	42,392	**80,979**

Roosevelt UFSD, NY
Exhibit D-5-6
ECM 6 - Building Management System Upgrades

ROOSEVELT HIGH SCHOOL

						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	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	-	-	-	-	-	-	73.0	80.0	-	-	-	-	-	-	-	-	-	-	-	76.0	85.0	-	-	-
95 to 100	97.5	-	3	-	3	2	1	73.0	80.0	53	15	68	-	-	-	-	-	68	2	1	76.0	85.0	46	11	57
90 to 95	92.5	-	18	3	21	14	7	73.0	80.0	277	85	362	-	-	-	-	-	362	13	8	76.0	85.0	221	57	278
85 to 90	87.5	-	100	18	118	79	39	73.0	80.0	1,152	289	1,441	-	-	-	-	-	1,441	75	43	76.0	85.0	858	108	967
80 to 85	82.5	37	292	126	455	271	184	73.0	80.0	2,579	459	3,037	-	-	-	-	-	3,037	238	217	76.0	85.0	1,545	-	1,545
75 to 80	77.5	189	289	247	725	350	375	73.0	80.0	1,577	-	1,577	-	-	-	-	-	1,577	284	441	76.0	85.0	426	-	426
70 to 75	72.5	275	200	270	745	312	433	73.0	80.0	-	-	-	-	-	-	-	-	-	240	505	76.0	85.0	-	-	-
65 to 70	67.5	236	184	245	665	283	382	73.0	80.0	-	-	-	-	-	-	-	-	-	217	448	76.0	85.0	-	-	-
60 to 65	62.5	232	158	196	586	242	344	73.0	80.0	-	-	-	-	-	-	-	-	-	189	397	76.0	85.0	-	-	-
Total		969	1,244	1,105	3,318	1,555	1,763			5,637	848	6,485			-	-	-	**6,485**	1,259	2,059			3,097	176	**3,273**
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]
						Building	Building	Section 1	Section 1	Section 1	Section 1	Section 1	Section 2	Section 2	Section 2	Section 2	Section 2	Building							
HEATING																									
55 to 60	57.5	60	127	96	283	144	139	71.0	60.0	1,948	347	2,295	-	-	-	-	-	2,295	119	164	68	55	1,245	-	1,245
50 to 55	52.5	110	178	125	413	203	210	71.0	60.0	3,748	1,578	5,326	-	-	-	-	-	5,326	169	244	68	55	2,621	610	3,231
45 to 50	47.5	108	164	121	393	190	203	71.0	60.0	4,475	2,532	7,007	-	-	-	-	-	7,007	158	235	68	55	3,240	1,762	5,002
40 to 45	42.5	240	251	280	771	347	424	71.0	60.0	9,894	7,418	17,311	-	-	-	-	-	17,311	272	499	68	55	6,940	6,236	13,175
35 to 40	37.5	355	282	362	999	426	573	71.0	60.0	14,285	12,883	27,168	-	-	-	-	-	27,168	329	670	68	55	10,049	11,717	21,766
30 to 35	32.5	239	120	167	526	203	323	71.0	60.0	7,813	8,884	16,697	-	-	-	-	-	16,697	158	368	68	55	5,617	8,275	13,892
25 to 30	27.5	109	76	81	266	110	156	71.0	60.0	4,781	5,073	9,854	-	-	-	-	-	9,854	88	178	68	55	3,573	4,889	8,462
20 to 25	22.5	100	51	72	223	86	137	71.0	60.0	4,192	5,121	9,313	-	-	-	-	-	9,313	67	156	68	55	3,055	5,065	8,120
15 to 20	17.5	58	29	25	112	42	70	71.0	60.0	2,259	2,965	5,225	-	-	-	-	-	5,225	36	76	68	55	1,795	2,867	4,662
10 to 15	12.5	10	5	6	21	8	13	71.0	60.0	470	616	1,086	-	-	-	-	-	1,086	6	15	68	55	357	619	976
5 to 10	7.5	8	-	1	9	2	7	71.0	60.0	119	374	493	-	-	-	-	-	493	2	7	68	55	97	351	448
0 to 5	2.5	-	-	-	-	-	-	71.0	60.0	-	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-
-5 to 0	(2.5)	-	-	-	-	-	-	71.0	60.0	-	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-
-10 to -5	(7.5)	-	-	-	-	-	-	71.0	60.0	-	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-
-15 to -10	(12.5)	-	-	-	-	-	-	71.0	60.0	-	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-
Total		1,397	1,283	1,336	4,016	1,762	2,254			53,985	47,790	101,776			-	-	-	**101,776**	1,404	2,612			38,587	42,392	**80,979**

Roosevelt UFSD, NY
Exhibit D-5-6
ECM 6 - Building Management System Upgrades

SAVINGS SUMMARY

Building ID	kWh Savings	kW Savings	Thermal Savings	Thermal Safety Factor	Electric Safety Factor
	kWh	kW	Therms	%	%
Centennial Avenue Elementary School	72,063	-	6,899	5.0%	5.0%
Washington-Rose Elementary School	131,587	-	13,141	30.0%	10.0%
Ulysses Byas Elementary School	18,194	-	10,657	5.0%	0.0%
Roosevelt Middle School	153,598	-	18,660	5.0%	0.0%
Roosevelt High School	74,200	-	14,994	5.0%	0.0%
Subtotal	449,642	-	64,351		

Roosevelt UFSD, NY
Exhibit D-5-6
ECM 6 - Building Management System Upgrades
Demand Control Ventilation

ECM DESCRIPTION

Implement demand control ventilation strategies where applicable to modulate outside air volume based on space occupancy (CO_2 levels)

DATA / ASSUMPTIONS

Heating Season Hours	4,016	Hours

* Calculation parameters based on customer interviews, field measurements, and design drawings
** Proposed temperature setpoints are used as not to duplicate thermal savings

COMMISSIONING

Simulate function of CO_2 control signal. Test all equipment involved in DCV, which includes but is not limited to testing function of fresh air damper response to the CO_2 sensor signal and sequence of operation per design (Override CO_2 signal during the building warm up, etc.).

RECOVERY/SAFETY FACTOR

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

FORMULAE

$$W_{SAVINGS} = \sum_{-15}^{60} [(kW_{FAN} \cdot t_{OCC\text{-}PROPOSED}) - ((kW_{FAN} \cdot (1 - RPM_{-\%})^{2.7}) \cdot t_{OCC\text{-}PROPOSED})]$$

$$Q_{SAVINGS} = \sum_{-15}^{60} [(((Q_{LOAD} \cdot t_{OCC\text{-}PROPOSED} \cdot OA_{\%OCC}) + (Q_{LOAD} \cdot t_{UNOCC\text{-}PROPOSED} \cdot OA_{\%UNOCC})) / 1{,}000) \cdot 10 / \eta_{BOILER}]$$

$$Q_{LOAD} = \sum_{-15}^{60} [1.08 \cdot CFM_{OA} \cdot (T_{UNOCC\text{-}PROPOSED} - T_{BIN}) / 1000]$$

$$kW_{FAN} = HP \cdot 0.746 \cdot M_{\%}$$

Variable	Units	Description
$W_{SAVINGS}$	kWh	Annual kWh Savings
$Q_{SAVINGS}$	Therms	Annual Thermal Savings
Q_{LOAD}	MBTUh	Thermal load rate of unit at respective temperature bin
kW_{FAN}	kW	Total kW of fan
$\sum_{-15}^{60}$	-	Summation of all bins from -15°F to 60°F
T_{BIN}	°F	Temperature of respective bin
$t_{OCC\text{-}PROPOSED}$	Hrs	Proposed occupied bin hours in respective temperature bin
$t_{UNOCC\text{-}PROPOSED}$	Hrs	Proposed unoccupied bin hours in respective temperature bin
$RPM_{-\%}$	%	Percentage of RPM fan will be reduced due to VFD
$OA_{\%OCC}$	%	Percentage fresh air reduction during occupied hours
$OA_{\%UNOCC}$	%	Percentage fresh air reduction during unoccupied hours
CFM_{OA}	CFM	Total outside air CFM of units
$T_{OCC\text{-}PROPOSED}$	°F	Proposed occupied heating temperature
$T_{UNOCC\text{-}PROPOSED}$	°F	Proposed unoccupied heating temperature
$M_{\%}$	%	Motor load factor
HP	HP	Motor horsepower
η_{BOILER}	%	Boiler Efficiency

Roosevelt UFSD, NY
Exhibit D-5-6
ECM 6 - Building Management System Upgrades
Demand Control Ventilation

* Inputs are in blue

Building	Location	Unit Qty	Total Fan Motor Horsepower [HP]	Total Supply Airflow [CFM]	Total Outside Airflow [CFM]	Proposed Boiler Efficiency [%]
Centennial Avenue Elementary School	Gym	1	7.5	7,200	4,630	79.0%
Washington-Rose Elementary School	Gym	1	7.5	8,000	4,389	89.0%
Ulysses Byas Elementary School	Gym	1	15.0	12,000	4,389	81.0%
Roosevelt High School	Aud	1	20.0	9,116	7,704	89.0%
Roosevelt Middle School	Gym	1	20.0	14,100	3,626	89.0%
Roosevelt High School	Library	1	5.0	4,500	1,943	89.0%
Totals		**6**	**75.0**	**54,916**	**26,681**	

	Centennial Avenue Elementary School	Washington-Rose Elementary School	Ulysses Byas Elementary School	Roosevelt High School	Roosevelt Middle School	Roosevelt High School
Location	Gym	Gym	Gym	Aud	Gym	Library
Unit Quantity	1	1	1	1	1	1
Total Fan Motor Horsepower [HP]	7.5	7.5	15.0	20.0	20.0	5.0
Motor Load Factor [%]	65%	65%	65%	65%	65%	65%
Motor kW Total [kW]	3.64	3.64	7.27	9.70	9.70	2.42
Total Supply Airflow [CFM]	7,200	8,000	12,000	9,116	14,100	4,500
Total Outside Airflow [CFM]	4,630	4,389	4,389	7,704	3,626	1,943
**Proposed Occ. Heating Setpoint [°F]	68.0	68.0	68.0	68.0	68.0	68.0
**Proposed Unocc. Heating Setpoint [°F]	55.0	55.0	55.0	55.0	55.0	55.0
**Proposed Occ. Cooling Setpoint [°F]	76.0	76.0	76.0	76.0	76.0	76.0
**Proposed Unocc. Cooling Setpoint [°F]	85.0	85.0	85.0	85.0	85.0	85.0
Proposed Boiler Efficiency [%]	79.0%	89.0%	81.0%	89.0%	89.0%	89.0%
Average Fan Speed Reduction [%]	0%	0%	0%	0%	0%	0%
Average Occupied Heating Reduction [%]	20%	20%	20%	20%	20%	20%
Average Unoccupied Heating Reduction [%]	25%	25%	25%	25%	25%	25%
Electric Safety Factor [%]	0%	0%	0%	0%	0%	0%
Thermal Safety Factor [%]	0%	0%	0%	0%	0%	0%
Electrical Savings [kWh]	-	-	-	-	-	-
Thermal Savings [Therms]	944	794	872	1,376	648	347

Roosevelt UFSD, NY
Exhibit D-5-6
ECM 6 - Building Management System Upgrades
Demand Control Ventilation

CALCULATIONS

CENTENNIAL AVENUE ELEMENTARY SCHOOL **GYM**

Amb. Temp Bin [°F]	Ave Temp [°F]	01-08 Hours	09-16 Hours	17-24 Hours	Total Bin Hours	Occ. Bin Hours	Unocc. Bin Hours	Outside Air Flowrate [CFM]	OA Air Load [MBTUh]	Annual Fan Electrical Savings [kWh]	Annual Occ. Heating Savings [MMBTU]	Annual Unocc. Heating Savings [MMBTU]	Total Heating Savings [Therms]
HEATING													
55 to 60	57.5	60	127	96	283	101	182	4,630	-	-	-	-	-
50 to 55	52.5	110	178	125	413	147	266	4,630	12.5	-	0.4	0.8	15
45 to 50	47.5	108	164	121	393	136	257	4,630	37.5	-	1.0	2.4	43
40 to 45	42.5	240	251	280	771	222	549	4,630	62.5	-	2.8	8.6	144
35 to 40	37.5	355	282	362	999	265	734	4,630	87.5	-	4.6	16.1	262
30 to 35	32.5	239	120	167	526	128	398	4,630	112.5	-	2.9	11.2	178
25 to 30	27.5	109	76	81	266	74	192	4,630	137.5	-	2.0	6.6	109
20 to 25	22.5	100	51	72	223	54	169	4,630	162.5	-	1.8	6.9	109
15 to 20	17.5	58	29	25	112	31	81	4,630	187.5	-	1.2	3.8	63
10 to 15	12.5	10	5	6	21	5	16	4,630	212.5	-	0.2	0.8	13
5 to 10	7.5	8	-	1	9	1	8	4,630	237.5	-	0.1	0.4	7
0 to 5	2.5	-	-	-	-	-	-	4,630	262.5	-	-	-	-
-5 to 0	-2.5	-	-	-	-	-	-	4,630	287.5	-	-	-	-
-10 to -5	-7.5	-	-	-	-	-	-	4,630	312.5	-	-	-	-
-15 to -10	-12.5	-	-	-	-	-	-	4,630	337.5	-	-	-	-
Total		1,397	1,283	1,336	4,016	1,166	2,850			-	16.9	57.6	944

WASHINGTON-ROSE ELEMENTARY SCHOOL **GYM**

Amb. Temp Bin [°F]	Ave Temp [°F]	01-08 Hours	09-16 Hours	17-24 Hours	Total Bin Hours	Occ. Bin Hours	Unocc. Bin Hours	Outside Air Flowrate [CFM]	OA Air Load [MBTUh]	Annual Fan Electrical Savings [kWh]	Annual Occ. Heating Savings [MMBTU]	Annual Unocc. Heating Savings [MMBTU]	Total Heating Savings [Therms]
HEATING													
55 to 60	57.5	60	127	96	283	101	182	4,389	-	-	-	-	-
50 to 55	52.5	110	178	125	413	147	266	4,389	11.9	-	0.3	0.8	13
45 to 50	47.5	108	164	121	393	136	257	4,389	35.6	-	1.0	2.3	37
40 to 45	42.5	240	251	280	771	222	549	4,389	59.3	-	2.6	8.1	121
35 to 40	37.5	355	282	362	999	265	734	4,389	83.0	-	4.4	15.2	220
30 to 35	32.5	239	120	167	526	128	398	4,389	106.7	-	2.7	10.6	150
25 to 30	27.5	109	76	81	266	74	192	4,389	130.4	-	1.9	6.3	92
20 to 25	22.5	100	51	72	223	54	169	4,389	154.1	-	1.7	6.5	92
15 to 20	17.5	58	29	25	112	31	81	4,389	177.8	-	1.1	3.6	53
10 to 15	12.5	10	5	6	21	5	16	4,389	201.5	-	0.2	0.8	11
5 to 10	7.5	8	-	1	9	1	8	4,389	225.2	-	0.1	0.4	6
0 to 5	2.5	-	-	-	-	-	-	4,389	248.9	-	-	-	-
-5 to 0	-2.5	-	-	-	-	-	-	4,389	272.6	-	-	-	-
-10 to -5	-7.5	-	-	-	-	-	-	4,389	296.3	-	-	-	-
-15 to -10	-12.5	-	-	-	-	-	-	4,389	320.0	-	-	-	-
Total		1,397	1,283	1,336	4,016	1,166	2,850			-	16.1	54.6	794

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ECM 6 - Building Management System Upgrades
Demand Control Ventilation

ULYSSES BYAS ELEMENTARY SCHOOL **GYM**

Amb. Temp Bin [°F]	Ave Temp [°F]	01-08 Hours	09-16 Hours	17-24 Hours	Total Bin Hours	Occ. Bin Hours	Unocc. Bin Hours	Outside Air Flowrate [CFM]	OA Air Load [MBTUh]	Annual Fan Electrical Savings [kWh]	Annual Occ. Heating Savings [MMBTU]	Annual Unocc. Heating Savings [MMBTU]	Total Heating Savings [Therms]
HEATING													
55 to 60	57.5	60	127	96	283	101	182	4,389	-	-	-	-	-
50 to 55	52.5	110	178	125	413	147	266	4,389	11.9	-	0.3	0.8	14
45 to 50	47.5	108	164	121	393	136	257	4,389	35.6	-	1.0	2.3	40
40 to 45	42.5	240	251	280	771	222	549	4,389	59.3	-	2.6	8.1	133
35 to 40	37.5	355	282	362	999	265	734	4,389	83.0	-	4.4	15.2	242
30 to 35	32.5	239	120	167	526	128	398	4,389	106.7	-	2.7	10.6	165
25 to 30	27.5	109	76	81	266	74	192	4,389	130.4	-	1.9	6.3	101
20 to 25	22.5	100	51	72	223	54	169	4,389	154.1	-	1.7	6.5	101
15 to 20	17.5	58	29	25	112	31	81	4,389	177.8	-	1.1	3.6	58
10 to 15	12.5	10	5	6	21	5	16	4,389	201.5	-	0.2	0.8	12
5 to 10	7.5	8	-	1	9	1	8	4,389	225.2	-	0.1	0.4	6
0 to 5	2.5	-	-	-	-	-	-	4,389	248.9	-	-	-	-
-5 to 0	-2.5	-	-	-	-	-	-	4,389	272.6	-	-	-	-
-10 to -5	-7.5	-	-	-	-	-	-	4,389	296.3	-	-	-	-
-15 to -10	-12.5	-	-	-	-	-	-	4,389	320.0	-	-	-	-
Total		1,397	1,283	1,336	4,016	1,166	2,850			-	16.1	54.6	872

ROOSEVELT HIGH SCHOOL **AUD**

Amb. Temp Bin [°F]	Ave Temp [°F]	01-08 Hours	09-16 Hours	17-24 Hours	Total Bin Hours	Occ. Bin Hours	Unocc. Bin Hours	Outside Air Flowrate [CFM]	OA Air Load [MBTUh]	Annual Fan Electrical Savings [kWh]	Annual Occ. Heating Savings [MMBTU]	Annual Unocc. Heating Savings [MMBTU]	Total Heating Savings [Therms]
HEATING													
55 to 60	57.5	60	127	96	283	119	164	7,704	-	-	-	-	-
50 to 55	52.5	110	178	125	413	169	244	7,704	20.8	-	0.7	1.3	22
45 to 50	47.5	108	164	121	393	158	235	7,704	62.4	-	2.0	3.7	63
40 to 45	42.5	240	251	280	771	272	499	7,704	104.0	-	5.7	13.0	209
35 to 40	37.5	355	282	362	999	329	670	7,704	145.6	-	9.6	24.4	382
30 to 35	32.5	239	120	167	526	158	368	7,704	187.2	-	5.9	17.2	260
25 to 30	27.5	109	76	81	266	88	178	7,704	228.8	-	4.0	10.2	160
20 to 25	22.5	100	51	72	223	67	156	7,704	270.4	-	3.6	10.5	159
15 to 20	17.5	58	29	25	112	36	76	7,704	312.0	-	2.2	6.0	92
10 to 15	12.5	10	5	6	21	6	15	7,704	353.6	-	0.5	1.3	20
5 to 10	7.5	8	-	1	9	2	7	7,704	395.2	-	0.1	0.7	10
0 to 5	2.5	-	-	-	-	-	-	7,704	436.8	-	-	-	-
-5 to 0	-2.5	-	-	-	-	-	-	7,704	478.4	-	-	-	-
-10 to -5	-7.5	-	-	-	-	-	-	7,704	520.0	-	-	-	-
-15 to -10	-12.5	-	-	-	-	-	-	7,704	561.6	-	-	-	-
Total		1,397	1,283	1,336	4,016	1,404	2,612			-	34.3	88.2	1,376

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ROOSEVELT MIDDLE SCHOOL **GYM**

Amb. Temp Bin [°F]	Ave Temp [°F]	01-08 Hours	09-16 Hours	17-24 Hours	Total Bin Hours	Occ. Bin Hours	Unocc. Bin Hours	Outside Air Flowrate [CFM]	OA Air Load [MBTUh]	Annual Fan Electrical Savings [kWh]	Annual Occ. Heating Savings [MMBTU]	Annual Unocc. Heating Savings [MMBTU]	Total Heating Savings [Therms]
HEATING													
55 to 60	57.5	60	127	96	283	119	164	3,626	-	-	-	-	-
50 to 55	52.5	110	178	125	413	169	244	3,626	9.8	-	0.3	0.6	10
45 to 50	47.5	108	164	121	393	158	235	3,626	29.4	-	0.9	1.7	30
40 to 45	42.5	240	251	280	771	272	499	3,626	49.0	-	2.7	6.1	99
35 to 40	37.5	355	282	362	999	329	670	3,626	68.5	-	4.5	11.5	180
30 to 35	32.5	239	120	167	526	158	368	3,626	88.1	-	2.8	8.1	122
25 to 30	27.5	109	76	81	266	88	178	3,626	107.7	-	1.9	4.8	75
20 to 25	22.5	100	51	72	223	67	156	3,626	127.3	-	1.7	5.0	75
15 to 20	17.5	58	29	25	112	36	76	3,626	146.9	-	1.0	2.8	43
10 to 15	12.5	10	5	6	21	6	15	3,626	166.4	-	0.2	0.6	9
5 to 10	7.5	8	-	1	9	2	7	3,626	186.0	-	0.1	0.3	5
0 to 5	2.5	-	-	-	-	-	-	3,626	205.6	-	-	-	-
-5 to 0	-2.5	-	-	-	-	-	-	3,626	225.2	-	-	-	-
-10 to -5	-7.5	-	-	-	-	-	-	3,626	244.8	-	-	-	-
-15 to -10	-12.5	-	-	-	-	-	-	3,626	264.3	-	-	-	-
Total		1,397	1,283	1,336	4,016	1,404	2,612			-	16.2	41.5	648

ROOSEVELT HIGH SCHOOL **LIBRARY**

Amb. Temp Bin [°F]	Ave Temp [°F]	01-08 Hours	09-16 Hours	17-24 Hours	Total Bin Hours	Occ. Bin Hours	Unocc. Bin Hours	Outside Air Flowrate [CFM]	OA Air Load [MBTUh]	Annual Fan Electrical Savings [kWh]	Annual Occ. Heating Savings [MMBTU]	Annual Unocc. Heating Savings [MMBTU]	Total Heating Savings [Therms]
HEATING													
55 to 60	57.5	60	127	96	283	119	164	1,943	-	-	-	-	-
50 to 55	52.5	110	178	125	413	169	244	1,943	5.2	-	0.2	0.3	6
45 to 50	47.5	108	164	121	393	158	235	1,943	15.7	-	0.5	0.9	16
40 to 45	42.5	240	251	280	771	272	499	1,943	26.2	-	1.4	3.3	53
35 to 40	37.5	355	282	362	999	329	670	1,943	36.7	-	2.4	6.1	96
30 to 35	32.5	239	120	167	526	158	368	1,943	47.2	-	1.5	4.3	66
25 to 30	27.5	109	76	81	266	88	178	1,943	57.7	-	1.0	2.6	40
20 to 25	22.5	100	51	72	223	67	156	1,943	68.2	-	0.9	2.7	40
15 to 20	17.5	58	29	25	112	36	76	1,943	78.7	-	0.6	1.5	23
10 to 15	12.5	10	5	6	21	6	15	1,943	89.2	-	0.1	0.3	5
5 to 10	7.5	8	-	1	9	2	7	1,943	99.7	-	0.0	0.2	2
0 to 5	2.5	-	-	-	-	-	-	1,943	110.2	-	-	-	-
-5 to 0	-2.5	-	-	-	-	-	-	1,943	120.7	-	-	-	-
-10 to -5	-7.5	-	-	-	-	-	-	1,943	131.2	-	-	-	-
-15 to -10	-12.5	-	-	-	-	-	-	1,943	141.6	-	-	-	-
Total		1,397	1,283	1,336	4,016	1,404	2,612			-	8.7	22.2	347

Roosevelt UFSD, NY
Exhibit D-5-6
ECM 6 - Building Management System Upgrades
Demand Control Ventilation

SAVINGS SUMMARY

Building ID	kWh Savings	Thermal Savings	Electric Safety Factor	Thermal Safety Factor
	kWh	Therms	%	%
Centennial Avenue Elementary School	-	944	0.0%	0.0%
Washington-Rose Elementary School	-	794	0.0%	0.0%
Ulysses Byas Elementary School	-	872	0.0%	0.0%
Roosevelt Middle School	-	648	0.0%	0.0%
Roosevelt High School	-	1,724	0.0%	0.0%
Subtotal	-	4,981		

Roosevelt UFSD, NY
Exhibit D-5-6
ECM 6 - Building Management System Upgrades
Plug Load Controls - Summary

CALCULATION SUMMARY

	Centennial Avenue Elementary School	Washington-Rose Elementary School	Ulysses Byas Elementary School	Roosevelt Middle School	Roosevelt High School
Include BERT Savings	Y	Y	Y	Y	Y
# of BERTS	15	25	28	27	32
BERT Savings [kWh]	2,599	3,070	3,883	3,981	10,438
Electric Safety Factor [%]	0%	0%	0%	0%	0%
Total Electric Savings [kWh]	2,599	3,070	3,883	3,981	10,438

SAVINGS SUMMARY

Building ID	kWh Savings	Electric Safety Factor
	kWh	%
Centennial Avenue Elementary School	2,599	0.0%
Washington-Rose Elementary School	3,070	0.0%
Ulysses Byas Elementary School	3,883	0.0%
Roosevelt Middle School	3,981	0.0%
Roosevelt High School	10,438	0.0%
Subtotal	23,972	

Roosevelt UFSD, NY
Exhibit D-5-6
ECM 6 - Building Management System Upgrades
Plug Load Controls

Centennial Avenue Elementary School

Equipment	Number of Berts	Total Number of Devices	Typical Use, Weekday On Days	Typical Use, Weekend On Days	On Time Hours (Weekdays)	On Time Hours (Weekends)	Parasitic Load Watts	Months / Year	Existing Annual On Hours	Proposed Annual On Hours	Annual kWh Savings
Projector	2	2	210	-	11	-	8	9	8,760	2,310	103
Medium Printer	3	3	210	-	11	-	15	9	8,760	2,310	290
Charging Cart	8	8	210	-	11	-	37	9	8,760	2,310	1,909
Smartboard	-	-	210	-	11	-	8	9	8,760	2,310	-
AC-110 15 A	-	-	210	-	11	-	8	9	8,760	2,310	-
AC-220 20A	-	-	210	-	11	-	8	9	8,760	2,310	-
Copier	1	1	210	-	11	-	40	9	8,760	2,310	258
H/C Water	-	-	210	-	11	-	61	9	8,760	2,310	-
Soda Vend	-	-	210	-	11	-	320	9	8,760	2,310	-
Snack Vend	-	-	210	-	11	-	40	9	8,760	2,310	-
Large Coffee	-	-	210	-	11	-	56	9	8,760	2,310	-
TV/Monitor	1	1	210	-	11	-	6	9	8,760	2,310	39
Water Heater	-	-	210	-	11	-	80	9	8,760	2,310	-
SUB TOTAL	15	15									2,599

Washington-Rose Elementary School

Equipment	Number of Berts	Total Number of Devices	Typical Use, Weekday On Days	Typical Use, Weekend On Days	On Time Hours (Weekdays)	On Time Hours (Weekends)	Parasitic Load Watts	Months / Year	Existing Annual On Hours	Proposed Annual On Hours	Annual kWh Savings
Projector	-	-	210	-	11	-	8	9	8,760	2,310	-
Medium Printer	19	19	210	-	11	-	15	9	8,760	2,310	1,838
Charging Cart	5	5	210	-	11	-	37	9	8,760	2,310	1,193
Smartboard	-	-	210	-	11	-	8	9	8,760	2,310	-
AC-110 15 A	-	-	210	-	11	-	8	9	8,760	2,310	-
AC-220 20A	-	-	210	-	11	-	8	9	8,760	2,310	-
Copier	-	-	210	-	11	-	40	9	8,760	2,310	-
H/C Water	-	-	210	-	11	-	61	9	8,760	2,310	-
Soda Vend	-	-	210	-	11	-	320	9	8,760	2,310	-
Snack Vend	-	-	210	-	11	-	40	9	8,760	2,310	-
Large Coffee	-	-	210	-	11	-	56	9	8,760	2,310	-
TV/Monitor	-	-	210	-	11	-	6	9	8,760	2,310	-
Water Heater	-	-	210	-	11	-	80	9	8,760	2,310	-
Book Vend	1	1	210	-	11	-	6	9	8,760	2,310	39
SUB TOTAL	25	25									3,070

Roosevelt UFSD, NY
Exhibit D-5-6
ECM 6 - Building Management System Upgrades
Plug Load Controls

Ulysses Byas Elementary School

Equipment	Number of Berts	Total Number of Devices	Typical Use, Weekday On Days	Typical Use, Weekend On Days	On Time Hours (Weekdays)	On Time Hours (Weekends)	Parasitic Load Watts	Months / Year	Existing Annual On Hours	Proposed Annual On Hours	Annual kWh Savings
Projector	-	-	210	-	11	-	8	9	8,760	2,310	-
Medium Printer	20	20	210	-	11	-	15	9	8,760	2,310	1,935
Charging Cart	6	6	210	-	11	-	37	9	8,760	2,310	1,432
Smartboard	-	-	210	-	11	-	8	9	8,760	2,310	-
AC-110 15 A	-	-	210	-	11	-	8	9	8,760	2,310	-
AC-220 20A	-	-	210	-	11	-	8	9	8,760	2,310	-
Copier	2	2	210	-	11	-	40	9	8,760	2,310	516
H/C Water	-	-	210	-	11	-	61	9	8,760	2,310	-
Soda Vend	-	-	210	-	11	-	320	9	8,760	2,310	-
Snack Vend	-	-	210	-	11	-	40	9	8,760	2,310	-
Large Coffee	-	-	210	-	11	-	56	9	8,760	2,310	-
TV/Monitor	-	-	210	-	11	-	6	9	8,760	2,310	-
Water Heater	-	-	210	-	11	-	80	9	8,760	2,310	-
SUB TOTAL	28	28									3,883

Roosevelt Middle School

Equipment	Number of Berts	Total Number of Devices	Typical Use, Weekday On Days	Typical Use, Weekend On Days	On Time Hours (Weekdays)	On Time Hours (Weekends)	Parasitic Load Watts	Months / Year	Existing Annual On Hours	Proposed Annual On Hours	Annual kWh Savings
Projector	2	2	210	-	12	10	8	9	8,760	2,520	100
Medium Printer	15	15	210	-	12	10	15	9	8,760	2,520	1,404
Charging Cart	8	8	210	-	12	10	37	9	8,760	2,520	1,847
Smartboard	-	-	210	-	12	10	8	9	8,760	2,520	-
AC-110 15 A	-	-	210	-	12	10	8	9	8,760	2,520	-
AC-220 20A	-	-	210	-	12	10	8	9	8,760	2,520	-
Copier	1	1	210	-	12	10	40	9	8,760	2,520	250
H/C Water	1	1	210	-	12	10	61	9	8,760	2,520	381
Soda Vend	-	-	210	-	12	10	320	9	8,760	2,520	-
Snack Vend	-	-	210	-	12	10	40	9	8,760	2,520	-
Large Coffee	-	-	210	-	12	10	56	9	8,760	2,520	-
TV/Monitor	-	-	210	-	12	10	6	9	8,760	2,520	-
Water Heater	-	-	210	-	12	10	80	9	8,760	2,520	-
SUB TOTAL	27	27									3,981

Roosevelt UFSD, NY
Exhibit D-5-6
ECM 6 - Building Management System Upgrades
Plug Load Controls

Roosevelt High School

Equipment	Number of Berts	Total Number of Devices	Typical Use, Weekday On Days	Typical Use, Weekend On Days	On Time Hours (Weekdays)	On Time Hours (Weekends)	Parasitic Load Watts	Months / Year	Existing Annual On Hours	Proposed Annual On Hours	Annual kWh Savings
Projector	-	-	210	-	13	-	8	9	8,760	2,730	-
Medium Printer	7	7	210	-	13	-	15	9	8,760	2,730	633
Charging Cart	13	13	210	-	13	-	37	9	8,760	2,730	2,900
Smartboard	-	-	210	-	13	-	8	9	8,760	2,730	-
AC-110 15 A	-	-	210	-	13	-	8	9	8,760	2,730	-
AC-220 20A	-	-	210	-	13	-	8	9	8,760	2,730	-
Copier	3	3	210	-	13	-	40	9	8,760	2,730	724
H/C Water	5	5	210	-	13	-	61	9	8,760	2,730	1,839
Soda Vend	2	2	210	-	13	-	320	9	8,760	2,730	3,859
Snack Vend	2	2	210	-	13	-	40	9	8,760	2,730	482
Large Coffee	-	-	210	-	13	-	56	9	8,760	2,730	-
TV/Monitor	-	-	210	-	13	-	6	9	8,760	2,730	-
Water Heater	-	-	210	-	13	-	80	9	8,760	2,730	-
SUB TOTAL	**32**	**32**									**10,438**

Roosevelt UFSD, NY
Exhibit D-5-6
ECM 6 - Building Management System Upgrades
Plug Load Controls

	Number of Berts	Total Number of Devices									Annual kWh Savings
GRAND TOTAL	127	127									23,972

Roosevelt UFSD, NY
Exhibit D-5-6
ECM 6 - Building Management System Upgrades

ECM DESCRIPTION

Switch third party natural gas suppliers

DATA / ASSUMPTIONS

Estimated cost of Natural Gas based on baseline rates of Centennial Avenue School National Grid supplier rate.

RECOVERY/SAFETY FACTOR

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

CALCULATIONS

	Ulysses Byas Elementary School
Third Party Supplier Switch Applicable (Y/N)	**Y**
Existing Supplier	**Gateway Energy**
Proposed Supplier	**National Grid**
Adjusted Building Usage [Therms]	40,147
Existing Cost of Natural Gas [$/Therm]	$ 1.29
Estimated Cost of Natural Gas [$/Therm]	$ 1.08
Estimated Cost Difference of Natural Gas [$/Therm]	**$ 0.21**
Post Project Natural Gas Cost Savings [$]	$ 8,332
Safety Factor [%]	**15%**
Savings [$]	$ 7,082

Roosevelt UFSD, NY
Exhibit D-5-7
ECM 7 - Building Envelope Improvements

ECM DESCRIPTION

Reduce building infiltration by weather stripping doors, sealing roof & wall joints, duct & piping penetrations, skylight perimeters and window corners. Install insulation where applicable.

DATA / ASSUMPTIONS

*Crack area determined by survey team

COMMISSIONING

Visual inspection per scope of work from subcontractor. Inspection might include smoke test.

RECOVERY/SAFETY FACTOR

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

FORMULAE

$S_{SAVINGS} = ((1.08 \cdot Q_{EXISTING} \cdot \Delta T) - (1.08 \cdot Q_{PROPOSED} \cdot \Delta T)) \cdot T_{OCC/UNOCC}$

$Q_{PROPOSED} = A_{CRACK\text{-}PROPOSED} \cdot WD \cdot \sqrt{} (C_{STACK} \cdot \Delta T + C_{WIND} \cdot (V_{WIND})^2)$

$Q_{EXISTING} = A_{CRACK\text{-}EXISTING} \cdot WD \cdot \sqrt{} (C_{STACK} \cdot \Delta T + C_{WIND} \cdot (V_{WIND})^2)$

Variable	Units	Description
$S_{SAVINGS}$	BTU	Total sensible infiltration/exfiltration energy savings
$Q_{PROPOSED}$	CFM	Proposed infiltration/exfiltration air flow rate
$Q_{EXISTING}$	CFM	Existing infiltration/exfiltration air flow rate
ΔT	°F	Temperature difference between interior and exterior (based on bin data)
$T_{OCC/UNOCC}$	Hours	Occupied/unoccupied bin hours
V_{WIND}	MPH	Average wind speed
C_{WIND}	$CFM^2 / in^4 \cdot MPH^2$	Wind coefficient
WD	%	Wind diversity factor
C_{STACK}	$CFM^2 / in^4 \cdot °F$	Stack coefficient
$A_{CRACK\text{-}PROPOSED}$	in^2	Total crack area after retrofit
$A_{CRACK\text{-}EXISTING}$	in^2	Total crack area before retrofit

Roosevelt UFSD, NY
Exhibit D-5-7
ECM 7 - Building Envelope Improvements

ASSUMPTIONS / DATA

	Calculated Savings			
Building	Electric Savings [kWh]	Thermal Savings [Therms]	Electric De-Rate [%]	Thermal De-Rate [%]
Centennial Avenue Elementary School	1,154	760	0%	0%
Washington-Rose Elementary School	1,041	686	0%	0%
Ulysses Byas Elementary School	684	451	0%	0%
Roosevelt Middle School	1,824	1,202	0%	0%
Roosevelt High School	4,093	2,697	0%	0%
Totals	**8,795**	**5,796**		

SAVINGS SUMMARY

Building ID	kWh Savings	Thermal Savings	Electric Safety Factor	Thermal Safety Factor
	kWh	Therms	%	%
Centennial Avenue Elementary School	1,154	760	0.0%	0.0%
Washington-Rose Elementary School	1,041	686	0.0%	0.0%
Ulysses Byas Elementary School	684	451	0.0%	0.0%
Roosevelt Middle School	1,824	1,202	0.0%	0.0%
Roosevelt High School	4,093	2,697	0.0%	0.0%
Subtotal	8,795	5,796		

Roosevelt UFSD, NY
Exhibit D-5-7
ECM 7 - Building Envelope Improvements
Building Envelope LxL

Building	Report Group	Task	Units	Crack Size	Units	LF/ Unit	Work Summary	Crack Length (LF)	Leakage Area (SF)	Savings (CFM)	Total Heating Savings (MMBtu)	Total Cooling Savings (MMBtu)	Total Savings (MMBtu)	Total Heating Savings (Fuel Units)	Total Cooling Savings (Fuel Units)	Heating Fuel Units	Cooling Fuel Units
Centennial Avenue Elementary School	Door Weather Stripping	Install Door Jamb Spacer (UT)	3		3.0		Door - Install Jamb Spacer (Units)	-	-	-	-	-	-	-	-	therms	kWh
Centennial Avenue Elementary School	Door Weather Stripping	Double Door - Sides, Sweep, Center (UT)	5	0.125	5.0	27	Door Weather Striping - Doubles (Units)	135.0	1.4	192.9	32.4	1.7	34.0	323.7	491.3	therms	kWh
Centennial Avenue Elementary School	Door Weather Stripping	Double Door - Sweep, Center (UT)	7	0.125	7.0	13	Door Weather Striping - Doubles (Units)	91.0	0.9	130.0	21.8	1.1	23.0	218.2	331.1	therms	kWh
Centennial Avenue Elementary School	Door Weather Stripping	Single Door - Sides, Sweep (UT)	3	0.125	3.0	17	Door Weather Stripping - Singles (Units)	51.0	0.5	72.9	12.2	0.6	12.9	122.3	185.6	therms	kWh
Centennial Avenue Elementary School	Door Weather Stripping	Single Door - Sides, Top, Sweep (UT)	2	0.125	2.0	20	Door Weather Stripping - Singles (Units)	40.0	0.4	57.1	9.6	0.5	10.1	95.9	145.6	therms	kWh
Roosevelt High School	Buck Frame Air Sealing	Block, Seal (LF)	8	0.083	8.0	1	Buck Frame Air Sealing (LF)	8.0	0.1	7.6	1.3	0.1	1.3	12.8	19.4	therms	kWh
Roosevelt High School	Door Weather Stripping	Double Door - Sides, Top, Sweep (UT)	1	0.125	1.0	26	Door Weather Striping - Doubles (Units)	26.0	0.3	37.1	6.2	0.3	6.6	62.3	94.6	therms	kWh
Roosevelt High School	Door Weather Stripping	Double Door - Sides, Top, Sweep, Center (UT)	17	0.125	17.0	33	Door Weather Striping - Doubles (Units)	561.0	5.8	801.5	134.5	7.0	141.5	1,345.3	2,041.5	therms	kWh
Roosevelt High School	Door Weather Stripping	Double Door - Sweep (UT)	16	0.125	16.0	6	Door Weather Striping - Doubles (Units)	96.0	1.0	137.2	23.0	1.2	24.2	230.2	349.3	therms	kWh
Roosevelt High School	Door Weather Stripping	Single Door - Sides, Top, Sweep (UT)	11	0.125	11.0	20	Door Weather Stripping - Singles (Units)	220.0	2.3	314.3	52.8	2.7	55.5	527.6	800.6	therms	kWh
Roosevelt High School	Door Weather Stripping	Single Door - Sweep (UT)	3	0.125	3.0	3	Door Weather Stripping - Singles (Units)	9.0	0.1	12.9	2.2	0.1	2.3	21.6	32.8	therms	kWh
Roosevelt High School	Overhang Air Sealing	Seal (LF)	19	0.083	19.0	1	Overhang Air Sealing (LF)	19.0	0.1	18.1	3.0	0.2	3.2	30.4	46.1	therms	kWh
Roosevelt High School	Overhang Air Sealing	Block, Seal (SF)	20	0.125	20.0	0.5	Overhang Air Sealing (SF)	10.0	0.1	14.3	2.4	0.1	2.5	24.0	36.4	therms	kWh
Roosevelt High School	Roof-Wall Intersection Air Sealing	Seal (LF)	554	0.042	554.0	1	Roof-Wall Intersection Air Sealing (LF)	554.0	1.9	263.8	44.3	2.3	46.6	442.8	672.0	therms	kWh
Roosevelt Middle School	Garage Door Weather Stripping	Roll-Up Door Weather Strip - Sides, Top	2	0.125	2.0	30.5	Roll-Up Door Weather Stripping (Units)	61.0	0.6	87.2	14.6	0.8	15.4	146.3	222.0	therms	kWh
Roosevelt Middle School	Door Weather Stripping	Double Door - Sides, Top, Sweep, Center (UT)	7	0.125	7.0	33	Door Weather Striping - Doubles (Units)	231.0	2.4	330.0	55.4	2.9	58.3	553.9	840.6	therms	kWh
Roosevelt Middle School	Door Weather Stripping	Double Door - Sweep, Center (UT)	3	0.125	3.0	13	Door Weather Striping - Doubles (Units)	39.0	0.4	55.7	9.4	0.5	9.8	93.5	141.9	therms	kWh
Roosevelt Middle School	Door Weather Stripping	Single Door - Sides, Top, Sweep (UT)	5	0.125	5.0	20	Door Weather Stripping - Singles (Units)	100.0	1.0	142.9	24.0	1.2	25.2	239.8	363.9	therms	kWh
Roosevelt Middle School	Door Weather Stripping	Single Door - Sweep (UT)	3	0.125	3.0	3	Door Weather Stripping - Singles (Units)	9.0	0.1	12.9	2.2	0.1	2.3	21.6	32.8	therms	kWh
Roosevelt Middle School	Overhang Air Sealing	Seal Firestop (LF)	46	0.167	46.0	1	Overhang Air Sealing (LF)	46.0	0.6	87.6	14.7	0.8	15.5	147.1	223.2	therms	kWh
Ulysses Byas Elementary School	Door Weather Stripping	Double Door - Sweep (UT)	1	0.125	1.0	6	Door Weather Striping - Doubles (Units)	6.0	0.1	8.6	1.4	0.1	1.5	14.4	21.8	therms	kWh
Ulysses Byas Elementary School	Door Weather Stripping	Double Door - Sweep, Center (UT)	14	0.125	14.0	13	Door Weather Striping - Doubles (Units)	182.0	1.9	260.0	43.6	2.3	45.9	436.4	662.3	therms	kWh
Washington-Rose Elementary School	Door Weather Stripping	Double Door - Sides, Sweep, Center (UT)	3	0.125	3.0	27	Door Weather Striping - Doubles (Units)	81.0	0.8	115.7	19.4	1.0	20.4	194.2	294.8	therms	kWh
Washington-Rose Elementary School	Door Weather Stripping	Double Door - Sides, Top, Sweep, Center (UT)	2	0.125	2.0	33	Door Weather Striping - Doubles (Units)	66.0	0.7	94.3	15.8	0.8	16.6	158.3	240.2	therms	kWh
Washington-Rose Elementary School	Door Weather Stripping	Double Door - Sweep (UT)	4	0.125	4.0	6	Door Weather Striping - Doubles (Units)	24.0	0.3	34.3	5.8	0.3	6.1	57.6	87.3	therms	kWh
Washington-Rose Elementary School	Door Weather Stripping	Double Door - Sweep, Center (UT)	4	0.125	4.0	13	Door Weather Striping - Doubles (Units)	52.0	0.5	74.3	12.5	0.6	13.1	124.7	189.2	therms	kWh
Washington-Rose Elementary School	Door Weather Stripping	Single Door - Sides, Top, Sweep (UT)	3	0.125	3.0	20	Door Weather Stripping - Singles (Units)	60.0	0.6	85.7	14.4	0.7	15.1	143.9	218.3	therms	kWh
Washington-Rose Elementary School	Door Weather Stripping	Single Door - Sweep (UT)	1	0.125	1.0	3	Door Weather Stripping - Singles (Units)	3.0	0.0	4.3	0.7	0.0	0.8	7.2	10.9	therms	kWh
Washington-Rose Elementary School	Door Weather Stripping	Install Door Jamb Spacer (UT)	3		3.0		Door - Install Jamb Spacer (Units)	-	-	-	-	-	-	-	-	therms	kWh

Roosevelt UFSD, NY
Exhibit D-5-8
ECM 8 - Pipe Insulation
Piping Insulation - Summary

CALCULATION SUMMARY

	Centennial Avenue Elementary School	Washington-Rose Elementary School	Ulysses Byas Elementary School	Roosevelt Middle School	Roosevelt High School
Include Heating Hot Water Pipe Insulation Savings	Y	Y	Y	Y	Y
Heating Hot Water Pipe Insulation Savings [Therms]	1,817	1,285	612	1,774	1,439
Safety Factor [%]	0%	0%	0%	0%	0%
Total Thermal Savings [Therms]	1,817	1,285	612	1,774	1,439

SAVINGS SUMMARY

Building ID	Thermal Savings	Thermal Safety Factor
	Therms	%
Centennial Avenue Elementary School	1,817	0.0%
Washington-Rose Elementary School	1,285	0.0%
Ulysses Byas Elementary School	612	0.0%
Roosevelt Middle School	1,774	0.0%
Roosevelt High School	1,439	0.0%
Subtotal	6,926	

Roosevelt UFSD, NY
Exhibit D-5-8
ECM 8 - 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/ft^2·°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 132.0

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

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

$q_{RAD-INS} = \sigma \cdot \varepsilon_{INS} \cdot (\pi \cdot D_{INS} \cdot L_{PIPE}) \cdot ((T_{INS} + 460)^4 - (T_{SURR} + 460)^4)$
$q_{RAD-BARE} = \sigma \cdot \varepsilon_{BARE} \cdot (\pi \cdot D_{BARE} \cdot L_{PIPE}) \cdot ((T_{BARE} + 460)^4 - (T_{SURR} + 460)^4)$
$T_{SURR} = (T_{FLOOR} + T_{CEILING} + 2 \cdot T_{WALL}) / 4$

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ECM 8 - 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

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CALCULATIONS

* Inputs are in blue

	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**
Centennial Avenue Elementary School	17.7	-	-	-	-	96.8	20.0	-	-	-	-	-	-
Washington-Rose Elementary School	-	-	-	-	35.8	58.0	38.2	-	-	-	-	-	-
Ulysses Byas Elementary School	-	-	-	-	4.0	44.4	10.0	-	-	-	-	-	-
Roosevelt Middle School	-	-	-	7.7	65.6	43.8	59.2	-	-	-	-	-	-
Roosevelt High School	-	-	-	23.1	-	76.4	25.0	28.5	-	-	-	-	-
Totals	**17.7**	-	-	**30.8**	**105.4**	**319.4**	**152.4**	**28.5**	-	-	-	-	-

	Centennial Avenue Elementary School	**Washington-Rose Elementary School**	**Ulysses Byas Elementary School**	**Roosevelt Middle School**	**Roosevelt High School**
Total Linear Feet of Insulation [ft]	134.5	132.0	58.4	176.3	153.0
Losses from Bare Pipe [BTU/hr]	48,500	39,642	17,218	54,500	44,576
Losses from Insulated Pipe [BTU/hr]	12,756	11,164	4,883	15,185	12,689
Proposed Boiler Efficiency [%]	79.0%	89.0%	81.0%	89.0%	89.0%
Thermal Savings [Therms/hr]	0.45	0.32	0.15	0.44	0.36
Safety Factor [%]	0%	0%	0%	0%	0%
Thermal Savings [Therms]	1,817	1,285	612	1,774	1,439

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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]	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
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 Fim 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]	16.000	12.750	10.625	8.625	7.563	6.500	5.500	4.875	4.375	3.900	3.315	3.050	2.840
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]	1.333	1.063	0.885	0.719	0.630	0.542	0.458	0.406	0.365	0.325	0.276	0.254	0.237
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]	114	113	113	112	111	111	110	109	109	108	106	105	104
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]	0.65	0.68	0.71	0.75	0.77	0.80	0.83	0.85	0.87	0.89	0.91	0.93	0.94
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]	148.98	125.19	108.83	92.67	83.72	74.44	65.34	59.43	54.56	49.78	43.64	40.74	38.36
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]	25	20	17	14	12	10	9	8	7	6	5	5	4
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]	174	145	126	106	96	85	74	67	61	56	49	46	43

INSULATION SURFACE TEMP. CALCULATION 14.0 inch pipe			
		1st Iteration Heat Loss [BTU/hr]	492
		1st Iteration Insulation Surface Temp. [°F]	141
		1st Iteration Film Coefficient [BTU/hr·ft^2·°F]	0.730
		2nd Iteration Heat Loss [BTU/hr]	271
NPS Pipe Size [in]	14.00	2nd Iteration Insulation Surface Temp. [°F]	159
Bare Pipe Surface Temp. [°F]	180	2nd Iteration Film Coefficient [BTU/hr·ft^2·°F]	0.771
Initial Film Coefficient [BTU/hr·ft^2·°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	283
Insulation Thickness [in]	1.0	3rd Iteration Insulation Surface Temp. [°F]	158
Insulation k-Factor [BTU/hr·ft^2·°F]	0.270	3rd Iteration Film Coefficient [BTU/hr·ft^2·°F]	0.769
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	283
External Pipe Diameter [in]	14.00	4th Iteration Insulation Surface Temp. [°F]	158
Insulation Surface Temp [°F]	**158**	4th Iteration Film Coefficient [BTU/hr·ft^2·°F]	0.769

INSULATION SURFACE TEMP. CALCULATION 2.5 inch pipe			
		1st Iteration Heat Loss [BTU/hr]	140
		1st Iteration Insulation Surface Temp. [°F]	136
		1st Iteration Film Coefficient [BTU/hr·ft^2·°F]	0.966
		2nd Iteration Heat Loss [BTU/hr]	98
NPS Pipe Size [in]	2.50	2nd Iteration Insulation Surface Temp. [°F]	150
Bare Pipe Surface Temp. [°F]	180	2nd Iteration Film Coefficient [BTU/hr·ft^2·°F]	1.010
Initial Film Coefficient [BTU/hr·ft^2·°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	101
Insulation Thickness [in]	1.0	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]	1.007
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	101
External Pipe Diameter [in]	2.875	4th Iteration Insulation Surface Temp. [°F]	149
Insulation Surface Temp [°F]	**149**	4th Iteration Film Coefficient [BTU/hr·ft^2·°F]	1.007

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INSULATION SURFACE TEMP. CALCULATION 10.0 inch pipe			
		1st Iteration Heat Loss [BTU/hr]	390
		1st Iteration Insulation Surface Temp. [°F]	141
		1st Iteration Film Coefficient [BTU/hr·ft²·°F]	0.771
		2nd Iteration Heat Loss [BTU/hr]	225
NPS Pipe Size [in]	10.00	2nd Iteration Insulation Surface Temp. [°F]	157
Bare Pipe Surface Temp. [°F]	180	2nd Iteration Film Coefficient [BTU/hr·ft²·°F]	0.813
Initial Film Coefficient [BTU/hr·ft²·°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	235
Insulation Thickness [in]	1.0	3rd Iteration Insulation Surface Temp. [°F]	156
Insulation k-Factor [BTU/hr·ft²·°F]	0.270	3rd Iteration Film Coefficient [BTU/hr·ft²·°F]	0.811
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	234
External Pipe Diameter [in]	10.75	4th Iteration Insulation Surface Temp. [°F]	156
Insulation Surface Temp [°F]	**156**	4th Iteration Film Coefficient [BTU/hr·ft²·°F]	0.811

INSULATION SURFACE TEMP. CALCULATION 8.0 inch pipe			
		1st Iteration Heat Loss [BTU/hr]	323
		1st Iteration Insulation Surface Temp. [°F]	140
		1st Iteration Film Coefficient [BTU/hr·ft²·°F]	0.806
		2nd Iteration Heat Loss [BTU/hr]	193
NPS Pipe Size [in]	8.00	2nd Iteration Insulation Surface Temp. [°F]	156
Bare Pipe Surface Temp. [°F]	180	2nd Iteration Film Coefficient [BTU/hr·ft²·°F]	0.848
Initial Film Coefficient [BTU/hr·ft²·°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	201
Insulation Thickness [in]	1.0	3rd Iteration Insulation Surface Temp. [°F]	155
Insulation k-Factor [BTU/hr·ft²·°F]	0.270	3rd Iteration Film Coefficient [BTU/hr·ft²·°F]	0.846
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	201
External Pipe Diameter [in]	8.625	4th Iteration Insulation Surface Temp. [°F]	155
Insulation Surface Temp [°F]	**155**	4th Iteration Film Coefficient [BTU/hr·ft²·°F]	0.846

INSULATION SURFACE TEMP. CALCULATION 6.0 inch pipe			
		1st Iteration Heat Loss [BTU/hr]	260
		1st Iteration Insulation Surface Temp. [°F]	140
		1st Iteration Film Coefficient [BTU/hr·ft²·°F]	0.847
		2nd Iteration Heat Loss [BTU/hr]	162
NPS Pipe Size [in]	6.00	2nd Iteration Insulation Surface Temp. [°F]	155
Bare Pipe Surface Temp. [°F]	180	2nd Iteration Film Coefficient [BTU/hr·ft²·°F]	0.890
Initial Film Coefficient [BTU/hr·ft²·°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	168
Insulation Thickness [in]	1.0	3rd Iteration Insulation Surface Temp. [°F]	154
Insulation k-Factor [BTU/hr·ft²·°F]	0.270	3rd Iteration Film Coefficient [BTU/hr·ft²·°F]	0.887
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	168
External Pipe Diameter [in]	6.625	4th Iteration Insulation Surface Temp. [°F]	154
Insulation Surface Temp [°F]	**154**	4th Iteration Film Coefficient [BTU/hr·ft²·°F]	0.887

INSULATION SURFACE TEMP. CALCULATION 2.0 inch pipe			
		1st Iteration Heat Loss [BTU/hr]	124
		1st Iteration Insulation Surface Temp. [°F]	135
		1st Iteration Film Coefficient [BTU/hr·ft²·°F]	0.988
		2nd Iteration Heat Loss [BTU/hr]	88
NPS Pipe Size [in]	2.00	2nd Iteration Insulation Surface Temp. [°F]	148
Bare Pipe Surface Temp. [°F]	180	2nd Iteration Film Coefficient [BTU/hr·ft²·°F]	1.033
Initial Film Coefficient [BTU/hr·ft²·°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	91
Insulation Thickness [in]	1.0	3rd Iteration Insulation Surface Temp. [°F]	147
Insulation k-Factor [BTU/hr·ft²·°F]	0.270	3rd Iteration Film Coefficient [BTU/hr·ft²·°F]	1.030
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	91
External Pipe Diameter [in]	2.375	4th Iteration Insulation Surface Temp. [°F]	147
Insulation Surface Temp [°F]	**147**	4th Iteration Film Coefficient [BTU/hr·ft²·°F]	1.030

INSULATION SURFACE TEMP. CALCULATION 1.5 inch pipe			
		1st Iteration Heat Loss [BTU/hr]	108
		1st Iteration Insulation Surface Temp. [°F]	134
		1st Iteration Film Coefficient [BTU/hr·ft²·°F]	1.012
		2nd Iteration Heat Loss [BTU/hr]	79
NPS Pipe Size [in]	1.50	2nd Iteration Insulation Surface Temp. [°F]	146
Bare Pipe Surface Temp. [°F]	180	2nd Iteration Film Coefficient [BTU/hr·ft²·°F]	1.058
Initial Film Coefficient [BTU/hr·ft²·°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	82
Insulation Thickness [in]	1.0	3rd Iteration Insulation Surface Temp. [°F]	145
Insulation k-Factor [BTU/hr·ft²·°F]	0.270	3rd Iteration Film Coefficient [BTU/hr·ft²·°F]	1.054
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	81
External Pipe Diameter [in]	1.9	4th Iteration Insulation Surface Temp. [°F]	146
Insulation Surface Temp [°F]	**146**	4th Iteration Film Coefficient [BTU/hr·ft²·°F]	1.054

INSULATION SURFACE TEMP. CALCULATION 1.0 inch pipe			
		1st Iteration Heat Loss [BTU/hr]	89
		1st Iteration Insulation Surface Temp. [°F]	132
		1st Iteration Film Coefficient [BTU/hr·ft²·°F]	1.044
		2nd Iteration Heat Loss [BTU/hr]	67
NPS Pipe Size [in]	1.00	2nd Iteration Insulation Surface Temp. [°F]	144
Bare Pipe Surface Temp. [°F]	180	2nd Iteration Film Coefficient [BTU/hr·ft²·°F]	1.091
Initial Film Coefficient [BTU/hr·ft²·°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	69
Insulation Thickness [in]	1.0	3rd Iteration Insulation Surface Temp. [°F]	143
Insulation k-Factor [BTU/hr·ft²·°F]	0.270	3rd Iteration Film Coefficient [BTU/hr·ft²·°F]	1.087
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	69
External Pipe Diameter [in]	1.315	4th Iteration Insulation Surface Temp. [°F]	143
Insulation Surface Temp [°F]	**143**	4th Iteration Film Coefficient [BTU/hr·ft²·°F]	1.087

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INSULATION SURFACE TEMP. CALCULATION 5.0 inch pipe			
		1st Iteration Heat Loss [BTU/hr]	226
		1st Iteration Insulation Surface Temp. [°F]	139
		1st Iteration Film Coefficient [BTU/hr·ft²·°F]	0.874
		2nd Iteration Heat Loss [BTU/hr]	145
NPS Pipe Size [in]	5.00	2nd Iteration Insulation Surface Temp. [°F]	154
Bare Pipe Surface Temp. [°F]	180	2nd Iteration Film Coefficient [BTU/hr·ft²·°F]	0.917
Initial Film Coefficient [BTU/hr·ft²·°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	150
Insulation Thickness [in]	1.0	3rd Iteration Insulation Surface Temp. [°F]	153
Insulation k-Factor [BTU/hr·ft²·°F]	0.270	3rd Iteration Film Coefficient [BTU/hr·ft²·°F]	0.914
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	150
External Pipe Diameter [in]	5.563	4th Iteration Insulation Surface Temp. [°F]	153
Insulation Surface Temp [°F]	**153**	4th Iteration Film Coefficient [BTU/hr·ft²·°F]	0.914

INSULATION SURFACE TEMP. CALCULATION 4.0 inch pipe			
		1st Iteration Heat Loss [BTU/hr]	192
		1st Iteration Insulation Surface Temp. [°F]	138
		1st Iteration Film Coefficient [BTU/hr·ft²·°F]	0.905
		2nd Iteration Heat Loss [BTU/hr]	127
NPS Pipe Size [in]	4.00	2nd Iteration Insulation Surface Temp. [°F]	152
Bare Pipe Surface Temp. [°F]	180	2nd Iteration Film Coefficient [BTU/hr·ft²·°F]	0.948
Initial Film Coefficient [BTU/hr·ft²·°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	132
Insulation Thickness [in]	1.0	3rd Iteration Insulation Surface Temp. [°F]	151
Insulation k-Factor [BTU/hr·ft²·°F]	0.270	3rd Iteration Film Coefficient [BTU/hr·ft²·°F]	0.946
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	131
External Pipe Diameter [in]	4.5	4th Iteration Insulation Surface Temp. [°F]	152
Insulation Surface Temp [°F]	**152**	4th Iteration Film Coefficient [BTU/hr·ft²·°F]	0.946

INSULATION SURFACE TEMP. CALCULATION 3.0 inch pipe			
		1st Iteration Heat Loss [BTU/hr]	160
		1st Iteration Insulation Surface Temp. [°F]	137
		1st Iteration Film Coefficient [BTU/hr·ft²·°F]	0.940
		2nd Iteration Heat Loss [BTU/hr]	109
NPS Pipe Size [in]	3.00	2nd Iteration Insulation Surface Temp. [°F]	151
Bare Pipe Surface Temp. [°F]	180	2nd Iteration Film Coefficient [BTU/hr·ft²·°F]	0.984
Initial Film Coefficient [BTU/hr·ft²·°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	113
Insulation Thickness [in]	1.0	3rd Iteration Insulation Surface Temp. [°F]	150
Insulation k-Factor [BTU/hr·ft²·°F]	0.270	3rd Iteration Film Coefficient [BTU/hr·ft²·°F]	0.981
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	113
External Pipe Diameter [in]	3.5	4th Iteration Insulation Surface Temp. [°F]	150
Insulation Surface Temp [°F]	**150**	4th Iteration Film Coefficient [BTU/hr·ft²·°F]	0.981

INSULATION SURFACE TEMP. CALCULATION 0.75 inch pipe			
		1st Iteration Heat Loss [BTU/hr]	79
		1st Iteration Insulation Surface Temp. [°F]	130
		1st Iteration Film Coefficient [BTU/hr·ft²·°F]	1.059
		2nd Iteration Heat Loss [BTU/hr]	61
NPS Pipe Size [in]	0.75	2nd Iteration Insulation Surface Temp. [°F]	142
Bare Pipe Surface Temp. [°F]	180	2nd Iteration Film Coefficient [BTU/hr·ft²·°F]	1.107
Initial Film Coefficient [BTU/hr·ft²·°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	63
Insulation Thickness [in]	1.0	3rd Iteration Insulation Surface Temp. [°F]	141
Insulation k-Factor [BTU/hr·ft²·°F]	0.270	3rd Iteration Film Coefficient [BTU/hr·ft²·°F]	1.103
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	62
External Pipe Diameter [in]	1.05	4th Iteration Insulation Surface Temp. [°F]	141
Insulation Surface Temp [°F]	**141**	4th Iteration Film Coefficient [BTU/hr·ft²·°F]	1.103

INSULATION SURFACE TEMP. CALCULATION 0.5 inch pipe			
		1st Iteration Heat Loss [BTU/hr]	**72**
		1st Iteration Insulation Surface Temp. [°F]	**128**
		1st Iteration Film Coefficient [BTU/hr·ft²·°F]	**1.070**
		2nd Iteration Heat Loss [BTU/hr]	**56**
NPS Pipe Size [in]	0.50	2nd Iteration Insulation Surface Temp. [°F]	**140**
Bare Pipe Surface Temp. [°F]	180	2nd Iteration Film Coefficient [BTU/hr·ft²·°F]	**1.120**
Initial Film Coefficient [BTU/hr·ft²·°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	**57**
Insulation Thickness [in]	1.0	3rd Iteration Insulation Surface Temp. [°F]	**139**
Insulation k-Factor [BTU/hr·ft²·°F]	0.270	3rd Iteration Film Coefficient [BTU/hr·ft²·°F]	**1.115**
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	**57**
External Pipe Diameter [in]	0.84	4th Iteration Insulation Surface Temp. [°F]	**139**
Insulation Surface Temp [°F]	**139**	4th Iteration Film Coefficient [BTU/hr·ft²·°F]	**1.115**

Roosevelt UFSD, NY
Exhibit D-5-9
ECM 9 - Install Walk-In Freezer/Coolers Controllers

ECM DESCRIPTION

Install refrigeration controllers (or equivalent) on walk-in freezers and coolers. This will reduce compressor cycling and improve operating efficiency.

DATA / ASSUMPTIONS

Anti-sweat door heaters and existing evaporator fan motors run continuously.

COMMISSIONING

Test compressors after installation.

RECOVERY/SAFETY FACTOR

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

FORMULAE

Existing Compressor Energy Use

$C_E = C_{kW\text{-}T} \cdot [(C_{DC\text{-}W} \cdot Bin_{Econ}) + (C_{DC\text{-}S} \cdot Bin_{Econ\text{-}Off})]$

Evaporator Fan Set Analysis

$EvapFan_{Savings} = (EvapFan_{Cycle}) + (EvapFan_{Cycle} \cdot (3413/12000) \cdot 1.6) - (H_{operating} \cdot L_{total}) - [(H_{operating} \cdot L_{total}) \cdot (3413/12000) \cdot 1.6)]$

$EvapFan_{Savings2} = (kW_{Evap} \cdot (8760 - H_{evap\text{-}off}) \cdot t_{controller\text{-}run\%}$

Compressor Savings

$C_S = C_E \cdot t_{controller\text{-}run\%}$

ECM Motor Savings

$C_S = C_E \cdot t_{controller\text{-}run\%}$

$W_{MotorSavings} = H_{CoolTrol} \cdot kW_{Evap} \cdot L_{reduction}$

$W_{ReducedCoolingLoad} = W_{MotorSavings} \cdot 0.28 \cdot 1.6$

Door Heater Savings

$DH_{SavingsCooler} = (kW_{DH} \cdot 8760) - (kW_{DH} \cdot H_{DH} \cdot L_{PowerLevel})$

$DH_{SavingsFreezer} = (kW_{DH} \cdot 8760) - (40\% \cdot kW_{DH} \cdot 4000 + kW_{DH} \cdot 4760 \cdot L_{PowerLevel})$

Roosevelt UFSD, NY
Exhibit D-5-9
ECM 9 - Install Walk-In Freezer/Coolers Controllers

Variable	Units	Description
C_E	kWh/Yr	Compressor energy usage per year
C_{kW-T}	kW	Total compressor load affected by economisers
C_{DC-W}	%	Compressor duty cycle - winter months
Bin_{Econ}	Hours	Bin Hours - Economiser
C_{DC-S}	%	Compressor duty cycle - non winter months
$Bin_{Econ-Off}$	Hours	Economiser off hours per year
$EvapFan_{Savings}$	kWh/Yr	Cycling evaporator fan net energy savings per year
$EvapFan_{Cycle}$	kWh/Yr	Cycling evaporator fan energy savings per year
$H_{operating}$	Hours	Operating Hours
L_{total}	-	Total load of installed fans
C_S	kWh/Yr	Compressor energy savngs per year
$t_{controller-run\%}$	%	Controller reduction in run time
$EvapFan_{Savings2}$	kWh/Yr	Evaporator savings per year
kW_{Evap}	kW	Total kW of all evaporator fans
$H_{evap-off}$	Hours	Evaporator fan off time
$W_{MotorSavings}$	kWh / Yr	Electrical Savings for Motor Replacement
$H_{CoolTrol}$	Hours	Evaporator Fan On Time
$L_{reduction}$	%	Reduction in motor load
$W_{ReductedCoolingLoa}$	kWh / Yr	Electrical Savings for Motor Replacement
$DH_{SavingsCooler}$	kWh / Yr	Cooler door heater savings
kW_{DH}	kW	Door Heater kW
H_{DH}	Hours	Door heater run hours
$L_{PowerLevel}$	%	Power level of door heaters

*Inputs are blue

		Compressor Data					Condenser Fan Data				
Building	Equipment Label	Amps [A]	Voltage [V]	Phase	Power Factor	Power Load [kW]	Amps [A]	Voltage [V]	Phase	Power Factor	Power Load [kW]
Centennial Avenue Elementary School	Cooler 1	5.9	208	3	0.85	1.81	0.9	230	1	0.85	0.18
Centennial Avenue Elementary School	Freezer 1	7.4	208	3	0.85	2.27	1.7	230	1	0.85	0.33
Washington-Rose Elementary School	Cooler 1	5.4	208	3	0.85	1.65	0.9	230	1	0.85	0.18
Washington-Rose Elementary School	Freezer 1	9.9	208	3	0.85	3.03	1.7	230	1	0.85	0.33
Ulysses Byas Elementary School	Cooler 1	5.9	208	3	0.85	1.81	0.9	230	1	0.85	0.18
Ulysses Byas Elementary School	Freezer 1	9.9	208	3	0.85	3.03	1.7	230	1	0.85	0.33
Roosevelt Middle School	Cooler 1	5.4	208	3	0.85	1.65	0.9	230	1	0.85	0.18
Roosevelt Middle School	Freezer 1	9.9	208	3	0.85	3.03	1.7	230	1	0.85	0.33
Roosevelt High School	Cooler 1	5.4	208	3	0.85	1.65	0.9	230	1	0.85	0.18
Roosevelt High School	Freezer 1	7.4	208	3	0.85	2.27	1.7	230	1	0.85	0.33
Roosevelt High School	Cooler 1	3.0	208	3	0.85	0.92	0.9	230	1	0.85	0.18
Roosevelt High School	Freezer 1	6.6	208	3	0.85	2.02	1.7	230	1	0.85	0.33
Totals						**25.14**					**3.05**

		Evaporator Fan Data						Door Heater Data						
Building	Equipment Label	Fan Count	Amps [A]	Voltage [V]	Phase	Power Factor	Power Load [kW]	Door Count	Heater Type	Amps [A]	Voltage [V]	Phase	Power Factor	Power Load [kW]
Centennial Avenue Elementary School	Cooler 1	2	0.9	115	1	0.55	0.11	-	Cooler	-	120	1	1.00	-
Centennial Avenue Elementary School	Freezer 1	2	0.6	230	1	0.55	0.15	1	Freezer	2.2	120	1	1.00	0.269
Washington-Rose Elementary School	Cooler 1	2	2.0	115	1	0.55	0.25	1	Cooler	2.2	120	1	1.00	0.269
Washington-Rose Elementary School	Freezer 1	2	1.0	230	1	0.55	0.25	1	Freezer	2.2	120	1	1.00	0.27
Ulysses Byas Elementary School	Cooler 1	2	2.0	115	1	0.55	0.25	1	Cooler	2.2	120	1	1.00	0.27
Ulysses Byas Elementary School	Freezer 1	2	1.0	230	1	0.55	0.25	1	Freezer	2.2	120	1	1.00	0.27
Roosevelt Middle School	Cooler 1	2	2.0	115	1	0.55	0.25	1	Cooler	2.2	120	1	1.00	0.27
Roosevelt Middle School	Freezer 1	2	1.0	230	1	0.55	0.25	1	Freezer	2.2	120	1	1.00	0.27
Roosevelt High School	Cooler 1	2	0.9	115	1	0.55	0.11	-	Cooler	-	120	1	1.00	-
Roosevelt High School	Freezer 1	2	1.0	230	1	0.55	0.25	1	Freezer	2.2	120	1	1.00	0.27
Roosevelt High School	Cooler 1	2	0.9	115	1	0.55	0.11	-	Cooler	-	120	1	1.00	-
Roosevelt High School	Freezer 1	2	0.5	230	1	0.55	0.11	-	Freezer	-	120	1	1.00	-
Totals		**24**					**2.38**	**8**						**2.15**

Roosevelt UFSD, NY
Exhibit D-5-9
ECM 9 - Install Walk-In Freezer/Coolers Controllers

CALCULATIONS

EVAPORATOR FAN CONTROLS

	Centennial Avenue Elementary School	Centennial Avenue Elementary School	Washington-Rose Elementary School	Washington-Rose Elementary School	Ulysses Byas Elementary School	Ulysses Byas Elementary School	Roosevelt Middle School	Roosevelt Middle School	Roosevelt High School	Roosevelt High School	Roosevelt High School	Roosevelt High School
Equipment Label	Cooler 1	Freezer 1	Cooler 1	Freezer 1	Cooler 1	Freezer 1	Cooler 1	Freezer 1	Cooler 1	Freezer 1	Cooler 1	Freezer 1
Include Comp. and Cond. Fan Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Comp. and Cond. Fan Load [kW]	1.98	2.60	1.83	3.36	1.98	3.36	1.83	3.36	1.83	2.60	1.09	2.35
Winter Comp. Duty Cycle [%]	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%
Summer Comp. Duty Cycle [%]	52%	52%	52%	52%	52%	52%	52%	52%	52%	52%	52%	52%
Adjusted Avg. Winter Comp. and Cond. Fan Load [kW]	0.59	0.78	0.55	1.01	0.59	1.01	0.55	1.01	0.55	0.78	0.33	0.71
Adjusted Avg. Summer Comp. and Cond. Fan Load [kW]	1.03	1.35	0.95	1.75	1.03	1.75	0.95	1.75	0.95	1.35	0.57	1.22
Winter Run Time [hr]	1,715	1,715	1,715	1,715	1,715	1,715	1,715	1,715	1,715	1,715	1,715	1,715
Summer Run Time [hr]	7,045	7,045	7,045	7,045	7,045	7,045	7,045	7,045	7,045	7,045	7,045	7,045
Comp. and Cond. Fan Annual Energy Consumption [kWh]	8,283	10,856	7,644	14,054	8,283	14,054	7,644	14,054	7,644	10,856	4,573	9,832
Reduction in Run Time with Controls [%]	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	10%	10%
Comp. and Cond. Fan Savings from Controls [kWh]	414	543	382	703	414	703	382	703	382	543	457	983
Resulting Evap. Fan Savings from Controls [kWh]	-	-	61	61	61	61	61	61	28	61	55	55
Total Savings with Controls [kWh]	414	543	443	764	475	764	443	764	410	604	513	1,038

CYCLING EVAPORATOR FANS

Include Cycling Evap. Fans	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Existing Evap. Fan Motor Load [kW]	0.1139	0.1518	0.2530	0.2530	0.25	0.25	0.25	0.25	0.11	0.25	0.11	0.11
Existing Evap. Fan Run Time [hr]	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760
Average Compressor Run Time [%]	48%	48%	48%	48%	48%	48%	48%	48%	48%	48%	48%	48%
Proposed Annual Compressor Run Time [hr]	4,178	4,178	4,178	4,178	4,178	4,178	4,178	4,178	4,178	4,178	4,178	4,178
Proposed Evap. Fan Off Time [hr]	3,914	3,914	3,914	3,914	3,914	3,914	3,914	3,914	3,914	3,914	3,914	3,914
Savings from Evap. Fan Cycling [kWh]	446	594	990	990	990	990	990	990	446	990	446	446
Savings from Reduced Evap. Fan Cooling Load [kWh]	203	270	451	451	451	451	451	451	203	451	203	203
Total Savings from Cycling Evap. Fans [kWh]	648	864	1,441	1,441	1,441	1,441	1,441	1,441	648	1,441	648	648

Direct Digital Termperature Controls

Comp. and Cond. Fan Annual Energy Consumption [kWh]	8,283	10,856	7,644	14,054	8,283	14,054	7,644	14,054	7,644	10,856	4,573	9,832
Reduction in Usage [%]	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Compressor Savings [kWh]	414	543	382	703	414	703	382	703	382	543	229	492

ECM EVAPORATOR FAN MOTORS

Include ECM Evap. Fan Motors	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Existing Evap. Fan Motor Load [kW]	-	-	0.25	0.25	0.25	0.25	0.25	0.25	0.11	0.25	0.11	0.11
Reduction in Evap. Fan Motor Load with ECM Motors [%]	65%	65%	65%	65%	65%	65%	65%	65%	65%	65%	65%	65%
Proposed Evap. Fan Run Time [hr]	4,730	4,730	4,730	4,730	4,730	4,730	4,730	4,730	4,730	4,730	4,730	4,730
Evap. Fan Motor Load Savings [kW]	-	-	0.16	0.16	0.16	0.16	0.16	0.16	0.07	0.16	0.07	0.07
Evap. Fan Motor Consumption Savings [kWh]	-	-	778	778	778	778	778	778	350	778	350	350
Reduced Cooling Load from Evap. Fans [kWh]	-	-	354	354	354	354	354	354	159	354	159	159
Total Savings from ECM Evap. Fan Motors [kWh]	-	-	1,132	1,132	1,132	1,132	1,132	1,132	509	1,132	509	509
Total Savings from ECM Evap. Fan Motors [kW]	-	-	0.239	0.239	0.239	0.24	0.24	0.24	0.11	0.24	0.11	0.11

Roosevelt UFSD, NY
Exhibit D-5-9
ECM 9 - Install Walk-In Freezer/Coolers Controllers

Controlling Electric Defrost

Total Load From Electric Defrost [kW]	-	1.6	-	1.6	-	1.6	-	1.6	-	2.0	-	1.6
Annual Electric Defrost Energy Use [kWh]	-	1,567	-	1,567	-		-	1,567	-	1,948	-	1,567
Estimated Hours that Electrc Defrost can be shut off [hr]	341	341	341	341	341	341	341	341	341	341	341	341
Estimated Savings from Defrost Reduction [kWh]	-	548	-	548	-	548	-	548	-	681.67	-	548
Savings due to reduced cooling load [kWh]	-	246	-	246	-	246	-	246	-	305.39	-	246
Total Savings [kWh]	-	794	-	794	-	794	-	794	-	987.06	-	794

DOOR HEATER CONTROLS

Include Door Heater Controls	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Equipment Type	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer
Existing Door Heater Load [kW]	-	0.27	0.27	0.27	0.27	0.27	0.27	0.27	-	0.27	-	-
Existing Door Heater Annual Energy Consumption [kWh]	-	2,355	2,355	2,355	2,355	2,355	2,355	2,355	-	2,355	-	-
Estimated Run Hours with Controls [hrs]	3,760	3,760	3,760	3,760	3,760	3,760	3,760	3,760	3,760	3,760	8,760	8,760
Estimated Avg. Door Heater Power Level with Controls [%]	65%	65%	60%	65%	65%	65%	65%	65%	65%	65%	65%	65%
Proposed Door Heater Consumption with Controls [kWh]	-	1,262	606	1,262	657	1,262	657	1,262	-	1,262	-	-
Total Savings from Door Heater Controls [kWh]	-	1,093	1,748	1,093	1,698	1,093	1,698	1,093	-	1,093	-	-

CALCULATION SUMMARY

Total Savings with Evap. Fan Controls [kWh]	414	543	443	764	475	764	443	764	410	604	513	1,038
Total Savings from ECM Evap. Fan Motors [kWh]	-	-	1,132	1,132	1,132	1,132	1,132	1,132	509	1,132	509	509
Total Savings from Cycling Evap. Fans [kWh]	648	864	1,441	1,441	1,441	1,441	1,441	1,441	648	1,441	648	648
Total Savings from Direct Digital Controls [kWh]	414	543	382	703	414	703	382	703	382	543	229	492
Total Savings from Defrost Control [kWh]	-	794	-	794	-	794	-	794	-	987	-	794
Total Savings from Door Heater Controls [kWh]	-	1,093	1,748	1,093	1,698	1,093	1,698	1,093	-	1,093	-	-
Quantity [#]	1	1	1	1	1	1	1	1	1	1	1	1
Electric Safety Factor [%]	0%	23%	11%	9%	10%	9%	10%	9%	0%	34%	0%	57%
Total Savings [kWh]	1,477	2,938	4,601	5,380	4,626	5,391	4,575	5,405	1,950	3,820	1,899	1,502
Total Savings [kW]	-	-	0.24	0.24	0.24	0.24	0.24	0.24	0.11	0.24	0.11	0.11

Roosevelt UFSD, NY
Exhibit D-5-9
ECM 9 - Install Walk-In Freezer/Coolers Controllers

SAVINGS SUMMARY

Building ID	kWh Savings	kW Savings
	kWh	kW
Centennial Avenue Elementary School	4,415	-
Washington-Rose Elementary School	9,981	0.48
Ulysses Byas Elementary School	10,017	0.48
Roosevelt Middle School	9,980	0.48
Roosevelt High School	9,170	0.56
Subtotal	43,564	

Roosevelt UFSD, NY
Exhibit D-5-10
ECM 10 - Install Solar PV System

ECM DESCRIPTION

Install solar photovoltaic systems to generate clean, renewable energy.

DATA / ASSUMPTIONS

Demand Diversity Factor [%] = **100%**
*Savings modeled using Helioscope software

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 [%] = **0%**

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)

* Inputs are in blue

Building	DC Rating of System [kW]	Include System [Y/N]	System Type
Centennial Avenue Elementary School	442.7	Y	Roof Mount & Car Port
Washington-Rose Elementary School	179.5	Y	Roof Mount
Ulysses Byas Elementary School	210.5	Y	Roof Mount
Roosevelt Middle School	1,557.6	Y	Roof Mount & Car Port
Roosevelt High School	905.3	Y	Roof Mount & Car Port
Totals	3,295.6		

Roosevelt UFSD, NY
Exhibit D-5-10
ECM 10 - Install Solar PV System

CALCULATIONS

	Centennial Avenue Elementary School	Washington-Rose Elementary School	Ulysses Byas Elementary School	Roosevelt Middle School	Roosevelt High School
DC Rating of System [kW]	442.7	179.5	210.5	1,557.6	905.3
Include System [Y/N]	Y	Y	Y	Y	Y
Total kWh AC per year Generated [kWh]	590,184	244,865	281,135	2,002,011	1,240,214
Electric Safety Factor [%]	0%	0%	0%	0%	0%
Baseline Electric Consumption [kWh]	1,051,200	1,139,200	861,920	2,495,040	2,037,280
Savings from Non-Solar PV ECMs [kWh]	200,787	249,103	157,495	377,353	407,137
Adjusted Baseline Consumption [kWh]	850,413	890,097	704,425	2,117,687	1,630,143
Excess Solar PV Production [Y/N]	N	N	N	N	N
Annual Excess Production [kWh]	-	-	-	-	-
Host Site Remaining Electric Cost after EPC [$]	$ 101,411	$ 154,381	$ 112,063	$ 118,828	$ 158,653
Electric Consumption Savings [kWh]	590,184	244,865	281,135	2,002,011	1,240,214

Building Centennial Avenue Elementary School
Type: Roof Mount & Car Port

Month	Solar PV System Production [kWh]	Days per Month	Solar Radiation [kWh/m^2]
January	28,383	31	73.7
February	35,315	28	89.9
March	55,040	31	140.8
April	59,577	30	156.5
May	65,803	31	176.0
June	68,816	30	185.9
July	71,192	31	193.6
August	62,713	31	171.1
September	49,876	30	134.4
October	40,609	31	107.4
November	28,673	30	75.3
December	24,186	31	63.6

Building Washington-Rose Elementary School
Type: Roof Mount

Month	Solar PV System Production [kWh]	Days per Month	Solar Radiation [kWh/m^2]
January	12,236	31	78.6
February	15,021	28	94.2
March	22,980	31	145.2
April	24,592	30	158.8
May	26,954	31	176.9
June	28,049	30	186.4
July	28,917	31	194.5
August	25,600	31	173.2
September	20,610	30	137.6
October	17,137	31	111.9
November	12,296	30	79.7
December	10,473	31	68.1

Roosevelt UFSD, NY
Exhibit D-5-10
ECM 10 - Install Solar PV System

Building Ulysses Byas Elementary School
Type: Roof Mount

Month	Solar PV System Production [kWh]	Days per Month	Solar Radiation [kWh/m^2]
January	14,317	31	78.6
February	17,565	28	94.1
March	26,276	31	145.1
April	27,581	30	158.7
May	30,296	31	176.9
June	31,727	30	186.4
July	33,125	31	194.5
August	29,576	31	173.2
September	23,989	30	137.5
October	20,082	31	111.8
November	14,398	30	79.6
December	12,202	31	68.1

Building Roosevelt Middle School
Type: Roof Mount & Car Port

Month	Solar PV System Production [kWh]	Days per Month	Solar Radiation [kWh/m^2]
January	92,158	31	68.8
February	117,202	28	85.4
March	185,695	31	136.3
April	203,026	30	153.8
May	226,082	31	174.5
June	237,485	30	185.0
July	246,213	31	192.2
August	216,156	31	168.6
September	170,223	30	130.9
October	135,930	31	102.8
November	93,945	30	70.8
December	77,894	31	58.9

Building Roosevelt High School
Type: Roof Mount & Car Port

Month	Solar PV System Production [kWh]	Days per Month	Solar Radiation [kWh/m^2]
January	61,103	31	76.1
February	75,580	28	92.0
March	115,833	31	142.9
April	123,768	30	157.7
May	136,262	31	176.4
June	142,597	30	186.2
July	148,205	31	194.1
August	131,226	31	172.0
September	105,222	30	136.0
October	86,598	31	109.5
November	61,609	30	77.4
December	52,211	31	65.7

Roosevelt UFSD, NY
Exhibit D-5-10
ECM 10 - Install Solar PV System

SAVINGS SUMMARY

Building ID	kWh Savings	kW Savings	Electric Safety Factor
	kWh	kW	%
Centennial Avenue Elementary School	590,184	-	0.0%
Washington-Rose Elementary School	244,865	-	0.0%
Ulysses Byas Elementary School	281,135	-	0.0%
Roosevelt Middle School	2,002,011	-	0.0%
Roosevelt High School	1,240,214	-	0.0%
Subtotal	4,358,407	-	

Roosevelt UFSD, NY
Exhibit D-5-10
ECM 10 - Install Solar PV System
Solar PV Balance

ECM DESCRIPTION

Install solar photovoltaic systems to generate clean, renewable energy.

CALCULATIONS

DEMAND kW						
Month	Centennial Avenue Elementary School	Washington-Rose Elementary School	Ulysses Byas Elementary School	Roosevelt Middle School	Roosevelt High School	TOTAL
July	413.9	423.0	254.1	604.6	545.3	2,240.9
August	366.4	391.2	248.8	637.0	546.9	2,190.3
September	304.3	160.3	178.2	335.2	371.2	1,349.2
October	180.8	173.4	177.0	322.7	371.2	1,225.1
November	195.4	150.4	183.4	320.8	390.1	1,240.1
December	193.6	174.9	175.2	335.7	378.2	1,257.6
January	189.9	178.9	176.5	341.9	562.7	1,449.9
February	190.1	170.1	209.1	338.4	534.6	1,442.3
March	321.1	371.2	208.5	460.5	534.6	1,895.9
April	343.0	281.9	335.8	597.6	585.8	2,144.1
May	337.0	290.6	356.6	576.0	560.6	2,120.8
June	326.9	295.7	252.6	562.4	565.1	2,002.7
Baseline kW	3,362.4	3,061.6	2,755.8	5,432.8	5,946.3	20,558.9
Non-Solar ECM kW Savings	577.3	461.7	634.5	1,006.9	1,132.7	3,813.2
Adj. Baseline kW	2,785.1	2,599.9	2,121.3	4,425.9	4,813.6	16,745.7
Lowest Monthly Baseline kW	180.8	150.4	175.2	320.8	371.2	1,225.1
Proposed Monthly Lighting kW	7.6	8.9	4.6	10.5	10.2	41.9
Monthly Solar PV Savings kW	-	-	-	-	-	-
Monthly Balance Post Solar PV kW	180.8	150.4	175.2	320.8	371.2	1,198.4
Demand Balance Satisfied	Y	Y	Y	Y	Y	Y
Annual Solar PV Savings kW	-	-	-	-	-	-
% of Adj. Baseline	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Roosevelt UFSD, NY
Exhibit D-5-10
ECM 10 - Install Solar PV System
Solar PV Balance

CONSUMPTION kWh						
Month	Centennial Avenue Elementary School	Washington-Rose Elementary School	Ulysses Byas Elementary School	Roosevelt Middle School	Roosevelt High School	TOTAL
July	120,480	132,160	76,640	286,880	217,600	833,760
August	101,920	129,440	63,040	252,000	162,560	708,960
September	73,760	57,440	48,960	145,440	155,360	480,960
October	73,920	95,840	67,200	168,480	166,400	571,840
November	73,760	48,320	63,840	154,400	148,160	488,480
December	71,840	83,360	67,040	184,960	168,640	575,840
January	79,040	63,360	70,560	170,240	132,480	515,680
February	72,800	70,080	64,800	178,880	159,200	545,760
March	67,200	46,720	72,320	176,000	139,840	502,080
April	89,120	124,960	94,400	244,000	184,480	736,960
May	120,000	143,840	96,480	267,360	208,800	836,480
June	107,360	143,680	76,640	266,400	193,760	787,840
Baseline kWh	1,051,200	1,139,200	861,920	2,495,040	2,037,280	7,584,640
Non-Solar ECM kWh Savings	200,787	249,103	157,495	377,353	407,137	1,391,876
Adj. Baseline kWh	850,413	890,097	704,425	2,117,687	1,630,143	6,192,764
Solar PV Savings kWh	590,184	244,865	281,135	2,002,011	1,240,214	4,358,407
% of Adj. Baseline	69.4%	27.5%	39.9%	94.5%	76.1%	70.4%

TOTAL ELECTRIC COST						
Month	Centennial Avenue Elementary School	Washington-Rose Elementary School	Ulysses Byas Elementary School	Roosevelt Middle School	Roosevelt High School	TOTAL
July	$ 35,579	$ 37,453	$ 23,402	$ 71,918	$ 59,197	$ 227,549
August	$ 25,990	$ 30,164	$ 12,533	$ 49,159	$ 33,132	$ 150,977
September	$ 14,154	$ 10,249	$ 9,257	$ 25,056	$ 26,770	$ 85,486
October	$ 13,412	$ 16,963	$ 12,494	$ 29,234	$ 29,274	$ 101,377
November	$ 13,302	$ 8,355	$ 11,244	$ 25,957	$ 25,477	$ 84,335
December	$ 12,056	$ 13,705	$ 10,837	$ 28,657	$ 26,708	$ 91,964
January	$ 13,189	$ 10,464	$ 12,104	$ 27,582	$ 23,482	$ 86,821
February	$ 12,371	$ 11,756	$ 11,161	$ 28,710	$ 27,595	$ 91,594
March	$ 12,193	$ 8,665	$ 12,096	$ 28,604	$ 24,056	$ 85,613
April	$ 19,606	$ 25,013	$ 26,181	$ 53,857	$ 44,941	$ 169,598
May	$ 30,472	$ 31,687	$ 26,523	$ 60,313	$ 51,240	$ 200,234
June	$ 26,785	$ 31,516	$ 19,648	$ 57,856	$ 47,872	$ 183,677
Baseline Total Cost	$ 229,108	$ 235,989	$ 187,479	$ 486,905	$ 419,744	$ 1,559,224
All ECM Total $ Savings	$ 127,696	$ 81,607	$ 75,416	$ 368,077	$ 261,091	$ 913,887
Adj. Baseline Total Cost	$ 101,411	$ 154,381	$ 112,063	$ 118,828	$ 158,653	$ 645,337
Excess Solar Export $ Credit	$ -		$ -	$ -	$ -	$ -
% of Adj. Baseline	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

EXHIBIT D-6
OPERATIONAL COST AVOIDANCE CALCULATIONS

OSD #1: LIGHTING O&M OPERATIONAL COST AVOIDANCE

1. **Description and Causal Connection to Scope of Work:** Attachment A, section A1 describes Honeywell's specification for implementing a comprehensive lighting retrofit.
2. **Operational Cost Baseline:** Lighting related O&M expenditures fall under Operations and Maintenance. The baseline is assumed and calculated to be the Mean Time Between Failures of the existing luminaries.
3. **Operational Cost Conservation Methodology:** The new lamps and ballasts being installed have longer material life than the standard lamps and ballasts being replaced. This translates into a longer Mean Time Between Failures (MTBF). In other words, funds will be needed to be spent on material to replace failed lamps and ballasts less often.
4. **Determination of Operational Costs Avoided:** Operational costs were calculated based on the quantity of lamps and ballasts being replaced based on the mean lives of the existing and proposed lamps and ballasts - material savings are agreed to be $20,057/yr.

OSD #2: BOILER PLANT UPGRADES OPERATIONAL COST AVOIDANCE

1. Description and Causal Connection to Scope of Work: Attachment A, ECM 2 describes Honeywell's scope of work for installing new condensing hot water boilers at Roosevelt HS, Roosevelt MS, and Washington-Rose ES.

2. Determination of Operational Costs Avoided: Operational cost avoidance is based on the elimination of repairs and the reduction in preventive maintenance resulting from the installation of these new boilers. The amount of savings is agreed to be $5,000/yr.

OSD #3: MECHANICAL UPGRADES OPERATIONAL COST AVOIDANCE

1. **Description and Connection to Scope of Work:** Attachment A, ECM 4 describes Honeywell's scope of work for installing new chiller compressors at Roosevelt MS and new RTU compressors at Ulysses Byas ES.
2. **Determination of Operational Costs Avoided:** Operational cost savings are a result of a reduction in the District's current repair dollar spend on these existing pieces of equipment. The amount of savings is agreed to be $5,000/yr.

OSD #4: BUILDING MANAGEMENT SYSTEM UPGRADE OPERATIONAL COST AVOIDANCE

1. **Description and Causal Connection to Scope of Work:** Attachment A, ECM 6 describes Honeywell's specification for implementing a comprehensive building management system retrofit.
2. **Determination of Operational Costs Avoided:** Operational cost savings are based on the significant reduction in the annual repair dollar spend on their existing District-wide building automation system (actuators, valves, sensors, controllers, etc.), on the elimination of JACE license upgrades which were necessary every time the District's IT Department performed a District-wide PC JAVA upgrade, and on the reduction of weekday/weekend OT labor due to the lack of remote monitoring capabilities. The amount of savings is agreed to be $33,086/yr.

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Exhibit D-7: Detailed M&V Plan

Roosevelt UFSD
Exhibit D-7
M&V Plan Summary

ECM #	ECM	IPMVP Option	Buildings included in install scope	ECM Intent	Baseline Conditions & Significant Stipulated Values	Measurement Sample Size for Groups w/ Similar Characteristics	Potential-to-Save INSTALL PERIOD		PERFORMANCE PERIOD					
							Key Parameters Measured, Measuring Point & Boundary for Determination of Savings	Post-Install Measurement Responsibility & Frequency	Annual Measured Variables, Measuring Point	Buildings monitored by Option C (Nat Gas & Fuel Oil)	Measurement Responsibility & Frequency	Measurement Procedure	Annual Performance Monitoring Activities	Annual M&V Activities
1	Lighting Upgrades	A – Electric	Centennial Ave ES, Washington-Rose ES, Ulysses Byas ES, Roosevelt MS, Roosevelt HS	Wattage reduction by upgrading existing lighting fixtures to LED lighting	Run hours	80% confidence / 20% precision / 0.5 coefficient of variation	Option A - Electric - kW by power meter.	One-time pre & post kW by power meter	No Annual Measurements	N/A	No Annual Measurements	Option A - Apply post-install values and applicable contract utility rates to engineering calculations to determine Yr1 electricity savings one time.	None	Option A - calculate savings for Year 1. Apply results and applicable contract rates to subsequent performance years.
1	Lighting Upgrades	C - Natural Gas	Centennial Ave ES, Washington-Rose ES, Ulysses Byas ES, Roosevelt MS, Roosevelt HS	Reduce power draw due to higher fixture efficiency	Run hours	80% confidence / 20% precision / 0.5 coefficient of variation	Confirm heating penalty against final "as-builts"	Monthly gas utility bill analysis including regression analysis of building based on HDD	No Annual Measurements	Centennial Ave ES, Washington-Rose ES, Ulysses Byas ES, Roosevelt MS, Roosevelt HS	Customer to provide utility data monthly for Option C analysis	Option C - Complete regression analysis of building based on HDD and input utility bills to generate gas utility savings	None	Option C - complete regression analysis to generate heating savings annually
1	Lighting Controls Upgrades (Interior)	A – Electric	Centennial Ave ES, Washington-Rose ES, Ulysses Byas ES, Roosevelt MS, Roosevelt HS	Reduce runtime of lamp fixtures by installing occupancy sensors	Run hours	80% confidence / 20% precision / 0.5 coefficient of variation	Quantity of sensors installed	One-time	No Annual Measurements	N/A	No Annual Measurements	Option A - Apply post-install values and applicable contract utility rates to engineering calculations to determine Yr1 electricity savings one time.	None	Option A - calculate savings for Year 1. Apply results and applicable contract rates to subsequent performance years.
2	Boiler Plant Upgrades - Boiler Replacement	C - Natural Gas	Washington-Rose ES, Roosevelt MS, Roosevelt HS	Reduce fuel use due to improved combustion and thermal efficiency.	Boiler Load, Environment, weather, & Scheduling/Ops, Thermal Efficiency	100%	Combustion efficiency	1-Time Post-retrofit combustion efficiency test	Combustion efficiency measurements annually by customer. Gas use at building Meters	Centennial Ave ES, Washington-Rose ES, Ulysses Byas ES, Roosevelt MS, Roosevelt HS	Customer to test and provide combustion efficiency values annually. [Copies of tickets] Customer to provide utility data monthly for Option C meters.	Option C - Complete regression analysis of building based on HDD and input utility bills to generate gas savings for Option C buildings.	No Annual Monitoring or Site Inspections	Combustion efficiency testing and annual service (including cleaning) of boilers by customer. Obtain maintenance documentation from customer. Option C - complete regression analysis to generate heating savings annually
2	Boiler Plant Upgrades - Gas Supplier Switch	C - Natural Gas	Washington-Rose ES, Roosevelt MS, Ulysses Byas ES	Reduced cost by switching natural gas suppliers	N/A	100%	N/A	Confirm switch of natural gas supplier from Gateway to National Grid	Confirm switch of natural gas supplier from Gateway to National Grid	Washington-Rose ES, Roosevelt MS, Ulysses Byas ES	Customer to provide monthly gas bills for Option C meters	N/A	N/A	Confirm switch of natural gas supplier from Gateway to National Grid
2	Boiler Plant Upgrades - Gas Bill tax error	C - Natural Gas	Roosevelt HS	removal of state tax from monthly utility bill	N/A	100%	Specific to gas meter acct# 9134266004	Confirm removal of tax billing error from Acct# 9134266004 gas bill	Confirm removal of tax billing error from Acct# 9134266004 gas bill	Roosevelt HS	Customer to provide gas bill monthly for acct# 9134266004	N/A	N/A	Confirm removal of tax billing error from Acct# 9134266004 gas bill monthly
3	Domestic Hot Water Heating Upgrades	C - Natural Gas	Washington-Rose ES, Roosevelt HS	Reduced fuel use through improved thermal efficiency	Baseline Nameplate, Load, Schedule and Environment as stipulated in the projected energy savings calculation	100%	Confirm model#, storage capacity (gallons) from nameplate data post-install. Confirm hot water supply temperature settings.	Post - Nameplate, specification data / cut sheets to confirm new efficiencies	Gas Use at building Meters	Washington-Rose ES, Roosevelt HS	Customer to provide utility data monthly for Option C meters.	Option C - Complete regression analysis of building based on HDD and input utility bills to generate gas utility savings	No Annual Monitoring or Site Inspections	Option C - complete regression analysis to generate heating savings annually
4	Mechanical Upgrades - Motor & VFD	A - Electric	Centennial Ave ES	Reduce power draw by replacing existing motors with higher efficiency and new VFDs	Baseline run hours, setpoints, nameplate data. Baseline kW & kwh and motor efficiency ratings are stipulated as projected in the energy savings calculations	100%	Option A - Electric - pre/post kW by power meter for motors. % speed, HZ, kW, amps, voltage (where applicable) via BMS trends for 2 week time period	One-time pre/post kW by power meter for motors. VFD trends for 2 week time period via BMS trending. (see Key Parameters)	No Annual Measurements	N/A	No Annual Measurements	Option A - Apply post-install values and applicable contract utility rates to engineering calculations to determine Yr1 electricity savings one time.	No Annual Monitoring or Site Inspections	Option A - calculate savings for Year 1, and apply results to subsequent performance years

Exhibit D-7: Detailed M&V Plan

Roosevelt UFSD
Exhibit D-7
M&V Plan Summary

ECM #	ECM	IPMVP Option	Buildings included in install scope	ECM Intent	Baseline Conditions & Significant Stipulated Values	Measurement Sample Size for Groups w/ Similar Characteristics	Potential-to-Save INSTALL PERIOD		PERFORMANCE PERIOD					
							Key Parameters Measured, Measuring Point & Boundary for Determination of Savings	Post-Install Measurement Responsibility & Frequency	Annual Measured Variables, Measuring Point	Buildings monitored by Option C (Nat Gas & Fuel Oil)	Measurement Responsibility & Frequency	Measurement Procedure	Annual Performance Monitoring Activities	Annual M&V Activities
4	Mechanical Upgrades - Chiller Compressor Replacements	A - Electric	Roosevelt MS	Reduce power draw by replacing existing compressors with new	Baseline run hours, setpoints, weather, nameplate data. Baseline kwh and energy efficiency ratings (EER) are stipulated as projected in the energy savings calculations	100%	Option A - Electric - post kW by power meter.	One-time post kW by power meter	No Annual Measurements	N/A	No Annual Measurements	Option A - Apply post-install values and applicable contract utility rates to engineering calculations to determine Yr1 electricity savings one time.	No Annual Monitoring or Site Inspections	Option A - calculate savings for Year 1, and apply results to subsequent performance years
4	Mechanical Upgrades - RTU Compressor Replacements	A - Electric	Ulysses Byas ES	Reduce power draw by replacing existing compressors with new	Baseline run hours, setpoints, weather, nameplate data. Baseline kwh and energy efficiency ratings (EER) are stipulated as projected in the energy savings calculations	80% confidence / 20% precision / 0.5 coefficient of variation	Option A - Electric - post kW by power meter.	One-time post kW by power meter	No Annual Measurements	N/A	No Annual Measurements	Option A - Apply post-install values and applicable contract utility rates to engineering calculations to determine Yr1 electricity savings one time.	No Annual Monitoring or Site Inspections	Option A - calculate savings for Year 1, and apply results to subsequent performance years
4	AC Unit Replacements	A - Electric	Roosevelt MS, Centennial Ave ES	Reduce cooling loads due to efficiency improvements of AC units	Baseline run hours, setpoints, weather, nameplate data. Baseline kwh and energy efficiency ratings (EER) are stipulated as projected in the energy savings calculations	100%	Option A - Electric - post kW by power meter. Post kW to be measured at contractually proposed occupied cooling setpoints. (EER) Energy Efficiency Rating verified by manufacturer's specifications and nameplate data.	One-time post kW by power meter	No Annual Measurements	N/A	No Annual Measurements	Option A - Apply post-install values and applicable contract utility rates to engineering calculations to determine Yr1 electricity savings one time.	No Annual Monitoring or Site Inspections	Option A - calculate savings for Year 1, and apply results to subsequent performance years
4	Mechanical Upgrades - Chilled water pump replacements	A - Electric	Centennial Ave ES	Reduce power draw by replacing existing motors with NEMA Premium Efficiency motors	Baseline run hours, setpoints, weather, nameplate data. Baseline kwh are stipulated as projected in the energy savings calculations	100%	Option A - Electric - post kW by power meter.	One-time post kW by power meter	No Annual Measurements	N/A	No Annual Measurements	Option A - Apply post-install values and applicable contract utility rates to engineering calculations to determine Yr1 electricity savings one time.	No Annual Monitoring or Site Inspections	Option A - calculate savings for Year 1, and apply results to subsequent performance years
5	De-Stratification Fans	A-Electric	Centennial Ave ES, Washington-Rose ES, Ulysses Byas ES, Roosevelt MS, Roosevelt HS	Electric penalty by adding de-strat fans in gyms	Building use & building population	80% confidence / 20% precision / 0.5 coefficient of variation	Option A - Electric - post kW by power meter.	One-time post measurement(s) to be applied to calcs and to be used for Yr1 determination of savings	None	N/A	No Annual Measurements	Option A - Apply contractual rate to engineering calculations to determine Electricity Savings	No Annual Monitoring	Option A - calculate savings for Year 1, and apply results to subsequent performance years
5	De-Stratification Fans	C - Natural Gas	Centennial Ave ES, Washington-Rose ES, Ulysses Byas ES, Roosevelt MS, Roosevelt HS	Heating savings are estimated using a reduction in temperature difference across the building envelope above a certain height.	Building use & building population	100%	Confirm de-strat fan on / off operation and de-strat fan count for each gymnasium	One time post installation verification and photo verification	None	Centennial Ave ES, Washington-Rose ES, Roosevelt MS, Roosevelt HS	Customer to provide utility data monthly for Option C meters.	Complete regression analysis of building based on HDD and input utility bills to generate fuel savings for Option C buildings.	No Annual Monitoring	Option C - complete regression analysis to generate heating savings annually
6	Building Management System Upgrades - Night Setback	A - Electric	Centennial Ave ES, Washington-Rose ES, Ulysses Byas ES, Roosevelt MS, Roosevelt HS	Reduce electric load due to controls upgrades to optimize equipment scheduling and setpoints	Baseline Schedules, Setpoints, Load, and Environment as stipulated in the projected energy savings calculations	100% for all cooling HVAC equipment as projected in the energy savings calculations and/or per the scope of work.	Night Setback: confirm contractual required occupied / unoccupied setpoints and schedules from BMS.	Post - observational review of schedules and setpoints to validate potential to save.	No Annual Measurements	N/A	No Annual Measurements	Option A - Apply post-install values and applicable contract utility rates to engineering calculations to determine Yr1 electricity savings one time.	No Annual Monitoring	Option A - calculate savings for Year 1, and apply results to subsequent performance years

Exhibit D-7: Detailed M&V Plan

Roosevelt UFSD
Exhibit D-7
M&V Plan Summary

ECM #	ECM	IPMVP Option	Buildings included in install scope	ECM Intent	Baseline Conditions & Significant Stipulated Values	Measurement Sample Size for Groups w/ Similar Characteristics	Potential-to-Save INSTALL PERIOD		PERFORMANCE PERIOD					
							Key Parameters Measured, Measuring Point & Boundary for Determination of Savings	Post-Install Measurement Responsibility & Frequency	Annual Measured Variables, Measuring Point	Buildings monitored by Option C (Nat Gas & Fuel Oil)	Measurement Responsibility & Frequency	Measurement Procedure	Annual Performance Monitoring Activities	Annual M&V Activities
6	Building Management System Upgrades - Night Setback	C - Natural Gas	Centennial Ave ES, Washington-Rose ES, Ulysses Byas ES, Roosevelt MS, Roosevelt HS	Reduce heating load due to controls upgrades to optimize equipment scheduling and setpoints	Baseline Schedules, Setpoints, Load, and Environment as stipulated in the projected energy savings calculations	(9) nine Natural Gas Utility Meters	Night Setback: confirm contractual required occupied / unoccupied setpoints and schedules from BMS. Complete regression analysis of building based on HDD and input utility bills to generate Gas utility savings.	Post - observational review of schedules and setpoints to validate potential to save.	Gas Use at building Meters	Centennial Ave ES, Washington-Rose ES, Ulysses Byas ES, Roosevelt MS, Roosevelt HS	Customer to provide utility data monthly for Option C sites.	Option C - Complete regression analysis of building based on HDD and input utility bills to generate Gas utility savings	Observational review of schedules and setpoints to validate guaranteed performance operating parameters	Option C - complete regression analysis to generate heating savings annually
6	Building Management System Upgrades - Plug Load Management	A-Electric	Centennial Ave ES, Washington-Rose ES, Ulysses Byas ES, Roosevelt MS, Roosevelt HS	kWh savings by scheduling devices using plug load controllers per the Att A Scope of Work	Run hours, device watts	80% confidence / 20% precision / 0.5 coefficient of variation per device	Operating schedule	Validate total number of plug load devices installed against equipment list in scope of work. Post-install sample report based on contractually proposed schedules one-time.	No Annual Measurements	N/A	No Annual Measurements	Option A - Apply post-install values and applicable contract utility rates to engineering calculations to determine Yr1 electricity savings one time.	No Annual Monitoring	Option A - calculate savings for Year 1, and apply results to subsequent performance years
6	Building Management System Upgrades - DCV	C - Natural Gas	Centennial Ave ES, Washington-Rose ES, Ulysses Byas ES, Roosevelt MS, Roosevelt HS	Reduce heating load due to controls upgrades to implement demand control ventilation to modulate outside air volume based on indoor CO2 levels	Baseline Damper Position, Supply airflow CFM, Outside airflow CFM, proposed boiler efficiency, Load, Schedule and Environment as stipulated in the projected energy savings calculations	100% (1 unit per school)	OA temp, C02 (ppm), % OA damper position by BMS trend	Post observational review of trending data to validate DCV sequence of operations.	Post observational review of trending data to validate DCV sequence of operations.	Centennial Ave ES, Washington-Rose ES, Ulysses Byas ES, Roosevelt MS, Roosevelt HS	Customer to provide utility data monthly for Option C sites.	Option C - Complete regression analysis of building based on HDD and input utility bills to generate Gas utility savings	Post observational review of trending data to validate DCV sequence of operations.	Option C - complete regression analysis to generate heating savings annually
6	Boiler Plant Upgrades - Gas Supplier Switch	C - Natural Gas	Ulysses Byas ES	Reduced cost by switching natural gas suppliers	N/A	100%	N/A	Confirm switch of natural gas supplier from Gateway to National Grid	Confirm switch of natural gas supplier from Gateway to National Grid	Ulysses Byas ES	Customer to provide monthly gas bills for Option C meter	N/A	N/A	Confirm switch of natural gas supplier from Gateway to National Grid
7	Building Envelope Improvements	A - Electric	Centennial Ave ES, Washington-Rose ES, Ulysses Byas ES, Roosevelt MS, Roosevelt HS	Savings from reducing gravity airflow through gaps and cracks in a building's envelope using weather stripping and air sealing.	All parameters as published in the proposed energy savings calculations	# of units installed per scope of work	Linear feet per unit of materials installed	One time post installation verification and photo verification of sample set of weather stripping and air sealing	No Annual Measurements	N/A	No Annual Measurements	Option A - Apply post-install values and applicable contract utility rates to engineering calculations to determine Yr1 electricity savings one time.	No Annual Monitoring	Option A - calculate savings for Year 1, and apply results to subsequent performance years
7	Building Envelope Improvements	C - Natural Gas	Centennial Ave ES, Washington-Rose ES, Ulysses Byas ES, Roosevelt MS, Roosevelt HS	Savings from reducing gravity airflow through gaps and cracks in a building's envelope using weather stripping and air sealing.	All parameters as published in the proposed energy savings calculations	(9) nine Natural Gas Utility Meters	Linear feet per unit of materials installed	One time post installation verification and photo verification of sample set of weather stripping and air sealing	Gas Use at building Meters	Centennial Ave ES, Washington-Rose ES, Ulysses Byas ES, Roosevelt MS, Roosevelt HS	Customer to provide utility data monthly for Option C sites.	Option C - Complete regression analysis of building based on HDD and input utility bills to generate Gas utility savings	None	Option C - complete regression analysis to generate heating savings annually
8	Install Pipe Insulation	C - Natural Gas	Centennial Ave ES, Washington-Rose ES, Ulysses Byas ES, Roosevelt MS, Roosevelt HS	Reduce heating losses from exposed piping.	All parameters as published in the proposed energy savings calculations	(9) Nine Natural Gas Utility Meters	Quantity, length, and thickness of installed material	One time post installation verification and photo verification of sample set of pipe insulation	Gas Use at building Meters	Centennial Ave ES, Washington-Rose ES, Ulysses Byas ES, Roosevelt MS, Roosevelt HS	Customer to provide utility data monthly for Option C sites.	Option C - Complete regression analysis of building based on HDD and input utility bills to generate Gas utility savings	None	Option C - complete regression analysis to generate heating savings annually

Exhibit D-7: Detailed M&V Plan

Roosevelt UFSD
Exhibit D-7
M&V Plan Summary

ECM #	ECM	IPMVP Option	Buildings included in install scope	ECM Intent	Baseline Conditions & Significant Stipulated Values	Measurement Sample Size for Groups w/ Similar Characteristics	Potential-to-Save INSTALL PERIOD		PERFORMANCE PERIOD					
							Key Parameters Measured, Measuring Point & Boundary for Determination of Savings	Post-Install Measurement Responsibility & Frequency	Annual Measured Variables, Measuring Point	Buildings monitored by Option C (Nat Gas & Fuel Oil)	Measurement Responsibility & Frequency	Measurement Procedure	Annual Performance Monitoring Activities	Annual M&V Activities
9	Walk-in Freezer/Cooler Controllers	A – Electric	Centennial Ave ES, Washington-Rose ES, Ulysses Byas ES, Roosevelt MS, Roosevelt HS	Reduce compressor electric consumption by controlling temperatures of coolers and freezers and installation of high efficiency EC motors in evaporators per Att A scope of work	All parameters as published in the proposed energy savings calculations	(1) cooler for each school and (1) freezer for each school	Customer to incorporate Remote Site Manager and service contract with vendor to monitor key parameters (temps, status, amps); otherwise contractually proposed savings will be stipulated. All LAN drops required for connection to the monitoring system / controllers are the responsibility of the customer.	Confirm total number of devices installed against equipment list in scope of work.	One-time Post-install report generated by customer	N/A	No Annual Measurements	Option A - Apply one time post-install measured values and contractual utility rates to engineering calculations to generate Electricity Savings	No Annual Monitoring	Option A - calculate savings for Year 1, and apply results to subsequent performance years
10	Install Solar PV Systems	A - Electric	Centennial Ave ES, Washington-Rose ES, Roosevelt HS	Generation of electricity by photovoltaic array	Solar Insolation and ambient drybulb temperature (Tdb) as modeled are baseline stipulations used for adjustment of performance period values to baseline conditions. NOAA hi/lo Tdb weather data	Production Meter and Solar Insolation metering -- one (1) set per site	(1) solar AC electrical production and (2) solar insolation are measured; the solar input to the array and production meter out are the boundary for savings determination; grid-electric meter analysis is NOT performed.	Short term (approx 2 weeks) measurements via DAS to verify potential to perform based on (solar out / solar in) efficiency compared to design calculations.	Measure (1) solar AC electrical production and (2) solar insolation via the Solar DAS (data acquisition system)	None	PV system measurements provided by Solar vendor on monthly basis for Yr1 only	Option A Production Expected (kWh) = (Irradiance Measured / Irradiance Modeled) x Production Modeled Adjustment Value (kWh) = Production Modeled - Production Expected Production Adjusted (kWh) = Production Measured + Adjustment Value	Yr1 Monitoring only	Option A - measurement of the performance (AC kW output) of the Solar PV System and comparing to the baseline projection of generation adjusted for off-design solar insolation conditions during performance year. Calculate savings for Year 1 and apply Yr1 results to subsequent performance years

Roosevelt UFSD
Exhibit D-7
Energy Conservation Measures by Facility by M&V Option Type

ECM #	ECM Description	Roosevelt High School	Roosevelt Middle School	Ulysses Byas ES	Washington-Rose ES	Centennial Ave ES
1	Lighting Upgrades	A/C	A/C	A/C	A/C	A/C
1	Lighting Upgrades - Occupancy Sensors	A/_	A/_	A/_	A/_	A/_
2	Boiler Plant Upgrades	_/C	_/C	_/C	_/C	_/C
2	Gas Supplier Switch		_/C		_/C	
2	Gas Bill tax error	_/C				
3	DHW Heating Upgrades	_/C			_/C	
4	Motors & VFDs					_/C
4	Chiller Compressor Replacements		A/_			
4	RTU Compressor Replacements			A/_		
4	AC Unit Replacements		A/_			A/_
4	CHW Pump Replacements					A/_
5	De-Stratification Fans	A/C	A/C	A/C	A/C	A/C
6	BMS Upgrades - Setback Schedules / SPs	A/C	A/C	A/C	A/C	A/C
6	BMS Upgrades - Plug Load Mngmnt	A/_	A/_	A/_	A/_	A/_
6	BMS Upgrades - DCV	A/C	A/C	A/C	A/C	A/C
6	Gas Supplier Switch			_/C		
7	Building Envelope	A/C	A/C	A/C	A/C	A/C
8	Pipe Insulation	_/C	_/C	_/C	_/C	_/C
9	Walk-in Freezer Controllers	A/_	A/_	A/_	A/_	A/_
10	Solar PV Systems	A/_	A/_	A/_	A/_	A/_

Note: The M&V options are distributed by utility type as Electric / Natural Gas.

An underscore indicates where an option is not applicable. A single letter represents the option type, for example, " A " is Option A.

Roosevelt UFSD

Honeywell

BUDGET PRO FORMA
PERFORMANCE CONTRACTING PROJECT
18 YEAR FINANCIAL ANALYSIS

Project Cost	$23,350,000	Building Aid Ratio*	82.80%
Interest Rate	3.75%	Savings Inflation Rate	2.00%
		M&V Inflation Rate	3.00%
Term	18 Years		

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	TOTAL
Baseline Energy Costs**	$1,940,681	$1,979,495	$2,019,085	$2,059,466	$2,100,656	$2,142,669	$2,185,522	$2,229,232	$2,273,817	$2,319,293	$2,365,679	$2,412,993	$2,461,253	$2,510,478	$2,560,687	$2,611,901	$2,664,139	$2,717,422	$41,554,468
Post Improvement Energy Costs	$886,742	$907,746	$929,218	$951,168	$973,609	$996,549	$1,019,998	$1,043,970	$1,068,474	$1,093,521	$1,119,124	$1,145,297	$1,172,049	$1,199,393	$1,227,341	$1,255,908	$1,285,106	$1,314,949	$19,590,162
Energy Savings	**$1,053,939**	**$1,071,749**	**$1,089,867**	**$1,108,298**	**$1,127,047**	**$1,146,120**	**$1,165,524**	**$1,185,262**	**$1,205,343**	**$1,225,772**	**$1,246,555**	**$1,267,696**	**$1,289,204**	**$1,311,085**	**$1,333,346**	**$1,355,993**	**$1,379,033**	**$1,402,473**	**$21,964,306**
Maintenance and Repair Savings	$63,143	$64,406	$65,694	$67,008	$68,348	$69,715	$71,109	$72,531	$73,982	$75,462	$76,971	$78,510	$80,080	$81,682	$83,316	$84,982	$86,682	$88,416	$1,352,037
TOTAL SAVINGS	**$1,117,082**	**$1,136,155**	**$1,155,561**	**$1,175,306**	**$1,195,395**	**$1,215,835**	**$1,236,633**	**$1,257,793**	**$1,279,325**	**$1,301,234**	**$1,323,526**	**$1,346,206**	**$1,369,284**	**$1,392,767**	**$1,416,662**	**$1,440,975**	**$1,465,715**	**$1,490,889**	**$23,316,343**
Project Costs																			
Project Financing***	$2,127,060	$2,127,060	$2,127,060	$2,127,060	$2,127,060	$2,127,060	$2,127,060	$2,127,060	$2,127,060	$2,127,060	$2,127,060	$2,127,060	$2,127,060	$2,127,060	$2,127,060	$0	$0	$0	$31,905,900
Comprehensive Honeywell M&V (Measurement & Verification)	$28,707	$29,569	$30,456	$31,370	$32,311	$33,280	$34,279	$35,307	$36,366	$37,457	$38,581	$39,738	$40,930	$42,158	$43,423	$44,726	$46,068	$47,450	$672,176
TOTAL COSTS	$2,155,767	$2,156,629	$2,157,516	$2,158,430	$2,159,371	$2,160,340	$2,161,339	$2,162,367	$2,163,426	$2,164,517	$2,165,641	$2,166,798	$2,167,990	$2,169,218	$2,170,483	$44,726	$46,068	$47,450	$32,578,076
NET BENEFIT WITHOUT STATE AID	**($1,038,685)**	**($1,020,474)**	**($1,001,955)**	**($983,124)**	**($963,976)**	**($944,505)**	**($924,706)**	**($904,574)**	**($884,101)**	**($863,283)**	**($842,115)**	**($820,592)**	**($798,706)**	**($776,451)**	**($753,821)**	**$1,396,249**	**$1,419,647**	**$1,443,439**	**($9,261,733)**
Rebates	$4,050,783																		$4,050,783
SED Building Aid****	$1,218,090	$1,218,090	$1,218,090	$1,218,090	$1,218,090	$1,218,090	$1,218,090	$1,218,090	$1,218,090	$1,218,090	$1,218,090	$1,218,090	$1,218,090	$1,218,090	$1,218,090	$0	$0	$0	$18,271,350
NET BENEFIT WITH STATE AID	$4,230,188	$197,616	$216,135	$234,966	$254,114	$273,585	$293,384	$313,516	$333,989	$354,807	$375,975	$397,498	$419,384	$441,639	$464,269	$1,396,249	$1,419,647	$1,443,439	$13,060,400
CUMULATIVE CASH FLOW	$4,230,188	$4,427,804	$4,643,939	$4,878,905	$5,133,019	$5,406,604	$5,699,988	$6,013,504	$6,347,493	$6,702,300	$7,078,275	$7,475,773	$7,895,157	$8,336,796	$8,801,065	$10,197,314	$11,616,961	$13,060,400	

*Aid ratio without public vote
**Based on '21 - '22 FY
***Based on semi-annual payments beginning after a 18 month installation period
****Based on current State-wide average interest rate of 2.125%