HONEYWELL
AGREEMENT

CUSTOMER NAME: Floral Park-Bellerose UFSD
HONEYWELL PROPOSAL NUMBER: FPBUFSD122320
DATE OF SUBMISSION: 12-23-20
VALIDITY PERIOD: 01-31-21

TABLE OF CONTENTS

ARTICLE **PAGE**

1. GENERAL PROVISIONS 1

2. HONEYWELL'S RESPONSIBILITIES 1

3. CUSTOMER'S RESPONSIBILITIES 3

4. SUBCONTRACTS 6

5. INSTALLATION AND ACCEPTANCE 6

6. PRICE AND PAYMENT 7

7. CHANGES IN THE PROJECT 7

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

9. TERMINATION OF THE AGREEMENT 10

10. ASSIGNMENT AND GOVERNING LAW 10

11. MISCELLANEOUS PROVISIONS 11

12. DISPUTE RESOLUTION 14

ATTACHMENT A	**THE WORK (SCOPE-OF-WORK)**
ATTACHMENT B	**RESERVED**
ATTACHMENT C	**THE INSTALLATION SCHEDULE**
ATTACHMENT D	**GUARANTEE AND SUPPORT SERVICES AGREEMENT**
ATTACHMENT E	**PAYMENT SCHEDULE**
ATTACHMENT F	**RESERVED**
ATTACHMENT G	**RESERVED**
ATTACHMENT H	**RESERVED**
ATTACHMENT I	**RESERVED**
ATTACHMENT J	**PROJECT ACCEPTANCE**
EXHIBITS	**D-1 THROUGH D-7**

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 300 South Tryon St. Suite 500, Charlotte, NC 28202, and Floral Park-Bellerose Union Free School District located at One Poppy Place, Floral Park, New York 11001 ("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 $167,178 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.

ARTICLE 2
HONEYWELL'S RESPONSIBILITIES

2.1 HONEYWELL Work

2.1.1 Honeywell shall be responsible for construction of the Work.

2.1.2 Honeywell will assist CUSTOMER in securing construction permits necessary for the Work.

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. 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.

2.3 <u>Patent Indemnity</u>

2.3.1 Honeywell shall, at its expense, defend or, at its option, settle any suit that may be instituted against Customer for alleged infringement of any United States patents related to the hardware manufactured and provided by Honeywell under this Agreement, provided that: (a) such alleged infringement consists only in the use of such hardware by itself and not as part of, or in combination with, any other devices, parts or software not provided by Honeywell hereunder; (b) 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 (c) 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.

2.3.4 THIS ARTICLE STATES HONEYWELL'S TOTAL LIABILITY AND CUSTOMER'S SOLE REMEDY FOR ANY ACTUAL OR ALLEGED INFRINGEMENT OF ANY PATENT OR OTHER INTELLECTUAL PROPERTY RIGHTS BY THE HARDWARE MANUFACTURED AND PROVIDED BY HONEYWELL HEREUNDER. IN NO EVENT SHALL HONEYWELL BE LIABLE FOR ANY INDIRECT OR CONSEQUENTIAL DAMAGES RESULTING FROM ANY SUCH ACTUAL OR ALLEGED INFRINGEMENT, EXCEPT AS SET FORTH IN THIS SECTION 2.3.

2.4 <u>Warranties and Completion</u>

2.4.1 Honeywell warrants Customer good and clear title to all equipment and materials furnished to Customer pursuant to this Agreement, 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 one (1) year from the earlier of the date of first beneficial use or substantial completion of 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, at Customer's request, 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 one (1) 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 price of the project.

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 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 Prior to the commencement of the Work and at such future times as HONEYWELL shall reasonably deem appropriate, Customer shall furnish evidence in a form satisfactory to Honeywell that sufficient funds are available and committed to pay for the Work. Unless such evidence is furnished, Honeywell is not required to commence or continue any Work. Further, if CUSTOMER does not provide such evidence, HONEYWELL may stop work upon fifteen (15) days notice to Customer. The failure of Honeywell to insist upon the providing of this evidence at any one time shall not be a waiver of Customer's obligation to make payments pursuant to this Agreement, nor shall it be a waiver of Honeywell's right to request or insist that such evidence be provided at a later date.

3.7.1 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 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.

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. 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 Hazardous Substances or Mold or conditions caused by Hazardous Substances or Mold.

3.8.8 Asbestos-Containing Materials: Customer has not retained Honeywell to undertake any obligations relating to the identification, abatement, cleanup, control, removal or disposal of asbestos-containing materials ("ACM"). Consistent with applicable Laws, Customer shall supply Honeywell with any information in its possession relating to the presence of ACM in areas where Honeywell undertakes any Work or M&V Services. If either Customer or Honeywell becomes aware of or suspects the presence of ACM that may be disturbed by 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 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, 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 TO THE FULLEST EXTENT ALLOWED BY LAW, CUSTOMER SHALL INDEMNIFY AND HOLD HONEYWELL HARMLESS FROM AND AGAINST ANY AND ALL CLAIMS AND COSTS OF WHATEVER NATURE, INCLUDING BUT NOT LIMITED TO, CONSULTANTS' AND ATTORNEYS' FEES, DAMAGES FOR BODILY INJURY AND PROPERTY DAMAGE, FINES, PENALTIES, CLEANUP COSTS AND COSTS ASSOCIATED WITH DELAY OR WORK STOPPAGE, THAT IN ANY WAY RESULTS FROM OR ARISES UNDER THE BREACH OF THE REPRESENTATIONS AND WARRANTIES IN THIS SECTION, THE EXISTENCE OF MOLD OR A HAZARDOUS SUBSTANCE AT A SITE, OR THE OCCURRENCE OR EXISTENCE OF THE SITUATIONS OR CONDITIONS DESCRIBED IN THIS SECTION, WHETHER OR NOT CUSTOMER PROVIDES HONEYWELL ADVANCE NOTICE OF THE EXISTENCE OR OCCURRENCE AND REGARDLESS OF WHEN THE HAZARDOUS SUBSTANCE OR OCCURRENCE IS DISCOVERED OR OCCURS. THIS INDEMNIFICATION SHALL SURVIVE TERMINATION OR EXPIRATION OF THIS AGREEMENT FOR WHATEVER REASON.

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 Reserved.

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 reasonable 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, 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 for performance of the obligations affected by such Excusable Delay. If any delay, or cumulative delays, within Customer's control, extends beyond twenty (20) days, Customer shall negotiate in good faith with Honeywell for a change order for the additional costs resulting therefrom provided that such change order will not result in the Price increasing beyond the amount of the Guarantee Saving under this Agreement.

Notwithstanding anything to the contrary, in light of the COVID-19 pandemic, the effects of which cannot be foreseen, the parties agree that Honeywell may request an increase in the Price or an extension in the Installation Schedule in accordance with Paragraph 7.4 to the extent Honeywell's delivery or performance, or the delivery or performance of its suppliers and/or subcontractors, is delayed, hindered or otherwise affected by the COVID-19 pandemic and not the result of Honeywell's own actions.

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 ten (10) 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 Two Million Five Hundred Fifty Five Thousand Four Hundred Thirty Four Dollars ($2,555,434), 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 the responsibility of Customer and shall entitle Honeywell to an equitable adjustment in the price and schedule. Honeywell and Customer shall negotiate in good faith a change order to increase the Price 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 provided that such change order will not result in the Price increasing beyond the amount of the Guarantee Saving under this Agreement.

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

6.1.5 Reserved.

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 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 then allowed.

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 ninety (90) days from the date a party becomes aware of a change to the Work by written notification.

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**.**

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 Honeywell agrees to indemnify and hold Customer, and Customer's consultants, agents and employees harmless from all claims for bodily injury and property damages, other than the Work itself and other property insured under Paragraph 8.4, to the extent such claims result from or arise under Honeywell's negligent actions or willful misconduct in its performance of the Work or the Support Services. **PROVIDED THAT, NOTHING IN THIS ARTICLE SHALL BE CONSTRUED OR UNDERSTOOD TO ALTER THE LIMITATIONS OF LIABILITY CONTAINED IN THIS ARTICLE, ARTICLE 2, OR THE INDEMNIFICATION CONTAINED IN SECTION 3.8.10.**

8.1.2 Customer shall indemnify and hold harmless Honeywell and Honeywell's consultants, agents and employees from and against all claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of, or resulting from, any act or omission of Customer or Customer's contractors, consultants, agents or employees.

8.1.3 Customer shall require any other contractor who may have a contract on this project 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 $5,000,000 per occurrence and 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.

(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.

(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.

8.2.1 Prior to the 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.

8.3. **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, 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.

8.4.1.1 If Customer finds it necessary to occupy or use a portion or portions of the Sites prior to Substantial Completion thereof, such occupancy shall not commence prior to a time mutually agreed to by Customer and Honeywell and to which the insurance company or companies providing the property insurance have consented by endorsement to the policy or policies. This insurance shall not be canceled or lapsed on account of such partial occupancy. Consent of Honeywell and of the insurance company or companies to such occupancy or use shall not be unreasonably withheld.

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, EXEMPLARY, OR INDIRECT DAMAGES, INCLUDING BUT NOT LIMITED TO, 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. Nothing in this provision shall be construed to limit the recovery for compensatory or actual direct damages suffered by Customer resulting from Honeywell or its agent's negligent or grossly negligent acts or omissions. 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.

9.2 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 ten (10) 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 losses sustained for materials, tools, construction equipment and machinery, including but not limited to, reasonable profit and applicable damages. 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.

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, except that HONEYWELL may assign to another

party the right to receive payments due under this Agreement. 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 as applicable. All workers will be paid according to the prevailing wage rates set forth by the New York State Department of Labor as applicable.

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."

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 INTERNATIONAL INC.
1860 W. Rose Garden Ln.
Phoenix, AZ 85027
Attention: HESG GM Dennis Doyle

With a copy to:
Honeywell Building Solutions
General Counsel
1985 Douglas Drive North
Golden Valley, MN 55422

To Customer:
Floral Park-Bellerose Union Free School District
One Poppy Place
Floral Park, New York 11001
Attention: Michael Fabiano

11.6 **Waiver.** Honeywell's failure to insist upon the performance or fulfillment of any of Customer'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, 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 If any provision is held illegal, invalid or unenforceable, the remaining provisions of this Agreement shall be construed and interpreted to achieve the purposes of the Parties.

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 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 OR MUNICIPAL FINANCIAL PRODUCTS.

11.10 This Agreement, including all attachments and exhibits hereto, represents the entire agreement between CUSTOMER and HONEYWELL and supersedes all prior negotiations, representations or agreements. 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 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.

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 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.

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 may not set off invoiced amounts against sums that are due from HONEYWELL except with prior notification for setoff of Honeywell payments due directly against this Agreement. 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.

11.16 **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.

11.17 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.

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 court of competent jurisdiction, in the 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 2/8/2021

Floral Park-Bellerose UFSD

By Laura Ferone
Name LAURA FERONE
Title PRESIDENT, BOARD OF EDUCATION
Date February 2, 2021

~ This Page Intentionally Left Blank ~

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		
Floral Park Elementary School	John Lewis Childs School	Administration Building

TABLE A-1.1

<u>Scope of Work:</u>

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 T8 Linear LED lamps (2' and 4') are covered by a manufacturer warranty for a period of five (5) years. UL type B T5 LED lamps (4') are covered by a manufacturer warranty for a period of seven (7) years. UL type C T8 LED lamp kits (4' lamps and driver – used where there are existing emergency fixtures) are covered by a manufacturer warranty for a period of ten (10) years.
        i. Emergency ballasts for UL type C Linear LED Lamps are covered by a manufacturer warranty for a period of five (5) years.
    b) Screw in PAR LED lamps are covered by a manufacturer warranty for a period of five (5) years.
    c) Screw in A-Line LED lamps are covered by a manufacturer warranty for a period of one (1) year.
    d) 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 drum fixtures by RemPhos are covered by a manufacturer warranty for a period of ten (10) years.
        ii. New LED exterior fixtures by Lithonia are covered by a manufacturer warranty for a period of five (5) years.

e) New LED recessed can fixtures are covered by a manufacturer warranty for a period of five (5) years.
f) LED Retrofit Kits by RemPhos (for decorative wall sconces) are covered by a manufacturer warranty for a period of ten (10) years.
g) LED Bollard and Post Top ("corncob") Retrofit Modules for HID replacement are covered by a manufacturer warranty for a period of five (5) years.
h) Controls components are covered by a manufacturer warranty for a period of five (5) years.

ECM 2: Boiler Plant Upgrade

Building	PROPOSED STEAM BOILER							
	Boiler Make	Boiler Model	Qty	Input MBH	Fuel	Estimated Efficiency	Burner Make	Burner Model
John Lewis Childs School	Weil McLAIN	Series 94 - 1694	1	5,250	Natural Gas	84	Webster JB2C-30	

Table A-2.1

Scope of Work

1. Demolish and dispose of existing original steam boiler and all associated piping, as well as the associated boiler burners and control panel.
2. Asbestos abatement is limited to the interior boiler insulation only.
3. Furnish and install steam boiler as per Table A-2.1 above including the following items:
    a. (1) McDonell Miller #150 pump controller/low water cut off
    b. (1) McDonell Mille #63m manual reset type low water cut off
    c. (1) Honeywell L404 F operating pressurtrol
    d. (1) Honeywell L4079B manual reset pressurtrol
    e. (1) Honeywell P 781c modulation controller
4. Furnish and install new boiler burner as per table featuring the following:
    a. Modulation
    b. Pressure atomized
    c. Gas pilot ignition
    d. Manual fuel changeover
    e. Burner modulation control panel with standard 4 light package
    f. Alarm with silence switch, control circuit transformer
5. Furnish and install power wiring and reconnection of existing control wiring.
6. Initial water treatment required for boilers start-up.
7. Rigging and setting in place the above described new equipment.
8. Terminate new flue connection at the existing wall penetration and replace the draft fan assembly with new.
9. Reconnect the existing building space steam piping system to the new boiler.
10. Reconnect natural gas piping to the new boiler burner.
11. Insulate new piping and insulation on adjacent piping damaged during construction.
12. Test and commission.

ECM 3: 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-3.1.

Building		
Floral Park Elementary School	John Lewis Childs School	Administration Building

TABLE A-3.1

Scope of Work:

District-Wide

1. Install New Tridium N4 Web Supervisor.
   Furnish and install a new Niagara 4 Supervisor and connect the new Niagara 4 JACE network controllers listed herein. Graphics, alarming, and trending for all buildings will reside in the new District-wide Niagara 4 Supervisor.

Floral Park Elementary School

1) Upgrade Tridium Supervisory Device
   Replace the existing Tridium AX JACE with the latest Tridium N4 JACE. Integrate all new and existing DDC control points into the District-wide BMS.

   Additional Scope Details:
- Provide new graphics for any equipment getting new DDC.
- Retain all existing global programming and commands
- Provide on-site training for facility personnel

2) Retro-Commission Existing Honeywell Field Controllers
   Provide point-to-point checkout and functional testing for existing DDC equipment as per the existing sequence of operations. Existing Honeywell DDC equipment includes: 2 steam boilers and 3 AHUs.

   Additional Scope Details:
- Provide a deficiency list of defective mechanical and control components
- Modify setpoints and sequences to meet specified contract parameters

3) Unit Ventilator Control Upgrade
   Furnish and install new DDC for 65 existing steam unit ventilators that serve the classrooms and some office spaces. Furnish and install new DDC valves. The minimum DDC points shall be as follows:

Unit Ventilator	AI	AO	DI	DO
Fan Start/Stop				65
Fan Status			65	
Heating Valve		65		
Space Temperature	65			
Discharge Air Temperature	65			
Outside Air/Return Air Damper		65		
Freeze Stat			65	

   Additional Scope Details:
- Furnish and install new DDC controllers, sensors, and end devices as needed
- Provide communication wiring to all field controllers as needed

4) Steam Radiator Control Upgrade
Furnish and install new DDC for 20 existing radiators that serve various classroom and office areas. Furnish and install 20 new DDC valves. The minimum DDC points shall be as follows:

Finned Tube Radiator/Convector	AI	AO	DI	DO
Space Temperature	20			
Heating Valve		20		

Additional Scope Details:

- Furnish and install new DDC controllers, sensors, and end devices as needed
- Provide communication wiring to all field controllers as needed

5) Old Gym and New East & West Gym Upgrade
Furnish and install new DDC OA/RA damper actuators on the new gym East & West AHUs and connect to the existing AHU controller. Furnish and install 2 new DDC heating valves for the East & West AHUs. Furnish and install 1 new DDC preheat valve and 2 DDC reheat valves for the Old Gym AHU. Reuse the existing outputs to control the new end devices. Furnish and install new wiring as needed.

6) Self-Contained Control Upgrade
Furnish and install self-contained controls for all steam radiators and/or cabinet unit heaters serving entryways, hallways, closets, and stairwells.

Additional Scope Details:

- Furnish and install thermostatic radiation valve with remote temperature sensing element and locking mechanism
- Furnish and install aquastat control of CUH fans
- Implement temperature setpoint of 55F

7) Plug Load Controls
Provide Wi-Fi programmable plug load controllers to turn off equipment as per the table below:

PROPOSED PLUG LOAD CONTROLS	
Equipment	**Floral Park-Bellerose School**
Projector	24
Smartboard	35
Medium Printer	60
Large Copier	4
AC Unit	58

Additional Scope Details:

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

John Lewis Childs School

1. Upgrade Tridium Supervisory Device
Replace the Tridium AX JACE with the latest Tridium N4 JACE. Integrate all new and existing DDC control points into the District-wide BMS.

Additional Scope Details:

- Provide new graphics for any equipment getting new DDC

- Retain all existing global programming and commands
- Provide on-site training for facility personnel

2. Retro-Commission Existing Honeywell Field Controllers
   Provide point-to-point checkout and functional testing for existing DDC equipment as per the existing sequence of operations. Existing Honeywell DDC equipment includes: 2 steam boilers 2 AHUs, 1 RTU, and 8 exhaust fans.

   Additional Scope Details:
   - Provide a deficiency list of defective mechanical and control components
   - Modify setpoints and sequences to meet specified contract parameters

3. Unit Ventilator Control Upgrade
   Furnish and install new DDC for 44 existing steam unit ventilators that serve the classrooms and some office spaces. Furnish and install new DDC valves. The minimum DDC points shall be as follows:

Unit Ventilator	AI	AO	DI	DO
Fan Start/Stop				44
Fan Status			44	
Heating Valve		44		
Space Temperature	44			
Discharge Air Temperature	44			
Outside Air/Return Air Damper		44		
Freeze Stat			44	

   Additional Scope Details:
   - Furnish and install new DDC controllers, sensors, and end devices as needed
   - Provide communication wiring to all field controllers as needed

4. Steam Radiator Control Upgrade
   Furnish and install new DDC for all existing radiators that serve various classroom and office areas. Furnish and install 25 new DDC valves. The minimum DDC points shall be as follows:

Finned Tube Radiator/Convector	AI	AO	DI	DO
Space Temperature	25			
Heating Valve		25		

   Additional Scope Details:
   - Furnish and install new DDC controllers, sensors, and end devices as needed
   - Provide communication wiring to all field controllers as needed

5. North & South Gym Upgrade
   Furnish and install new DDC OA/RA damper actuators on the North and South gym AHUs and connect to the existing AHU controllers. Furnish and install 2 new DDC heating valves for the North and South AHUs. Reuse the existing outputs to control the new end devices. Furnish and install new wiring as needed.

6. Self-Contained Control Upgrade
   Furnish and install self-contained controls for all steam radiators and/or cabinet unit heaters serving entryways, hallways, closets, and stairwells.

Additional Scope Details:

- Furnish and install thermostatic radiation valve with remote temperature sensing element and locking mechanism
- Furnish and install aquastat control of CUH fans
- Implement temperature setpoint of 55F

7. Plug Load Controls
   Provide Wi-Fi programmable plug load controllers to turn off equipment as per the table below:

PROPOSED PLUG LOAD CONTROLS	
Equipment	**John Lewis Childs School**
Projector	25
Smartboard	12
Medium Printer	46
Large Copier	5
Charging Cart	3
Cold Drink Machine	1
TV	1
AC Unit	39

Additional Scope Details:

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

Administration Building

1. Update and Integrate existing Tridium Supervisory Device
   Update the existing Tridium AX JACE with the latest software. Integrate all existing DDC control points into the new N4 Supervisor.

   Additional Scope Details:

- Retain all existing global programming and commands
- Provide on-site training for facility personnel

2. Retro-Commission Existing Facility Explorer Field Controllers
   Provide point-to-point checkout and functional testing for existing DDC equipment as per the existing sequence of operations. Existing Honeywell DDC equipment includes: 1 hot water boiler and 3 zone pumps.

   Additional Scope Details:

- Provide a deficiency list of defective mechanical and control components
- Modify setpoints and sequences to meet specified contract parameters

3. Plug Load Controls
   Provide Wi-Fi programmable plug load controllers to turn off equipment as per the table below:

PROPOSED PLUG LOAD CONTROLS	
Equipment	**Administration Building**
Smartboard	1

PROPOSED PLUG LOAD CONTROLS	
Equipment	**Administration Building**
Medium Printer	4
Large Copier	2
H/C Water Dispenser	1
AC Unit	9

Additional Scope Details:

1. Program Wi-Fi plug load controllers to turn off equipment during unoccupied periods as described in Exhibit D-1 & D-2
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 4: Pipe Insulation

Scope of Work:

1) Install pipe insulation as detailed in Table A-4.1 thru A-4.2 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.

Steam Piping:

Building	3" Diameter	2" Diameter
Floral Park Elementary School	**57.9**	**15.5**
Totals	**57.9**	**15.5**

TABLE A-4.1

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-4.2

ECM 5: Steam Trap Replacement

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

Building #	Thermostatic	F&T or Bucket
	QTY	QTY
Floral Park Elementary School	171	19
John Lewis Childs School	164	15

TABLE A-5.1

Scope of Work:

1) Replacement/retrofit of steam traps listed in Table A-5.1 above.
2) Thermostatic steam traps will be repaired with new inserts manufactured by Barnes & Jones, or equivalent. The procedure to repair a thermostatic steam trap includes:
   a) Remove the existing seat (if applicable).
   b) Inspect the existing seat for debris and/or deterioration.
   c) Ensure proper fit of the new cage unit.
   d) Apply of anti-seize lubricant to threads.
3) All F&T steam traps will be replaced with new steam traps of like size as manufactured by Barnes & Jones, or equivalent.

PART 2 – GENERAL

A. GENERAL CONDITIONS

1. Honeywell is not responsible for bringing existing lighting/electrical systems up to code.
2. 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.
3. 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.
4. 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.
5. 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.
6. 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.
7. Utility Meter: If new utility meters are required, provision and coordination of utility meters is the responsibility of the customer.
8. 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.

9. 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.

10. 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.

11. 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).

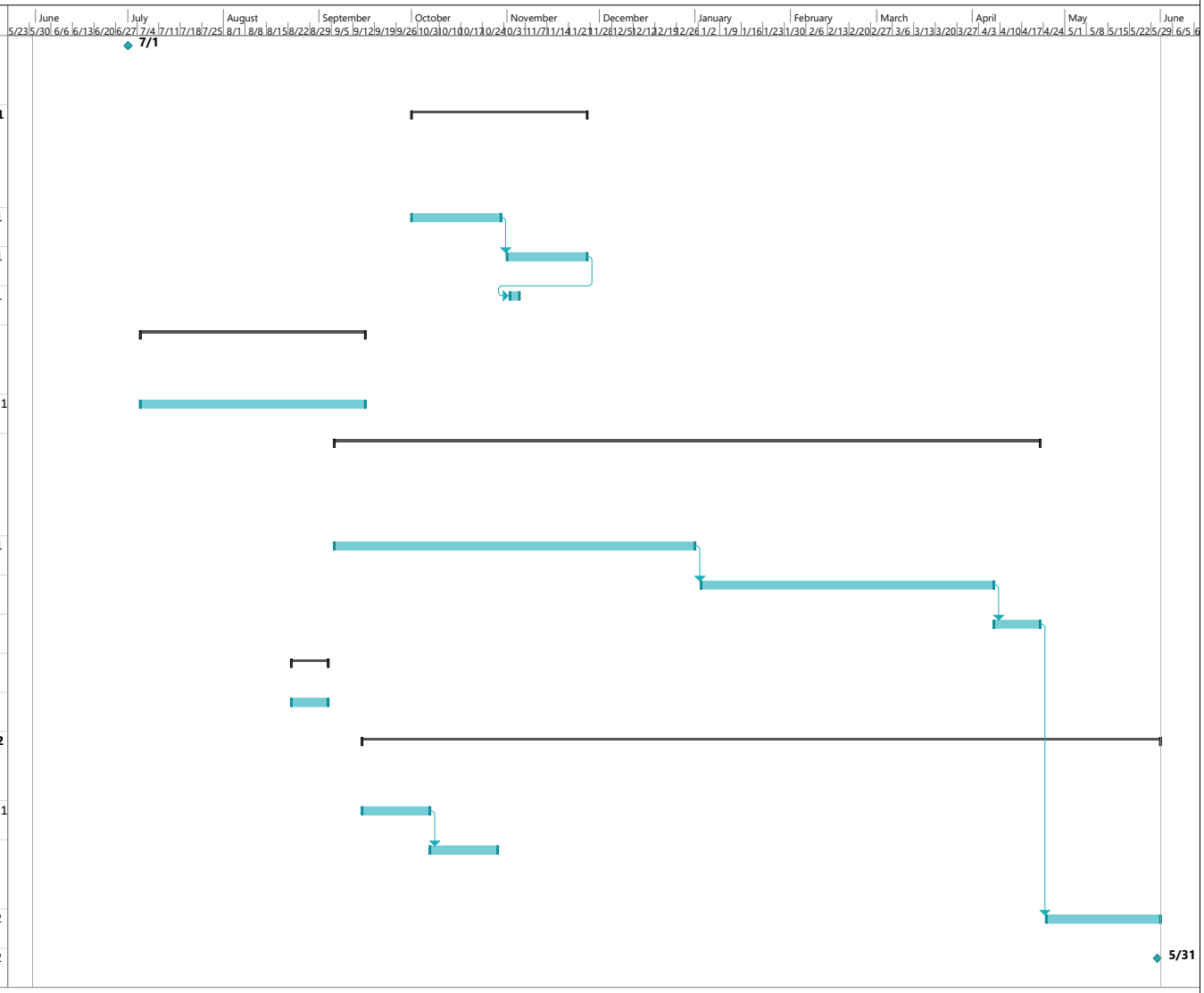
12. Extended Warranties or Service Plans: Honeywell will transfer to the Customer manufacturer warranties and service plans to the extent they extend beyond the one year Honeywell warranty. Following the one year Honeywell warranty the Customer will contact the manufacturer directly for warranty or service 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 C Project Schedule - Floral Park-Bellerose UFSD

ID	Task Mode	Task Name	Duration	Start	Finish
1		SED Approval and Financing Secured	0 days	Thu 7/1/21	Thu 7/1/21
2		**ECM 1 LED Lighting and Lighting Controls Upgrades**	**41 days**	**Fri 10/1/21**	**Fri 11/26/21**
3		Floral Park ES	21 days	Fri 10/1/21	Fri 10/29/21
4		John Lewis Childs School	20 days	Mon 11/1/21	Fri 11/26/21
5		Administration Building	3 days	Tue 11/2/21	Thu 11/4/21
6		**ECM 2 Boiler Plant Upgrade**	**53 days**	**Mon 7/5/21**	**Wed 9/15/21**
7		John Lewis Childs School	53 days	Mon 7/5/21	Wed 9/15/21
8		**ECM 3 Building Management System Upgrades**	**165 days**	**Mon 9/6/21**	**Fri 4/22/22**
9		Floral Park ES	85 days	Mon 9/6/21	Fri 12/31/21
10		John Lewis Childs School	69 days	Mon 1/3/22	Thu 4/7/22
11		Administration Building	11 days	Fri 4/8/22	Fri 4/22/22
12		**ECM 4 Pipe Insulation**	**10 days**	**Mon 8/23/21**	**Fri 9/3/21**
13		Floral Park ES	10 days	Mon 8/23/21	Fri 9/3/21
14		**ECM 5 Steam Trap Replacement**	**185 days**	**Wed 9/15/21**	**Tue 5/31/22**
15		Floral Park ES	16 days	Wed 9/15/21	Wed 10/6/21
16		John Lewis Childs School	16 days	Thu 10/7/21	Thu 10/28/21
17		Walk Through/Punchlist	27 days	Mon 4/25/22	Tue 5/31/22
18		Project Acceptance	0 days	Tue 5/31/22	Tue 5/31/22



Floral Park-Bellerose UFSD
Project Schedule

Task | Split | Milestone | Summary | Project Summary | Inactive Task | Inactive Milestone | Inactive Summary | Manual Task | Duration-only | Manual Summary Rollup | Manual Summary | Start-only | Finish-only | External Tasks | External Milestone | Deadline | Progress | Manual 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: Floral Park-Bellerose UFSD – Energy Performance Contract
Proposal Number: FPBUFSD122320
Date: 12-23-20

("Honeywell")

Honeywell International Inc.
300 South Tryon St., Ste 500
Charlotte, NC 28202

("Customer")

Floral Park-Bellerose UFSD
One Poppy Place
Floral Park, NY 11001

Service Locations and Addresses:

Floral Park-Bellerose School	2 Larch Avenue, Floral Park, NY 11001
John Lewis Childs School	10 Elizabeth Street, Floral Park, NY 11001
Administration Building	One Poppy Place, Floral Park, NY 11001

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**
- ☐ **ServiceNet™ Remote Monitoring and Control Services**
- ☐ **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"): The first day of the following month following the date of Final Project Acceptance of the Work.

Price for Year 1: Four Thousand Five Hundred Eighty Six Dollars, ($4,586), (plus applicable taxes). See Section A.6.2 for price in subsequent years.

Payment Terms: Semi-annual in Advance

Termination of Existing Support Services Agreement: The Customer and Honeywell have an existing Support Services Agreement signed on January 26, 2012. The parties agree that upon execution of the Attachment J Final Project Acceptance Certificate the Energy Auditing and Analysis Services of the existing Support Services

Agreement shall be terminated and this Attachment D Guarantee and Support Services Agreement shall take effect on the Agreement Effective Date noted above.

☐ 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 Cost 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

The following provisions set forth in the Main Agreement shall apply to the Support Services:

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 Reserved.
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, 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 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, 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 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.

YEAR	PRICE
1	$4,586
2	$4,724
3	$4,866
4	$5,012
5	$5,162
6	$5,317
7	$5,476
8	$5,641
9	$5,810
10	$5,984
11	$6,164
12	$6,349
13	$6,539
14	$6,735
15	$6,937
16	$7,145
17	$7,360
18	$7,581

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 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.9.4, 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 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.

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**
Floral Park-Bellerose School	Electric: PSEG Account #: 5150447990 Meter #:80352156	ECM 1 – LED Lighting and Lighting Controls Upgrade ECM 3 - Building Management System Upgrades	1.4.1
	Natural Gas: National Grid Account #: 7742140000 Meter #: 507000661	ECM 1 – LED Lighting and Lighting Controls Upgrade ECM 3 - Building Management System Upgrades ECM 4 – Install Pipe Insulation ECM 5 – Steam Trap Replacement	1.4.2
John Lewis Childs School	Electric: PSEG Account #:5157048000 Meter #:80352860	ECM 1 – LED Lighting and Lighting Controls Upgrade ECM 3 – Building Management System Upgrades	1.4.1
	Natural Gas: National Grid Account #: 5356591006 Meter #: 835800001	ECM 1 – LED Lighting and Lighting Controls Upgrade ECM 2 – Boiler Plant Upgrade ECM 3 – Building Management System Upgrades ECM 5 – Steam Trap Replacement	1.4.2
Administration Building	Electric: PSEG Account #: 5150450021 Meter #: 96931258	ECM 1 – LED Lighting and Lighting Controls Upgrade ECM 3 - Building Management System Upgrades	1.4.1
	Natural Gas: National Grid Account #: 8989318003 Meter #: 507000458	ECM 1 – LED Lighting and Lighting Controls Upgrade ECM 3 - Building Management System Upgrades	1.4.2

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: Electric Savings Only for All Applicable ECMs per table in B.1.1

Term Coverage: Year 1 to End of Term

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

☐ Semi-Annually ☒ Annually

☒ B.**1.4.2 Utility Bill Energy Audit for Option C Verified ECMs –** HONEYWELL will provide *Option C* energy guarantee auditing services as detailed in Part C. Guarantee Terms, Part D. Schedule of Guaranteed Savings, 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 Part D. Schedule of Guaranteed Savings 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 Part C. Guarantee Terms and Part D. Schedule of Guaranteed Savings. Baseline Adjustments shall be shown in the annual reconciliation report subject to CUSTOMER review and approval. These routine and non-routine baseline adjustments will be calculated using industry-standard engineering calculations. HONEYWELL will adjust the energy cost baseline for changes in the unit cost of energy in accordance with the escalation specified in Part D. Schedule of Guaranteed Savings.

Work Coverage: Fuel Savings Only for All Applicable ECMs per table in B.1.1

Term Coverage: Year 1 to End of Term

Advisory reports will be submitted: ☐ Quarterly ☐ Semi-Annually ☒ Annually.

B.2. Additional Support Services: NONE

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 the 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. Customer had the right and onus to hire a consultant to review the calculations and comment prior to acceptance of the price for M&V services and contract execution. Any future use of a consultant to review M & V methods, reports and calculations is at Customer's discretion and expense, and 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. In the event Customer requests to modify the M&V methodology or to conduct a review outside of the scope of the contractually defined M&V method, Honeywell will prepare a Change Order to modify the M&V scope and price for Customer's review and execution. In addition, any extra work required of Honeywell by Customer's consultant, other than making corrections pursuant to the M&V methods set forth in the contract, shall be at Customer's expense at the rate of $150 per hour.

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-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.

Customer is responsible for completing a comprehensive steam trap survey on all facilities with Option C steam trap guarantee. The results of the steam trap survey will be furnished to Honeywell one month prior to annual guarantee anniversary date. Baseline adjustments will be applied as needed based upon each year's failure rate. If such reports are not provided, Honeywell reserves the right to model a steam trap degradation of up to 15% compounded annually for baseline adjustment purposes.

Customer is also responsible for annual combustion efficiency testing the results of which will be forwarded to Honeywell one month prior to annual guarantee anniversary date.

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 <u>Customer Reporting Responsibilities.</u> 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 <u>Reported Material Changes.</u> Customer shall deliver to Honeywell a written notice describing and explaining all actual or proposed Material Changes (as defined below) 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 <u>Customer Granted Access for Remote Diagnostics.</u> 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 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 <u>Customer Provided Documentation.</u> 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 <u>Customer Governmental Unit Reporting Responsibilities.</u> 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 <u>Customer Rebate and Ratchet Reset Responsibilities.</u> It is understood that all energy rebates and/or refunds are the result of an agreement between Customer and the utility company and Honeywell assumes no

responsibility for obtaining said rebates and/or refunds. It is understood that said rebates and/or refunds are not included in the Guaranteed Savings. The Customer is responsible for procuring a ratchet reset from the local utility company, as applicable.

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 $2,773,050. 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	$ 89,532	$ 39,975	$ 129,507
2	$ 91,323	$ 40,775	$ 132,097
3	$ 93,149	$ 41,590	$ 134,739
4	$ 95,012	$ 42,422	$ 137,434
5	$ 96,912	$ 43,271	$ 140,183
6	$ 98,851	$ 44,136	$ 142,986
7	$ 100,828	$ 45,019	$ 145,846
8	$ 102,844	$ 45,919	$ 148,763
9	$ 104,901	$ 46,837	$ 151,738
10	$ 106,999	$ 47,774	$ 154,773
11	$ 109,139	$ 48,730	$ 157,869
12	$ 111,322	$ 49,704	$ 161,026
13	$ 113,548	$ 50,698	$ 164,247
14	$ 115,819	$ 51,712	$ 167,531
15	$ 118,136	$ 52,747	$ 170,882
16	$ 120,498	$ 53,801	$ 174,300
17	$ 122,908	$ 54,877	$ 177,786
18	$ 125,366	$ 55,975	$ 181,341
TOTALS	**$ 1,917,087**	**$ 855,963**	**$ 2,773,050**

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	$ 29,607	$ (1,061)	$ -	$ -	$ -	$28,546
2	Boiler Replacement	$ -	$ 1,530	$ -	$ -	$ -	$1,530
3	Building Management System Upgrades	$ 5,100	$ 30,403	$ -	$ -	$ -	$35,503
4	Install Pipe Insulation	$ -	$ 649	$ -	$ -	$ -	$649
5	Steam Trap Replacement	$ -	$ 23,304	$ -	$ -	$ -	$23,304
	Totals	**$34,707**	**$54,825**	**$ -**	**$ -**	**$ -**	**$89,532**

[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) Fuel Conversion: RESERVED.

(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 Michael Fabiano – Assistant Superintendent of Business, and Paul Gustafsson – 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	$1,482
2	Boiler Replacement	2	O&M	$10,000
3	Building Management System Upgrades	3	O&M	$28,493
			Total	$39,975

[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-5for 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 Director of Facilities – Paul Gustafsson.

The Baseline Period is defined as 07/2018 to 06/2019.

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 **RESERVED**

D.2.3 **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 Replacement	Repair bill savings resulting from the installation of new equipment.	D-6
3	Building Management System Upgrades	As a result of the elimination of the existing pneumatic systems and a full DDC upgrade, repair costs associated with the Building Management System will be eliminated.	D-6
The operational savings measures and which budget line items or invoice categories that are affected, are cross-referenced in each Operational Costs Savings Detail in the Exhibits.			

[a] O&M: operations and maintenance.

D.4 **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: $2,555,434

Honeywell's price is based upon the contract being signed and the financing being secured by June 30, 2021. 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%	$1,277,717
Monthly Progress Payments:	50%	$1,277,717
Total Payments:		**$2,555,434**

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 $167,178 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.

This Page Intentionally Left Blank

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 Upgrade		
ECM 3: Building Management System Upgrades		
ECM 4: Pipe Insulation		
ECM 5: Steam Trap Replacement		

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)

~ This Page Intentionally Left Blank ~

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

Floral Park-Bellerose 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 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 72°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 85°F unoccupied. During the guarantee period, the occupied cooling setpoint shall be 76°F and the unoccupied cooling setpoint shall be 85°F.

Data logging has not been performed since the schools are closed due to the pandemic.

a. Existing schedules and setpoints are based on detailed review of Building Management Systems/thermostats, interviews with staff.
b. 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	6:00pm	12:00am	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**
72°F	55°F	85°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

John Lewis Childs 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 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 72°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 85°F unoccupied. During the guarantee period, the occupied cooling setpoint shall be 76°F and the unoccupied cooling setpoint shall be 85°F.

Data logging has not been performed since the schools are closed due to the pandemic.

a. Existing schedules and setpoints are based on detailed review of Building Management Systems/thermostats, interviews with staff.
b. 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	6:00pm	12:00am	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**
72°F	55°F	85°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

Administration Building

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 7:00am to 5:00pm Monday through Friday, with unoccupied operation during all other hours.

The existing occupied heating setpoint is 73°F and the unoccupied heating setpoint is 73°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 85°F unoccupied. During the guarantee period, the occupied cooling setpoint shall be 76°F and the unoccupied cooling setpoint shall be 85°F.

Data logging has not been performed since the facility was closed due to the pandemic.

a. Existing schedules and setpoints are based on detailed review of Building Management Systems/thermostats, interviews with staff.
b. 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	7:00am	12:00am	Unoccupied
Existing HVAC Stop Time	**Proposed HVAC Stop Time**	**Existing HVAC Stop Time**	**Proposed HVAC Stop Time**
12:00am	5:00pm	12:00am	Unoccupied

HEATING		COOLING	
Existing Occupied Setpoint	**Proposed Occupied Setpoint**	**Existing Occupied Setpoint**	**Proposed Occupied Setpoint**
73°F	68°F	74°F	76°F
Existing Unoccupied Setpoint	**Proposed Unoccupied Setpoint**	**Existing Unoccupied Setpoint**	**Proposed Unoccupied Setpoint**
73°F	55°F	85°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) *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 Cost

Floral Park-Bellerose UFSD
Exhibit D-3 - Utility Data
Utility Summary
July 2018 through June 2019
FY 18/19

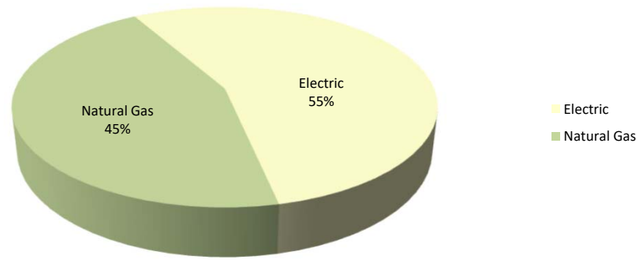
Building	Square Footage	Electric								Fuel Designation	Natural Gas						Total Thermal				Water				Total Energy		
		Total Cost	Total kWh	Demand Cost	Fixed Costs	Total kW Demand	$/kW	$/kWh	$ per Square Ft	Main Heating Utility	Total Cost	Fixed Costs	Total Therms	Blended Rate	$/Therm	$ per Square Ft	Total Cost	MMBtu/ Yr Total	$/MMBtu	$ per Square Ft	Total Cost	Fixed Costs	kGal	Price per kGal	$/Sq ft	kBtu/sq ft	Total Cost
Floral Park Bellerose Elementary School	132,330	$ 69,620	362,640	$ 17,874	$ 7,443	1,568	$ 11.40	$ 0.122	$ 0.53	Natural Gas	$ 69,100	$ -	79,052	$ 0.87	$ 0.87	$ 0.52	$ 69,100	7,905	$ 8.74	$ 0.52	$ -	$ -	-	$ -	$ 1.05	69.09	$ 138,719
John Lewis Childs School	77,920	$ 57,035	274,560	$ 17,773	$ 6,573	2,003	$ 8.88	$ 0.119	$ 0.73	Natural Gas	$ 35,656	$ -	37,356	$ 0.95	$ 0.95	$ 0.46	$ 35,656	3,736	$ 9.54	$ 0.46	$ -	$ -	-	$ -	$ 1.19	59.97	$ 92,691
Administration Building	3,650	$ 5,340	23,060	$ 1,654	$ 237	115	$ 14.44	$ 0.150	$ 1.46	Natural Gas	$ 3,525	$ -	2,305	$ 1.53	$ 1.53	$ 0.97	$ 3,525	231	$ 15.29	$ 0.97	$ -	$ -	-	$ -	$ 2.43	84.71	$ 8,865
TOTALS	**213,900**	**$ 131,994**	**660,260**	**$ 37,300**	**$ 14,254**	**3,685**	**$ 10.12**	**$ 0.122**	**$ 0.62**		**$ 108,281**	**$ -**	**118,713**	**$ 0.91**	**$ 0.91**	**$ 0.51**	**$ 108,281**	**11,871**	**$ 9.12**	**$ 0.51**	**$ -**	**$ -**	**-**	**$ -**	**$ 1.12**	**66.03**	**$ 240,275**

Electric	**$ 131,994**
Natural Gas	**$ 108,281**
Total	**$ 240,275**

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

Utility Costs by Type



Floral Park-Bellerose UFSD
Exhibit D-3 - Utility Data
Electric Data

Account #	Meter #	Rate Structure	Location	Billing Start Date	Billing End Date	Billing Days	Delivery By	Billed kW	Billed kWh	kW Cost	kWh Cost	Fixed Costs	Total Delivery Cost	Supply By	Total Supply Cost	Total Cost
5150450021	96931258	281	1 Poppy Place	7/3/2018	8/2/2018	30	PSEG	12.0	2,420	$ 174.48	$ 358.86	$ 30.42	$ 292.04	PSEG	$ 241.30	**$ 563.76**
5150450021	96931258	281	1 Poppy Place	8/2/2018	9/7/2018	36	PSEG	11.0	3,000	$ 191.93	$ 454.91	$ 36.13	$ 335.39	PSEG	$ 311.45	**$ 682.97**
5150450021	96931258	281	1 Poppy Place	9/7/2018	10/2/2018	25	PSEG	9.5	1,840	$ 114.34	$ 286.41	$ 22.24	$ 205.70	PSEG	$ 195.05	**$ 422.99**
5150450021	96931258	281	1 Poppy Place	10/2/2018	11/3/2018	32	PSEG	8.5	2,060	$ 120.86	$ 303.44	$ 23.09	$ 202.58	PSEG	$ 221.72	**$ 447.39**
5150450021	96931258	281	1 Poppy Place	11/3/2018	12/4/2018	31	PSEG	8.5	1,720	$ 117.08	$ 256.72	$ 20.82	$ 193.49	PSEG	$ 180.31	**$ 394.62**
5150450021	96931258	281	1 Poppy Place	12/4/2018	1/4/2019	31	PSEG	8.5	1,670	$ 118.68	$ 241.65	$ 19.70	$ 195.56	PSEG	$ 164.77	**$ 380.03**
5150450021	96931258	281	1 Poppy Place	1/4/2019	2/6/2019	33	PSEG	11.0	2,020	$ 178.35	$ 285.26	$ 16.74	$ 270.40	PSEG	$ 193.21	**$ 480.35**
5150450021	96931258	281	1 Poppy Place	2/6/2019	3/6/2019	28	PSEG	8.5	1,540	$ 116.94	$ 228.83	$ 12.53	$ 193.11	PSEG	$ 152.66	**$ 358.30**
5150450021	96931258	281	1 Poppy Place	3/6/2019	4/4/2019	29	PSEG	8.5	2,250	$ 121.11	$ 295.98	$ 16.36	$ 207.28	PSEG	$ 209.81	**$ 433.45**
5150450021	96931258	281	1 Poppy Place	4/4/2019	5/3/2019	29	PSEG	8.5	860	$ 121.11	$ 148.80	$ 8.95	$ 191.85	PSEG	$ 78.06	**$ 278.86**
5150450021	96931258	281	1 Poppy Place	5/3/2019	6/6/2019	34	PSEG	10.0	1,890	$ 139.36	$ 280.40	$ 15.11	$ 243.62	PSEG	$ 218.53	**$ 462.15**
5150450021	96931258	281	1 Poppy Place	6/6/2019	7/2/2019	26	PSEG	10.0	1,790	$ 139.36	$ 280.40	$ 15.11	$ 243.62	PSEG	$ 176.14	**$ 434.87**
5157048000	80352860	285	S. Tyson Ave	7/9/2018	8/7/2018	29	PSEG	68.8	15,960	$ 2,036.12	$ 1,909.75	$ 496.45	$ 2,434.07	PSEG	$ 1,232.61	**$ 4,163.13**
5157048000	80352860	285	S. Tyson Ave	8/7/2018	9/7/2018	31	PSEG	256.5	21,000	$ 3,670.50	$ 2,678.96	$ 734.39	$ 4,167.68	PSEG	$ 2,181.78	**$ 7,083.85**
5157048000	80352860	285	S. Tyson Ave	9/7/2018	9/30/2018	23	PSEG	269.1	21,960	$ 2,766.46	$ 2,879.15	$ 589.95	$ 3,313.38	PSEG	$ 2,332.23	**$ 6,235.56**
5157048000	80352860	285	S. Tyson Ave	9/30/2018	10/5/2018	5	PSEG	125.6	4,800	$ 121.62	$ 599.30	$ 95.24	$ 211.14	PSEG	$ 509.78	**$ 816.16**
5157048000	80352860	285	S. Tyson Ave	10/5/2018	11/6/2018	32	PSEG	128.9	26,760	$ 798.84	$ 3,356.68	$ 586.68	$ 1,280.83	PSEG	$ 2,874.69	**$ 4,742.20**
5157048000	80352860	285	S. Tyson Ave	11/6/2018	12/6/2018	30	PSEG	104.9	23,160	$ 609.47	$ 2,827.06	$ 528.06	$ 1,019.17	PSEG	$ 2,417.36	**$ 3,964.59**
5157048000	80352860	285	S. Tyson Ave	12/6/2018	1/7/2019	32	PSEG	106.2	22,680	$ 673.53	$ 2,633.37	$ 544.72	$ 1,078.82	PSEG	$ 2,228.08	**$ 3,851.62**
5157048000	80352860	285	S. Tyson Ave	1/7/2019	2/6/2019	30	PSEG	100.8	26,280	$ 648.14	$ 3,034.73	$ 513.59	$ 1,166.36	PSEG	$ 2,516.51	**$ 4,196.46**
5157048000	80352860	285	S. Tyson Ave	2/6/2019	3/6/2019	28	PSEG	99.7	21,240	$ 598.33	$ 2,515.11	$ 462.83	$ 1,007.87	PSEG	$ 2,105.57	**$ 3,576.27**
5157048000	80352860	285	S. Tyson Ave	3/6/2019	4/4/2019	29	PSEG	102.8	24,480	$ 638.97	$ 2,766.16	$ 490.97	$ 1,122.38	PSEG	$ 2,282.75	**$ 3,896.10**
5157048000	80352860	285	S. Tyson Ave	4/4/2019	5/6/2019	32	PSEG	97.1	20,520	$ 665.98	$ 2,266.72	$ 507.33	$ 1,065.33	PSEG	$ 1,867.37	**$ 3,440.03**
5157048000	80352860	285	S. Tyson Ave	5/6/2019	5/31/2019	25	PSEG	112.3	20,160	$ 601.74	$ 2,305.39	$ 419.80	$ 1,005.34	PSEG	$ 1,901.79	**$ 3,326.93**
5157048000	80352860	285	S. Tyson Ave	5/31/2019	6/6/2019	6	PSEG	195.6	3,600	$ 498.71	$ 437.62	$ 97.48	$ 596.73	PSEG	$ 339.60	**$ 1,033.81**
5157048000	80352860	285	S. Tyson Ave	6/6/2019	7/5/2019	29	PSEG	234.3	21,960	$ 3,444.84	$ 2,757.49	$ 505.87	$ 4,050.96	PSEG	$ 2,151.37	**$ 6,708.20**
5150447990	80352156	285	Floral Park-Bellerose UFSD	7/6/2018	8/6/2018	31	PSEG	75.5	25,320	$ 2,139.15	$ 3,577.66	$ 817.45	$ 2,457.99	PSEG	$ 2,508.43	**$ 5,783.87**
5150447990	80352156	285	Floral Park-Bellerose UFSD	8/6/2018	9/6/2018	31	PSEG	158.8	28,320	$ 4,278.30	$ 3,577.66	$ 817.45	$ 4,915.98	PSEG	$ 2,939.98	**$ 8,673.41**
5150447990	80352156	285	Floral Park-Bellerose UFSD	9/6/2018	9/30/2018	24	PSEG	147.8	29,040	$ 3,127.63	$ 3,784.21	$ 668.78	$ 3,829.75	PSEG	$ 3,082.09	**$ 7,580.62**
5150447990	80352156	285	Floral Park-Bellerose UFSD	9/30/2018	10/4/2018	4	PSEG	120.5	3,960	$ 93.35	$ 494.38	$ 76.66	$ 167.44	PSEG	$ 420.29	**$ 664.39**
5150447990	80352156	285	Floral Park-Bellerose UFSD	10/4/2018	11/5/2018	32	PSEG	126.7	32,520	$ 785.20	$ 4,070.12	$ 619.20	$ 1,359.64	PSEG	$ 3,495.68	**$ 5,474.52**
5150447990	80352156	285	Floral Park-Bellerose UFSD	11/5/2018	12/5/2018	30	PSEG	109.4	32,400	$ 635.61	$ 3,955.04	$ 583.52	$ 1,201.96	PSEG	$ 3,388.69	**$ 5,174.17**
5150447990	80352156	285	Floral Park-Bellerose UFSD	12/5/2018	1/4/2019	30	PSEG	109.1	28,320	$ 642.89	$ 3,292.24	$ 553.84	$ 1,141.53	PSEG	$ 2,793.60	**$ 4,488.97**
5150447990	80352156	285	Floral Park-Bellerose UFSD	1/4/2019	2/5/2019	32	PSEG	107.5	36,720	$ 737.31	$ 4,214.96	$ 593.92	$ 1,445.81	PSEG	$ 3,506.46	**$ 5,546.19**
5150447990	80352156	285	Floral Park-Bellerose UFSD	2/5/2019	3/5/2019	28	PSEG	106.6	27,720	$ 639.74	$ 3,278.87	$ 497.75	$ 1,163.80	PSEG	$ 2,754.81	**$ 4,416.36**
5150447990	80352156	285	Floral Park-Bellerose UFSD	3/5/2019	4/3/2019	29	PSEG	107.5	31,800	$ 668.18	$ 3,588.02	$ 529.65	$ 1,287.34	PSEG	$ 2,968.86	**$ 4,785.85**
5150447990	80352156	285	Floral Park-Bellerose UFSD	4/3/2019	5/3/2019	30	PSEG	111.1	26,160	$ 714.37	$ 2,877.25	$ 512.60	$ 1,217.40	PSEG	$ 2,374.22	**$ 4,104.22**
5150447990	80352156	285	Floral Park-Bellerose UFSD	5/3/2019	5/31/2019	28	PSEG	116.9	27,720	$ 701.56	$ 3,155.47	$ 497.51	$ 1,248.46	PSEG	$ 2,608.06	**$ 4,354.03**
5150447990	80352156	285	Floral Park-Bellerose UFSD	5/31/2019	6/5/2019	5	PSEG	106.1	3,360	$ 385.39	$ 405.64	$ 82.88	$ 474.84	PSEG	$ 316.19	**$ 873.91**
5150447990	80352156	285	Floral Park-Bellerose UFSD	6/5/2019	7/3/2019	28	PSEG	64.4	29,280	$ 2,324.86	$ 3,693.83	$ 591.98	$ 3,071.22	PSEG	$ 4,035.87	**$ 7,699.07**

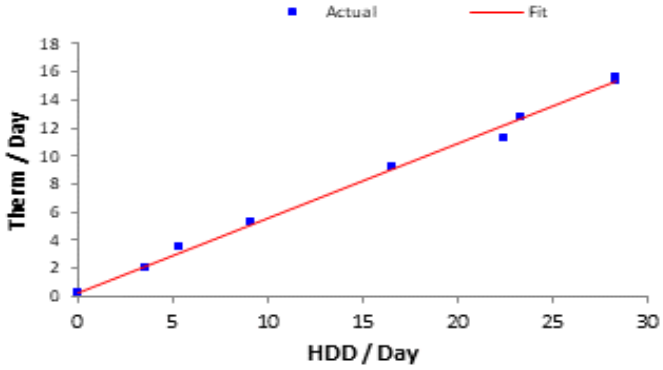
Floral Park-Bellerose UFSD
Exhibit D-3 - Utility Data
Natural Gas Data

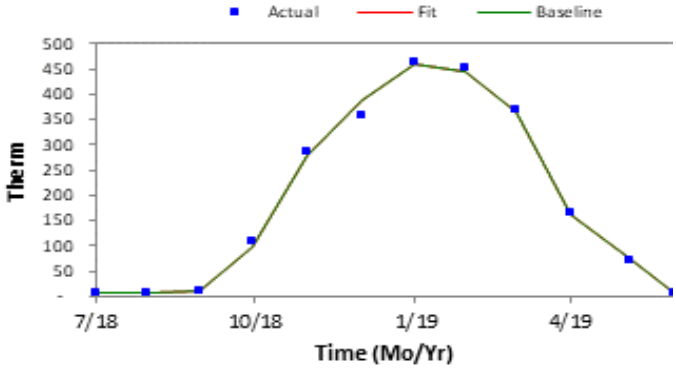
Account #	Meter #	Rate Structure	Location	Billing Start Date	Billing End Date	Billing Days	Delivery By	Therms	Total Delivery Cost	Supply By	Total Supply Cost	Total Cost
7742140000	507000661		Floral Park Bellerose - BOILER	6/29/2018	7/31/2018	32	National Grid	2	$ 42.04	National Grid	$ 1.07	**$ 43.11**
7742140000	507000661		Floral Park Bellerose - BOILER	7/31/2018	8/29/2018	29	National Grid	-	$ 38.22	National Grid	$ -	**$ 38.22**
7742140000	507000661		Floral Park Bellerose - BOILER	8/29/2018	9/28/2018	30	National Grid	1	$ 39.50	National Grid	$ 0.44	**$ 39.94**
7742140000	507000661		Floral Park Bellerose - BOILER	9/28/2018	10/29/2018	31	National Grid	2,510	$ 1,090.34	National Grid	$ 1,146.20	**$ 2,236.54**
7742140000	507000661		Floral Park Bellerose - BOILER	10/29/2018	11/29/2018	31	National Grid	10,470	$ 3,092.95	National Grid	$ 5,342.84	**$ 8,435.79**
7742140000	507000661		Floral Park Bellerose - BOILER	11/29/2018	12/31/2018	32	National Grid	10,479	$ 3,676.90	National Grid	$ 6,764.19	**$ 10,441.09**
7742140000	507000661		Floral Park Bellerose - BOILER	12/31/2018	1/30/2019	30	National Grid	17,832	$ 5,535.06	National Grid	$ 10,500.42	**$ 16,035.48**
7742140000	507000661		Floral Park Bellerose - BOILER	1/30/2019	2/28/2019	29	National Grid	16,463	$ 5,068.62	National Grid	$ 8,274.34	**$ 13,342.96**
7742140000	507000661		Floral Park Bellerose - BOILER	2/28/2019	3/29/2019	29	National Grid	12,075	$ 3,494.12	National Grid	$ 5,199.79	**$ 8,693.91**
7742140000	507000661		Floral Park Bellerose - BOILER	3/29/2019	4/30/2019	32	National Grid	5,067	$ 2,266.03	National Grid	$ 2,123.43	**$ 4,389.46**
7742140000	507000661		Floral Park Bellerose - BOILER	4/30/2019	6/3/2019	34	National Grid	2,034	$ 949.48	National Grid	$ 772.50	**$ 1,721.98**
7742140000	507000661		Floral Park Bellerose - BOILER	6/3/2019	6/28/2019	25	National Grid	-	$ 33.51	National Grid	$ -	**$ 33.51**
5356591006	835800001		John Lewis Childs School - BOILER	7/2/2018	8/2/2018	31	National Grid	3	$ 40.79	National Grid	$ 1.60	**$ 42.39**
5356591006	835800001		John Lewis Childs School - BOILER	8/2/2018	8/30/2018	28	National Grid	-	$ 36.96	National Grid	$ -	**$ 36.96**
5356591006	835800001		John Lewis Childs School - BOILER	8/30/2018	10/1/2018	32	National Grid	-	$ 42.04	National Grid	$ -	**$ 42.04**
5356591006	835800001		John Lewis Childs School - BOILER	10/1/2018	10/30/2018	29	National Grid	2,062	$ 913.81	National Grid	$ 941.88	**$ 1,855.69**
5356591006	835800001		John Lewis Childs School - BOILER	10/30/2018	11/30/2018	31	National Grid	4,627	$ 1,678.77	National Grid	$ 2,366.85	**$ 4,045.62**
5356591006	835800001		John Lewis Childs School - BOILER	11/30/2018	1/2/2019	33	National Grid	4,985	$ 2,106.11	National Grid	$ 3,223.00	**$ 5,329.11**
5356591006	835800001		John Lewis Childs School - BOILER	1/2/2019	1/31/2019	29	National Grid	7,819	$ 2,666.96	National Grid	$ 4,604.25	**$ 7,271.21**
5356591006	835800001		John Lewis Childs School - BOILER	1/31/2019	3/1/2019	29	National Grid	6,700	$ 2,422.08	National Grid	$ 3,319.09	**$ 5,741.17**
5356591006	835800001		John Lewis Childs School - BOILER	3/1/2019	4/1/2019	31	National Grid	5,573	$ 2,012.62	National Grid	$ 2,398.64	**$ 4,411.26**
5356591006	835800001		John Lewis Childs School - BOILER	4/1/2019	5/1/2019	30	National Grid	1,974	$ 1,099.36	National Grid	$ 823.17	**$ 1,922.53**
5356591006	835800001		John Lewis Childs School - BOILER	5/1/2019	6/4/2019	34	National Grid	738	$ 462.63	National Grid	$ 280.32	**$ 742.95**
5356591006	835800001		John Lewis Childs School - BOILER	6/4/2019	7/1/2019	27	National Grid	-	$ 36.05	National Grid	$ -	**$ 36.05**
8989318003	507000458		Administration Building	6/29/2018	7/31/2018	32	National Grid	7	$ 48.25	National Grid	$ 3.77	**$ 52.02**
8989318003	507000458		Administration Building	7/31/2018	8/29/2018	29	National Grid	7	$ 44.93	National Grid	$ 3.14	**$ 48.07**
8989318003	507000458		Administration Building	8/29/2018	9/28/2018	30	National Grid	9	$ 49.31	National Grid	$ 4.05	**$ 53.36**
8989318003	507000458		Administration Building	9/28/2018	10/29/2018	31	National Grid	109	$ 190.81	National Grid	$ 49.79	**$ 240.60**
8989318003	507000458		Administration Building	10/29/2018	11/29/2018	31	National Grid	285	$ 251.49	National Grid	$ 145.42	**$ 396.91**
8989318003	507000458		Administration Building	11/29/2018	12/31/2018	32	National Grid	359	$ 311.52	National Grid	$ 231.75	**$ 543.27**
8989318003	507000458		Administration Building	12/31/2018	1/30/2019	30	National Grid	462	$ 352.96	National Grid	$ 272.03	**$ 624.99**
8989318003	507000458		Administration Building	1/30/2019	2/28/2019	29	National Grid	453	$ 341.18	National Grid	$ 227.67	**$ 568.85**
8989318003	507000458		Administration Building	2/28/2019	3/29/2019	29	National Grid	370	$ 290.76	National Grid	$ 159.34	**$ 450.10**
8989318003	507000458		Administration Building	3/29/2019	4/30/2019	32	National Grid	167	$ 249.82	National Grid	$ 69.99	**$ 319.81**
8989318003	507000458		Administration Building	4/30/2019	6/3/2019	34	National Grid	70	$ 156.53	National Grid	$ 26.60	**$ 183.13**
8989318003	507000458		Administration Building	6/3/2019	6/28/2019	25	National Grid	7	$ 41.26	National Grid	$ 2.68	**$ 43.94**

Meter Tuning Contract

Project: Floral Park-Bellerose
Area: Natural Gas
Account: 89893-18003

Site: Floral Park-Bellerose
Meter: Admin Bldg Gas
Unit: Therm(Qty OnPk)





From	To	# Days	Reading	Incl?	HDD	CDD	Offset	Baseline	Deviation
06/30/18	07/31/18	32	7	☒	0.0	0.0	-	9	27.4%
08/01/18	08/29/18	29	7	☒	0.0	0.0	-	8	15.4%
08/30/18	09/28/18	30	9	☒	1.5	0.0	-	9	1.7%
09/29/18	10/29/18	31	109	☒	167.0	0.0	-	97	-11.2%
10/30/18	11/29/18	31	285	☒	513.5	0.0	-	280	-1.8%
11/30/18	12/31/18	32	359	☒	718.5	0.0	-	388	8.2%
01/01/19	01/30/19	30	462	☒	852.5	0.0	-	459	-0.7%
01/31/19	02/28/19	29	453	☒	824.5	0.0	-	444	-2.1%
03/01/19	03/29/19	29	370	☒	677.0	0.0	-	366	-1.2%
03/30/19	04/30/19	32	167	☒	292.0	0.0	-	163	-2.3%
05/01/19	06/03/19	34	70	☒	123.5	0.0	-	75	6.7%
06/04/19	06/28/19	25	7	☒	2.0	0.0	-	8	14.6%
Sum/Average/Max		**364**	**2,305**		**4172.0**	**0.0**	**-**	**2,305**	**0% +/- 5.4%**

Admin Bldg Gas (Account # 89893-18003): Tuning Period is 364 days from 6/30/2018 until 6/28/2019.

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

Baseline (Therm) = 0.28 x #Days + 0.53 x HDD

The Baseline Equation has a Net Mean Bias of 0% and a Monthly Mean Error of +/-5.4%. The underlying regression has a R^2=0.997

Baseline Costs are calculated using Average Total Cost/Consumption, but no less than $1.56/ 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.

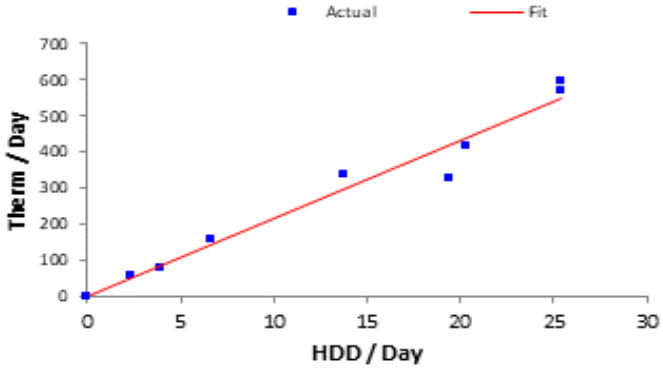
HDD = Heating Degree-Days calculated for NEW YORKNY for a 63.0 Fº balance point.

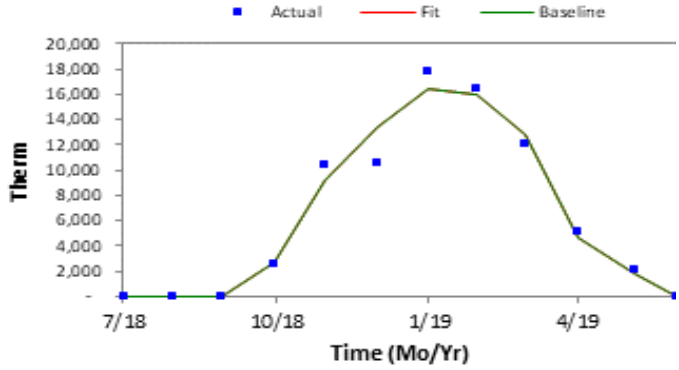
Multiplier is derived from Modification(s) in effect during the tuning period and is replicated annually for all future periods.

Meter Tuning Contract

Project: Floral Park-Bellerose
Area: Natural Gas
Account: 77421-40000

Site: Floral Park-Bellerose
Meter: FP ES Boiler - Gas
Unit: Therm(Qty OnPk)





From	To	# Days	Reading	Incl?	HDD	CDD	Offset	Baseline	Deviation
06/30/18	07/31/18	32	2	☒	0.0	0.0	-	39	1834.7%
08/01/18	08/29/18	29	-	☒	0.0	0.0	-	35	0.0%
08/30/18	09/28/18	30	1	☒	0.0	0.0	-	36	3527.5%
09/29/18	10/29/18	31	2,510	☒	120.5	0.0	-	2,632	4.9%
10/30/18	11/29/18	31	10,470	☒	426.5	0.0	-	9,222	-11.9%
11/30/18	12/31/18	32	10,479	☒	622.5	0.0	-	13,444	28.3%
01/01/19	01/30/19	30	17,832	☒	762.5	0.0	-	16,457	-7.7%
01/31/19	02/28/19	29	16,463	☒	737.5	0.0	-	15,917	-3.3%
03/01/19	03/29/19	29	12,075	☒	590.0	0.0	-	12,741	5.5%
03/30/19	04/30/19	32	5,067	☒	212.0	0.0	-	4,604	-9.1%
05/01/19	06/03/19	34	2,034	☒	80.5	0.0	-	1,775	-12.7%
06/04/19	06/28/19	25	-	☒	0.0	0.0	-	30	0.0%
Sum/Average/Max		**364**	**76,933**		**3552.0**	**0.0**	**-**	**76,933**	**0% +/- 17.1%**

FP ES Boiler - Gas (Account # 77421-40000): Tuning Period is 364 days from 6/30/2018 until 6/28/2019.

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

Baseline (Therm) = 1.21 x #Days + 21.54 x HDD

The Baseline Equation has a Net Mean Bias of 0% and a Monthly Mean Error of +/-17.1%. The underlying regression has a R^2=0.976

Baseline Costs are calculated using Average Total Cost/Consumption, but no less than $1.473/ 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.

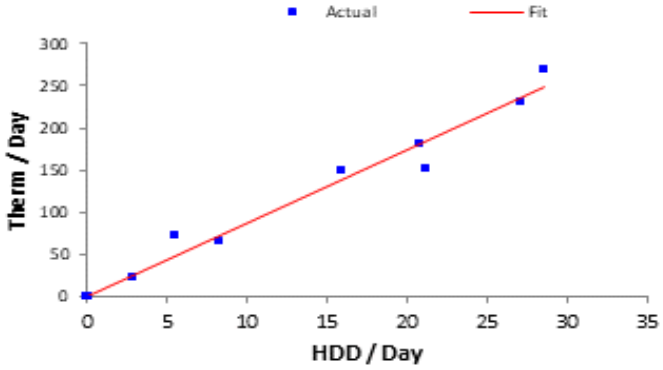
HDD = Heating Degree-Days calculated for NEW YORKNY for a 60.0 Fº balance point.

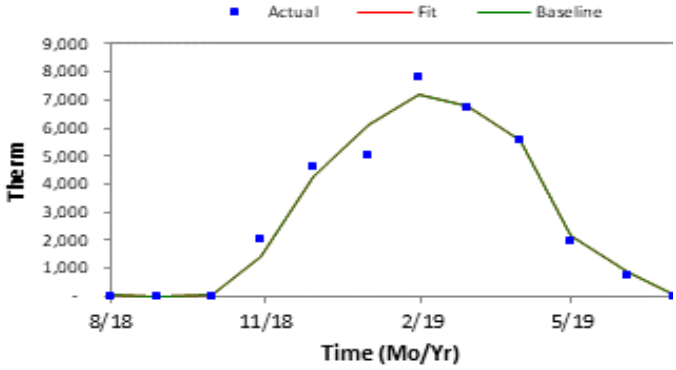
Multiplier is derived from Modification(s) in effect during the tuning period and is replicated annually for all future periods.

Meter Tuning Contract

Project: Floral Park-Bellerose
Area: Natural Gas
Account: 53565-91006

Site: Floral Park-Bellerose
Meter: JL Childs Boiler Gas
Unit: Therm(Qty OnPk)





From	To	# Days	Reading	Incl?	HDD	CDD	Offset	Baseline	Deviation
07/03/18	08/02/18	31	3	☒	0.0	0.0	-	26	777.1%
08/03/18	08/30/18	28	-	☒	0.0	0.0	-	24	0.0%
08/31/18	10/01/18	32	-	☒	0.0	0.0	-	27	0.0%
10/02/18	10/30/18	29	2,062	☒	159.0	0.0	-	1,396	-32.3%
10/31/18	11/30/18	31	4,627	☒	495.0	0.0	-	4,297	-7.1%
12/01/18	01/02/19	33	4,985	☒	700.5	0.0	-	6,071	21.8%
01/03/19	01/31/19	29	7,819	☒	830.0	0.0	-	7,185	-8.1%
02/01/19	03/01/19	29	6,700	☒	786.0	0.0	-	6,806	1.6%
03/02/19	04/01/19	31	5,573	☒	645.0	0.0	-	5,591	0.3%
04/02/19	05/01/19	30	1,974	☒	246.5	0.0	-	2,152	9.0%
05/02/19	06/04/19	34	738	☒	98.0	0.0	-	874	18.5%
06/05/19	07/01/19	27	-	☒	1.0	0.0	-	32	0.0%
Sum/Average/Max		**364**	**34,481**		**3961.0**	**0.0**	**-**	**34,481**	**0% +/- 15.6%**

JL Childs Boiler Gas (Account # 53565-91006): Tuning Period is 364 days from 7/3/2018 until 7/1/2019.

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

Baseline (Therm) = 0.85 x #Days + 8.63 x HDD

The Baseline Equation has a Net Mean Bias of 0% and a Monthly Mean Error of +/-15.6%. The underlying regression has a R^2=0.978

Baseline Costs are calculated using Average Total Cost/Consumption, but no less than $1.291/ 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 NEW YORKNY 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.

Exhibit D-5: Engineered Cost Avoidance Calculations

Floral Park-Bellerose UFSD
Exhibit D-5-Baseline
Utility Summary
FY 18/19

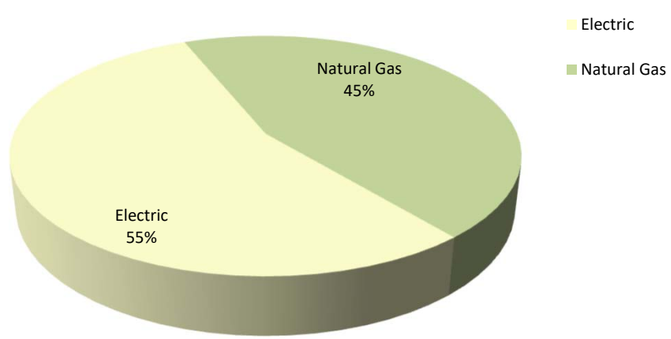
Building	Square Footage	Electric									Fuel Designation	Natural Gas				Total Thermal				Total Energy		
		Total Cost	Total kWh	Demand Cost	Misc. & Tax Costs	Total kW Demand	Demand Months	$/kW	$/kWh	$ per Square Ft	Main Heating Utility	Total Cost	Total Therms	$/Therm	$ per Square Ft	Total Cost	MMBtu/ Yr Total	$/MMBtu	$ per Square Ft	$/Sq ft	kBtu/sq ft	Total Cost
Administration Building	3,650	$ 5,340	23,060	$ 1,654	$ 237	115	12	$ 14.44	$ 0.150	$ 1.46	Natural Gas	$ 3,525	2,305	$ 1.53	$ 0.97	$ 3,525	231	$ 15.29	$ 0.97	$ 2.43	84.7	$ 8,865
Floral Park Elementary School	132,330	$ 69,620	362,640	$ 17,874	$ 7,443	1,568	11	$ 11.40	$ 0.122	$ 0.53	Natural Gas	$ 69,100	79,052	$ 0.87	$ 0.52	$ 69,100	7,905	$ 8.74	$ 0.52	$ 1.05	69.1	$ 138,719
John Lewis Childs School	77,920	$ 57,035	274,560	$ 17,773	$ 6,573	2,003	11	$ 8.88	$ 0.119	$ 0.73	Natural Gas	$ 35,656	37,356	$ 0.95	$ 0.46	$ 35,656	3,736	$ 9.54	$ 0.46	$ 1.19	60.0	$ 92,691
TOTALS	**213,900**	**$ 131,994**	**660,260**	**$ 37,300**	**$ 14,254**	**3,685**		**$ 10.12**	**$ 0.122**	**$ 0.62**		**$ 108,281**	**118,713**	**$ 0.91**	**$ 0.51**	**$ 108,281**	**11,871**	**$ 9.12**	**$ 0.51**	**$ 1.12**	**66.0**	**$ 240,275**

Electric	**$ 131,994**
Natural Gas	**$ 108,281**
Total	**$ 240,275**

Heating Content of Fuels

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

Utility Costs by Type



Floral Park-Bellerose UFSD
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	-	75.3	38.6	3
90 to 95	92.5	-	18	3	71.8	35.4	21
85 to 90	87.5	-	100	18	72.9	36.4	118
80 to 85	82.5	37	292	126	71.4	35.1	455
75 to 80	77.5	189	296	247	69.6	33.6	732
70 to 75	72.5	275	234	272	66.5	31.1	781
65 to 70	67.5	245	248	272	61.7	27.6	765
60 to 65	62.5	282	226	287	57.3	24.6	795
Total		**1,028**	**1,417**	**1,225**			**3,670**

JFK International Airport, NY
Cooling Months Only (April - September)

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

HEATING

JFK International Airport, NY
All Months

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

JFK International Airport, NY
Heating Months Only (October - March)

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

Floral Park-Bellerose UFSD
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
Administration Building	12:00 AM	12:00 AM	12:00 AM	12:00 AM		7:00 AM	5:00 PM		
Floral Park Elementary School	12:00 AM	12:00 AM	12:00 AM	12:00 AM		6:00 AM	6:00 PM		
John Lewis Childs School	12:00 AM	12:00 AM	12:00 AM	12:00 AM		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
8.0	8.0	8.0	8.0	8.0	8.0	1.00	1.00	1.00	1.0	8.0	1.0	-	-	-	0.09	0.71	0.09
8.0	8.0	8.0	8.0	8.0	8.0	1.00	1.00	1.00	2.0	8.0	2.0	-	-	-	0.18	0.71	0.18
8.0	8.0	8.0	8.0	8.0	8.0	1.00	1.00	1.00	2.0	8.0	2.0	-	-	-	0.18	0.71	0.18

Exhibit D-5: Engineered Cost Avoidance Calculations

Floral Park-Bellerose UFSD
Exhibit D-5-Summary
Energy Savings Summary

Utilities	Electric kWh	Electric kW	Natural Gas Therms	Fuel Oil Gallons	Propane Gallons	$/yr
Electric	660,260	3,685	-	-	-	$ 131,994
Natural Gas	-	-	118,713	-	-	$ 108,281
Fuel Oil	-	-	-	-	-	$ -
Propane	-	-	-	-	-	$ -
Total:	**660,260**	**3,685**	**118,713**	**-**	**-**	**$ 240,275**

GLOBAL SAFETY FACTORS*

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

*Applied over the entire project

GUARANTEED

	Savings	Baseline	
Electric	**$ 34,707**	**$ 131,994**	**26.3%**
Natural Gas	**$ 54,825**	**$ 108,281**	**50.6%**
Total	**$ 89,532**	**$ 240,275**	**37.3%**

GUARANTEED SAVINGS

				Guaranteed Energy Savings																					
				ELECTRIC						NATURAL GAS				FUEL OIL				PROPANE				WATER			
ECM No.	**Description**	**Total Guaranteed Energy Savings**	**% of Baseline Total Utility Cost**	**kWh Savings**	**kWh % Baseline**	**kW Savings**	**kW % of Baseline**	**Total $$ Savings**	**Electric $ % Baseline**	**Therm Savings**	**Therm % Baseline**	**Therm $$ Savings**	**Therm $ % Baseline**	**Gallon Savings**	**Gallon % Baseline**	**Gallon $$ Savings**	**Gallon $ % Baseline**	**Gallon Savings**	**Gallon % of Baseline**	**Gallon $$ Savings**	**Gallon $$ % Baseline**	**Propane Gallons**	**Propane Gallons % of Baseline**	**Water $$**	**Propane Gallons $ of Baseline**
1	LED Lighting and Lighting Controls Upgrade	$ 28,546	11.9%	181,791	27.5%	719.8	19.5%	$ 29,607	22.4%	(1,145)	-1.0%	$ (1,061)	-1.0%	-	#DIV/0!	$ -	#DIV/0!	-	0.0%	$ -	0.0%	-	0.0%	$ -	0.0%
2	Boiler Plant Upgrade	$ 1,530	0.6%	-	0.0%	-	0.0%	$ -	0.0%	1,603	1.4%	$ 1,530	1.4%	-	#DIV/0!	$ -	#DIV/0!	-	0.0%	$ -	0.0%	-	0.0%	$ -	0.0%
3	Building Management System Upgrades	$ 35,503	14.8%	41,721	6.3%	-	0.0%	$ 5,100	3.9%	33,310	28.1%	$ 30,403	28.1%	-	#DIV/0!	$ -	#DIV/0!	-	0.0%	$ -	0.0%	-	0.0%	$ -	0.0%
4	Install Pipe Insulation	$ 649	0.3%	-	0.0%	-	0.0%	$ -	0.0%	743	0.6%	$ 649	0.6%	-	#DIV/0!	$ -	#DIV/0!	-	0.0%	$ -	0.0%	-	0.0%	$ -	0.0%
5	Steam Trap Replacement	$ 23,304	9.7%	-	0.0%	-	0.0%	$ -	0.0%	25,382	21.4%	$ 23,304	21.5%	-	#DIV/0!	$ -	#DIV/0!	-	0.0%	$ -	0.0%	-	0.0%	$ -	0.0%
	Total:	**$ 89,532**	**37.3%**	**223,513**	**33.9%**	**719.8**	**19.5%**	**$ 34,707**	**26.3%**	**59,893**	**50.5%**	**$ 54,825**	**50.6%**	**-**	**#DIV/0!**	**$ -**	**#DIV/0!**	**-**	**0.0%**	**$ -**	**0.0%**	**-**	**0.0%**	**$ -**	**0.0%**

Floral Park-Bellerose UFSD
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	Administration Building	Floral Park Elementary School	John Lewis Childs School	Total
			2,305	79,052	37,356	118,713
	-	DHW Usage (% of Building Thermal Usage)	5.0%	5.0%	5.0%	1
		DHW Baseline	115	3,953	1,868	5,936
		Adjusted Baseline	2,190	75,099	35,488	112,777
y	1	ECM 1 - LED Lighting and Lighting Controls Upgrade	-27	-590	-528	-1,145
		Adjusted Baseline	2,217	75,690	36,016	113,922
y	4	ECM 4 - Install Pipe Insulation	0	743	0	743
		Adjusted Baseline	2,217	74,947	36,016	113,180
y	5	ECM 5 - Steam Trap Replacement	0	11,480	13,903	25,382
		Adjusted Baseline	2,217	63,468	22,113	87,797
n	3	ECM 3 - Building Management System Upgrades	0	0	0	0
		Adjusted Baseline	2,217	63,468	22,113	87,797
n	2	ECM 2 - Boiler Plant Upgrade	0	0	0	0
		Adjusted Baseline	2,217	63,468	22,113	87,797

Floral Park-Bellerose UFSD
Exhibit D-5-1
ECM 1 - LED Lighting and Lighting Controls Upgrade

ECM DESCRIPTION

Retrofit existing lighting fixtures with new energy efficient lighting fixtures, install motion sensors and implement daylight harvesting where applicable

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

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

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

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

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

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

Floral Park-Bellerose UFSD
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 [%]
Administration Building	7,339	-	2.7	80.3%
Floral Park Elementary School	89,834	-	31.4	76.7%
John Lewis Childs School	77,454	-	31.1	77.1%
Totals	174,627	-	65.2	

Floral Park-Bellerose UFSD
Exhibit D-5-1
ECM 1 - LED Lighting and Lighting Controls Upgrade

CALCULATIONS

	Administration Building	Elementary School	John Lewis Childs School
Lighting Derate [%]	0%	0%	0%
Lighting Savings [kWh]	7,339	89,834	77,454
kW Savings [kW]	2.7	31.4	31.1
Heating Season [Weeks/Year]	20	20	20
* % of Heating Season [%]	38%	38%	38%
**Fraction of Heat to be Made-Up [%]	40%	40%	40%
Equivalent of Lighting kWh Saved in Therms [Therms/Yr]	141	2,943	2,643
Proposed Boiler Efficiency [%]	80.3%	76.7%	77.1%
Heating Penalty [Therms]	(27)	(590)	(528)
Cooling Season [Weeks/Year]	16	16	16
% of Cooling Season [%]	31%	31%	31%
Fraction of Cooling Avoided [%]	40%	40%	40%
Cooling Equipment COP	3.0	3.0	3.0
Cooling Savings [kWh]	301	3,685	3,178

SAVINGS SUMMARY

Building ID	kWh Savings	kW Savings	Thermal Savings	Safety Factor
	kWh	kW	Therms	%
Administration Building	7,640	2.7	(27)	0.0%
Floral Park Elementary School	93,520	31.4	(590)	0.0%
John Lewis Childs School	80,632	31.1	(528)	0.0%
Subtotal	181,791	65.2	(1,145)	

Exhibit D-5: Engineered Cost Avoidance Calculations

Floral Park-Bellerose UFSD
Exhibit G-5-1
ECM 1 - LED Lighting and Lighting Controls Upgrade

Line #	SITE/ BUILDING	INT/ EXT	Floor/EXT	Annual Hours	Location Description	Switch	TYPE/ MOUNT	EXISTING CODE	Existing QTY	EXISTING TECH	Existing Watts	PROPOSED CODE	Proposal QTY	REMAIN	PROPOSED TECH	RETRO CODE	Proposed Watts	SENSORS REMAIN	Wattage Reduction percentage	UNIT WATT SAVINGS	EXISTING DESCRIPTION	EXISTING LAMP	E lamp total qty	EXISTING Ballast	E ballast total qty	Total kW Existing	Total kWh Existing	Total kW Proposed	Total kWh Proposed	Total kW Saved	Total kWh Saved
1	1 POPPY PLACE - ADMIN BLDG	INT	2	800	UPPEREND STORAGE			2424T8-28	1	T8-28	48	LED2X10.5TUBE4FT-DEP	1	1	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	1	0.0	38.4	0.0	17.3	0.0	21.1
2	1 POPPY PLACE - ADMIN BLDG	INT	2	1600	BATHROOM	OSW-1G		CF13	2	CFL	15	LED9A19	2	2	LED	LED-SI	9	0	40%	6	13 Watt CFL	Compact Fluorescent Lamp	2	0	0	0.0	48.0	0.0	28.8	0.0	19.2
3	1 POPPY PLACE - ADMIN BLDG	INT	2	800	MAP ROOM		WRAP	1414T8-28	1	T8-28	24	LED1X10.5TUBE4FT-DEP	1	1	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	1	T8 Elec Ballasts	1	0.0	19.2	0.0	8.6	0.0	10.6
4	1 POPPY PLACE - ADMIN BLDG	INT	2	2318	IT OFFICE	OSW-2G	WRAP	1424T8-28	2	T8-28	48	LED2X10.5TUBE4FT-DEP	2	2	LED	LED-RL	22	0	55%	26	1x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	4	T8 Elec Ballasts	2	0.1	222.5	0.0	100.1	0.1	122.4
5	1 POPPY PLACE - ADMIN BLDG	INT	2	2318	HALLWAY		WRAP	1414T8-28	2	T8-28	24	LED1X10.5TUBE4FT-DEP	2	2	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	2	0.0	111.3	0.0	50.1	0.0	61.2
6	1 POPPY PLACE - ADMIN BLDG	INT	2	800	UTILITY			2424T8-28	1	T8-28	48	LED2X10.5TUBE4FT-DEP	1	1	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	1	0.0	38.4	0.0	17.3	0.0	21.1
7	1 POPPY PLACE - ADMIN BLDG	INT	1	2318	OFFICE OF SUPERINTENDENT	OSW-1G		2424T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	667.6	0.1	300.4	0.2	367.2
8	1 POPPY PLACE - ADMIN BLDG	INT	1	2318	SUPERINTENENT RECEPTIONIST			2424T8-28	3	T8-28	48	LED2X10.5TUBE4FT-DEP	3	3	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	6	T8 Elec Ballasts	3	0.1	333.8	0.1	150.2	0.1	183.6
9	1 POPPY PLACE - ADMIN BLDG	INT	1	2318	LARGE CONFERNENCE ROOM	OSC-1D		2424T8-28	12	T8-28	48	LED2X10.5TUBE4FT-DEP	12	12	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	24	T8 Elec Ballasts	12	0.6	1335.2	0.3	600.8	0.3	734.3
10	1 POPPY PLACE - ADMIN BLDG	INT	1	8760	LARGE CONFERNENCE ROOM			KLED-BB	1	LED-EXIT	2	NR	1	1	NO CHANGE	NO CHANGE	2	0	0%	0	Exit Sign, Battery Backup, Universal, MultiTap	LED Lamp	0	0	0	0.0	17.5	0.0	17.5	0.0	0.0
11	1 POPPY PLACE - ADMIN BLDG	INT	1	2318	MAIN OPEN AREA			2424T8-28	14	T8-28	48	LED2X10.5TUBE4FT-DEP	14	14	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	28	T8 Elec Ballasts	14	0.7	1557.7	0.3	701.0	0.4	856.7
12	1 POPPY PLACE - ADMIN BLDG	INT	1	2318	OFFICE BUSINESS	OSC-1D		2424T8-28	4	T8-28	48	LED2X10.5TUBE4FT-DEP	4	4	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	8	T8 Elec Ballasts	4	0.2	445.1	0.1	200.3	0.1	244.8
13	1 POPPY PLACE - ADMIN BLDG	INT	1	2318	OFFICE ACCOUNTING	OSW-1G		2424T8-28	4	T8-28	48	LED2X10.5TUBE4FT-DEP	4	4	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	8	T8 Elec Ballasts	4	0.2	445.1	0.1	200.3	0.1	244.8
14	1 POPPY PLACE - ADMIN BLDG	INT	1	2318	COPY ROOM			2424T8-28	2	T8-28	48	LED2X10.5TUBE4FT-DEP	2	2	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	4	T8 Elec Ballasts	2	0.1	222.5	0.0	100.1	0.1	122.4
15	1 POPPY PLACE - ADMIN BLDG	INT	1	800	WOMENS BATHROOM	OSW-1G		2424T8-28	1	T8-28	48	LED2X10.5TUBE4FT-DEP	1	1	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	1	0.0	38.4	0.0	17.3	0.0	21.1
16	1 POPPY PLACE - ADMIN BLDG	INT	1	800	WOMENS BATHROOM			CF18	1	CFL	20	LED9A19	1	1	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	1	0	0	0.0	16.0	0.0	7.2	0.0	8.8
17	1 POPPY PLACE - ADMIN BLDG	INT	1	800	UTILITY / CUSTODIAL			CF18	1	CFL	20	LED9A19	1	1	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	1	0	0	0.0	16.0	0.0	7.2	0.0	8.8
18	1 POPPY PLACE - ADMIN BLDG	INT	1	1600	UTILITY SAFE ROOM	OSW-1G	8' WRAP	1824T8-28	1	T8-28	48	LED2X10.5TUBE4FT-DEP	1	1	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	1	0.0	76.8	0.0	34.6	0.0	42.2
19	1 POPPY PLACE - ADMIN BLDG	INT	1	2318	RECEPTION BUILDING & GROUNDS			2424T8-28	4	T8-28	48	LED2X10.5TUBE4FT-DEP	4	4	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	8	T8 Elec Ballasts	4	0.2	445.1	0.1	200.3	0.1	244.8
20	1 POPPY PLACE - ADMIN BLDG	INT	1	2318	OFFICE TRANSPORTATION	OSW-1G		2424T8-28	2	T8-28	48	LED2X10.5TUBE4FT-DEP	2	2	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	4	T8 Elec Ballasts	2	0.1	222.5	0.0	100.1	0.1	122.4
21	1 POPPY PLACE - ADMIN BLDG	INT	1	800	BATHROOM			2424T8-28	1	T8-28	48	LED2X10.5TUBE4FT-DEP	1	1	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	1	0.0	38.4	0.0	17.3	0.0	21.1
22	1 POPPY PLACE - ADMIN BLDG	INT	1	2318	ASSITANT SUPERINTENDENT	OSW-1G		2424T8-28	2	T8-28	48	LED2X10.5TUBE4FT-DEP	2	2	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	4	T8 Elec Ballasts	2	0.1	222.5	0.0	100.1	0.1	122.4
23	1 POPPY PLACE - ADMIN BLDG	INT	1	2318	OFFICE PAUL GUSTAFSON	OSW-1G		2424T8-28	3	T8-28	48	LED2X10.5TUBE4FT-DEP	3	3	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	6	T8 Elec Ballasts	3	0.1	333.8	0.1	150.2	0.1	183.6

Floral Park-Bellerose UFSD
Exhibit G-5-1
ECM 1 - LED Lighting and Lighting Controls Upgrade

Line #	SITE/ BUILDING	INT/ EXT	Floor/EXT	Annual Hours	Location Description	Switch	TYPE/ MOUNT	EXISTING CODE	Existing QTY	EXISTING TECH	Existing Watts	PROPOSED CODE	Proposal QTY	REMAIN	PROPOSED TECH	RETRO CODE	Proposed Watts	SENSORS REMAIN	Wattage Reduction percentage	UNIT WATT SAVINGS	EXISTING DESCRIPTION	EXISTING LAMP	E lamp total qty	EXISTING Ballast	E ballast total qty	Total kW Existing	Total kWh Existing	Total kW Proposed	Total kWh Proposed	Total kW Saved	Total kWh Saved
24	1 POPPY PLACE - ADMIN BLDG	INT	1	2318	CONFERENCE	OSC-1D		2434T8-28	3	T8-28	72	LED3X10.5TUBE4FT-DEP	3	3	LED	LED-RL	32	0	55%	40	2x4 fixture with (3) 4' Lamps T8 28W	T8 Lamps 4'	9	T8 Elec Ballasts	3	0.2	500.7	0.1	225.3	0.1	275.4
25	1 POPPY PLACE - ADMIN BLDG	INT	B	800	BASEMENT			2424T8-28	2	T8-28	48	LED2X10.5TUBE4FT-DEP	2	2	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	4	T8 Elec Ballasts	2	0.1	76.8	0.0	34.6	0.1	42.2
26	1 POPPY PLACE - ADMIN BLDG	INT	B	800	BASEMENT			CF18	2	CFL	20	LED9A19	2	2	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	2	0	0	0.0	32.0	0.0	14.4	0.0	17.6
27	1 POPPY PLACE - ADMIN BLDG	EXT	EXT	4380	CENTER ENT		DRUM	LED	1	LED	0	NR	1	1	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
28	1 POPPY PLACE - ADMIN BLDG	EXT	EXT	4380	FRONT LEFT		WP / PIPE	LS90	2	LPS	130	LED18CORNCOB	2	2	LED	LED-KIT	18	0	86%	112	90 Watt Low Pressure Sodium	Pressure Sodium Lamp	2	Pressure Sodium Ballasts	0	0.3	1138.8	0.0	157.7	0.2	981.1
29	1 POPPY PLACE - ADMIN BLDG	EXT	EXT	4380	COURTYARD SIDE		FLOOD / NIPPLE	S100	2	HPS	130	LED24CORNCOB	2	2	LED	LED-KIT	24	0	82%	106	100 Watt High Pressure Sodium	Pressure Sodium Lamp	2	Pressure Sodium Ballasts	2	0.3	1138.8	0.0	210.2	0.2	928.6
30	1 POPPY PLACE - ADMIN BLDG	EXT	EXT	4380	BACK EXIT		SQ DRUM	CF18	1	CFL	20	LED9A19	1	1	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	1	0	0	0.0	87.6	0.0	39.4	0.0	48.2
31	1 POPPY PLACE - ADMIN BLDG	EXT	EXT	4380	FRONT RIGHT		WP	LED	1	LED	0	NR	1	1	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
32	1 POPPY PLACE - ADMIN BLDG	EXT	EXT	4380	SCHOOL SIDE		WP / NIPPLE	S70	1	HPS	90	LED18CORNCOB	1	1	LED	LED-KIT	18	0	80%	72	70 Watt High Pressure Sodium	Pressure Sodium Lamp	1	Pressure Sodium Ballasts	1	0.1	394.2	0.0	78.8	0.1	315.4
33	1 POPPY PLACE - ADMIN BLDG	EXT	EXT	4380	SCHOOL SIDE		WP / WALL	S70	1	HPS	90	LED18CORNCOB	1	1	LED	LED-KIT	18	0	80%	72	70 Watt High Pressure Sodium	Pressure Sodium Lamp	1	Pressure Sodium Ballasts	1	0.1	394.2	0.0	78.8	0.1	315.4
34	1 POPPY PLACE - ADMIN BLDG	EXT	EXT	4380	FLAG		FLOOD / NIPPLE	LED	1	LED	0	NR	1	1	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
35	1 POPPY PLACE - ADMIN BLDG	EXT	EXT	4380	BACK		WP / WALL	S70	2	HPS	90	LED18CORNCOB	2	2	LED	LED-KIT	18	0	80%	72	70 Watt High Pressure Sodium	Pressure Sodium Lamp	2	Pressure Sodium Ballasts	2	0.2	788.4	0.0	157.7	0.1	630.7
36	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	1600	CLASS 219	OSC-1D	8' WRAP	1824T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4
37	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	2318	OFFICE 220	OSC-1D	WRAP	1414T8-28	3	T8-28	24	LED1X10.5TUBE4FT-DEP	3	3	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	3	T8 Elec Ballasts	3	0.1	166.9	0.0	75.1	0.0	91.8
38	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	4228	STAIRWELL		WRAP	1414T8-28	2	T8-28	24	LED1X10.5TUBE4FT-DEP	2	2	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	2	0.0	202.9	0.0	91.3	0.0	111.6
39	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	8760	STAIRWELL			KLED-BB	1	LED-EXIT	2	NR	1	1	NO CHANGE	NO CHANGE	2	0	0%	0	Exit Sign, Battery Backup, Universal, MultiTap	LED Lamp	0	0	0	0.0	17.5	0.0	17.5	0.0	0.0
40	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	4228	STAIRWELL			CF18	1	CFL	20	LED9A19	1	1	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	1	0	0	0.0	84.6	0.0	38.1	0.0	46.5
41	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	1600	CLASS 218	OSC-1D	8' WRAP	1824T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4
42	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	1600	CLASS 217	OSC-1D	8' WRAP	1824T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4
43	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	1600	CLASS 216	OSC-1D	8' WRAP	1824T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4
44	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	1600	CLASS 215	OSC-1D	8' WRAP	1824T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4
45	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	4228	HALLWAY			2424T8-28	5	T8-28	48	LED2X10.5TUBE4FT-DEP	5	5	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	10	T8 Elec Ballasts	5	0.2	1014.7	0.1	456.6	0.1	558.1
46	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	8760	HALLWAY			KLED-BB-FE	2	LED-EXIT	2	NR	2	2	NO CHANGE	NO CHANGE	2	0	0%	0	Install a new LED Exit Sign, Battery Backup, Frog Eyes	LED Lamp	0	0	0	0.0	35.0	0.0	35.0	0.0	0.0

Floral Park-Bellerose UFSD
Exhibit G-5-1
ECM 1 - LED Lighting and Lighting Controls Upgrade

Line #	SITE/ BUILDING	INT/ EXT	Floor/EXT	Annual Hours	Location Description	Switch	TYPE/ MOUNT	EXISTING CODE	Existing QTY	EXISTING TECH	Existing Watts	PROPOSED CODE	Proposal QTY	REMAIN	PROPOSED TECH	RETRO CODE	Proposed Watts	SENSORS REMAIN	Wattage Reduction percentage	UNIT WATT SAVINGS	EXISTING DESCRIPTION	EXISTING LAMP	E lamp total qty	EXISTING Ballast	E ballast total qty	Total kW Existing	Total kWh Existing	Total kW Proposed	Total kWh Proposed	Total kW Saved	Total kWh Saved
47	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	4228	STAIRWELL		WRAP	1414T8-28	3	T8-28	24	LED1X10.5TUBE4FT-DEP	3	3	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	3	T8 Elec Ballasts	3	0.1	304.4	0.0	137.0	0.0	167.4
48	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	4228	STAIRWELL			CF18	1	CFL	20	LED9A19	1	1	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	1	0	0	0.0	84.6	0.0	38.1	0.0	46.5
49	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	8760	STAIRWELL			KLED-BB	1	LED-EXIT	2	NR	1	1	NO CHANGE	NO CHANGE	2	0	0%	0	Exit Sign, Battery Backup, Universal, MultiTap	LED Lamp	0	0	0	0.0	17.5	0.0	17.5	0.0	0.0
50	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	1600	CLASS 214	OSC-2D-3P	8' WRAP	1824T8-28	12	T8-28	48	LED2X10.5TUBE4FT-DEP	12	12	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	24	T8 Elec Ballasts	12	0.6	921.6	0.3	414.7	0.3	506.9
51	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	1600	CLASS 213	OSC-1D	8' WRAP	1824T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4
52	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	1600	CLASS 212	OSC-1D	8' WRAP	1824T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4
53	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	2499	BATH GIRLS		2X4 SB	LED	4	LED	0	NR	4	4	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
54	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	2499	UTILITY IN GIRLS			CF18	1	CFL	20	LED9A19	1	1	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	1	0	0	0.0	50.0	0.0	22.5	0.0	27.5
55	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	2499	BATH BOYS		2X4 SB	LED	4	LED	0	NR	4	4	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
56	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	800	UTILITY IN HALLWAY			CF18	1	CFL	20	LED9A19	1	1	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	1	0	0	0.0	16.0	0.0	7.2	0.0	8.8
57	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	4228	STAIRWELL		WRAP	1414T8-28	3	T8-28	24	LED1X10.5TUBE4FT-DEP	3	3	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	3	T8 Elec Ballasts	3	0.1	304.4	0.0	137.0	0.0	167.4
58	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	8760	STAIRWELL			KLED-BB	1	LED-EXIT	2	NR	1	1	NO CHANGE	NO CHANGE	2	0	0%	0	Exit Sign, Battery Backup, Universal, MultiTap	LED Lamp	0	0	0	0.0	17.5	0.0	17.5	0.0	0.0
59	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	1600	CLASS 211	OSC-1D	8' WRAP	1824T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4
60	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	4228	SHORT HALLWAY		WRAP	1414T8-28	1	T8-28	24	LED1X10.5TUBE4FT-DEP	1	1	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	1	T8 Elec Ballasts	1	0.0	101.5	0.0	45.7	0.0	55.8
61	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	8760	UPPER BALCONY			LED	2	LED	0	NR	2	2	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
62	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	800	UPPER BALCONY			I60	16	INC	60	LED9A19	16	16	LED	LED-SI	9	0	85%	51	60 Watt Inc	Incandescent Lamp	16	In Lamp	0	1.0	768.0	0.1	115.2	0.8	652.8
63	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	3614	FACULTY LOUNGE 210		8' WRAP	1824T8-28	2	T8-28	48	LED2X10.5TUBE4FT-DEP	2	2	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	4	T8 Elec Ballasts	2	0.1	346.9	0.0	156.1	0.1	190.8
64	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	3614	FACULTY LOUNGE 210		WRAP	1414T8-28	4	T8-28	24	LED1X10.5TUBE4FT-DEP	4	4	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	4	T8 Elec Ballasts	4	0.1	346.9	0.0	156.1	0.1	190.8
65	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	3614	BATH IN LOUNGE 210	OSW-1G		2424T8-28	1	T8-28	48	LED2X10.5TUBE4FT-DEP	1	1	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	1	0.0	173.5	0.0	78.1	0.0	95.4
66	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	3614	BATH IN LOUNGE 210	OSW-1G		2424T8-28	1	T8-28	48	LED2X10.5TUBE4FT-DEP	1	1	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	1	0.0	173.5	0.0	78.1	0.0	95.4
67	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	800	UTILITIES IN 210			CF18	2	CFL	20	LED9A19	2	2	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	2	0	0	0.0	32.0	0.0	14.4	0.0	17.6
68	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	1600	UTILITY HALL			CF18	1	CFL	20	LED9A19	1	1	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	1	0	0	0.0	32.0	0.0	14.4	0.0	17.6
69	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	1600	CLASS 209	OSC-1D	8' WRAP	1824T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4

Floral Park-Bellerose UFSD
Exhibit G-5-1
ECM 1 - LED Lighting and Lighting Controls Upgrade

Line #	SITE/ BUILDING	INT/ EXT	Floor/EXT	Annual Hours	Location Description	Switch	TYPE/ MOUNT	EXISTING CODE	Existing QTY	EXISTING TECH	Existing Watts	PROPOSED CODE	Proposal QTY	REMAIN	PROPOSED TECH	RETRO CODE	Proposed Watts	SENSORS REMAIN	Wattage Reduction percentage	UNIT WATT SAVINGS	EXISTING DESCRIPTION	EXISTING LAMP	E lamp total qty	EXISTING Ballast	E ballast total qty	Total kW Existing	Total kWh Existing	Total kW Proposed	Total kWh Proposed	Total kW Saved	Total kWh Saved
70	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	4228	SHORT HALLWAY		WRAP	1414T8-28	1	T8-28	24	LED1X10.5TUBE4FT-DEP	1	1	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	1	T8 Elec Ballasts	1	0.0	101.5	0.0	45.7	0.0	55.8
71	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	3614	SHORT HALLWAY			KLED-BB-FE	1	LED-EXIT	2	NR	1	1	NO CHANGE	NO CHANGE	2	0	0%	0	Install a new LED Exit Sign, Battery Backup, Frog Eyes	LED Lamp	0	0	0	0.0	7.2	0.0	7.2	0.0	0.0
72	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	4228	STAIRWAY		WRAP	1414T8-28	3	T8-28	24	LED1X10.5TUBE4FT-DEP	3	3	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	3	T8 Elec Ballasts	3	0.1	304.4	0.0	137.0	0.0	167.4
73	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	1600	CLASS 208	OSC-1D	8' WRAP	1824T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4
74	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	1600	UTILITY IN HALL			CF18	1	CFL	20	LED9A19	1	1	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	1	0	0	0.0	32.0	0.0	14.4	0.0	17.6
75	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	2499	BATH GIRLS		FLAT PANEL BBU	LED	3	LED	0	NR	3	3	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
76	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	800	BATH GIRLS			2222T8	1	T8-17	37	LED2X9TUBE2FT-DEP	1	1	LED	LED-RL	19	0	48%	18	2x2 fixture with (2) 2' Lamps T8	T8 Lamps 2'	2	T8 Elec Ballasts	1	0.0	29.6	0.0	15.4	0.0	14.2
77	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	2499	BATH BOYS		FLAT PANEL BBU	LED	3	LED	0	NR	3	3	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
78	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	800	UTILITY IN BATH BOYS			CF18	1	CFL	20	LED9A19	1	1	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	1	0	0	0.0	16.0	0.0	7.2	0.0	8.8
79	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	3614	LIBRARY			2424T8-28	29	T8-28	48	LED2X10.5TUBE4FT-DEP	29	29	LED	LED-RL	22	1	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	58	T8 Elec Ballasts	29	1.4	5030.7	0.6	2263.8	0.8	2766.9
80	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	1600	CLASS 205	OSC-1D	8' WRAP	1824T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4
81	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	1600	CLASS 204	OSC-1D	8' WRAP	1824T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4
82	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	1600	CLASS 203	OSC-1D	8' WRAP	1824T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4
83	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	1600	CLASS 202	OSC-1D	8' WRAP	1824T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4
84	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	1600	CLASS 224	OSC-1D		2424T8-28	7	T8-28	48	LED2X10.5TUBE4FT-DEP	7	7	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	14	T8 Elec Ballasts	7	0.3	537.6	0.2	241.9	0.2	295.7
85	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	1600	CLASS 224	OSC-1D		2424T8-28	2	T8-28	48	LED2X10.5TUBE4FT-DEP	2	2	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	4	T8 Elec Ballasts	2	0.1	153.6	0.0	69.1	0.1	84.5
86	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	1600	CLASS 223	OSC-1D		2424T8-28	9	T8-28	48	LED2X10.5TUBE4FT-DEP	9	9	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	18	T8 Elec Ballasts	9	0.4	691.2	0.2	311.0	0.2	380.2
87	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	800	UTILITY		WRAP	1414T8-28	1	T8-28	24	LED1X10.5TUBE4FT-DEP	1	1	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	1	T8 Elec Ballasts	1	0.0	19.2	0.0	8.6	0.0	10.6
88	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	4228	STAIRWELL			2424T8-28	5	T8-28	48	LED2X10.5TUBE4FT-DEP	5	5	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	10	T8 Elec Ballasts	5	0.2	1014.7	0.1	456.6	0.1	558.1
89	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	4228	STAIRWELL			2424T8-28BBU	3	T8-28	48	LED2X12TUBE4FT-ED-BBU	3	3	LED	LED-L&D	24	0	49%	24	(2) 4' Lamps T8 28W, Battery Backup Unit	T8 Lamps 4'	6	T8 Elec Ballasts	3	0.1	608.8	0.1	309.5	0.1	299.3
90	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	1600	CLASS 221	OSW-1G		2424T8-28	3	T8-28	48	LED2X10.5TUBE4FT-DEP	3	3	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	6	T8 Elec Ballasts	3	0.1	230.4	0.1	103.7	0.1	126.7
91	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	1600	CLASS 222	OSC-1D		2424T8-28	9	T8-28	48	LED2X10.5TUBE4FT-DEP	9	9	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	18	T8 Elec Ballasts	9	0.4	691.2	0.2	311.0	0.2	380.2
92	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	1600	CLASS 201	OSC-1D	8' WRAP	1824T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4

Floral Park-Bellerose UFSD
Exhibit G-5-1
ECM 1 - LED Lighting and Lighting Controls Upgrade

Line #	SITE/ BUILDING	INT/ EXT	Floor/EXT	Annual Hours	Location Description	Switch	TYPE/ MOUNT	EXISTING CODE	Existing QTY	EXISTING TECH	Existing Watts	PROPOSED CODE	Proposal QTY	REMAIN	PROPOSED TECH	RETRO CODE	Proposed Watts	SENSORS REMAIN	Wattage Reduction percentage	UNIT WATT SAVINGS	EXISTING DESCRIPTION	EXISTING LAMP	E lamp total qty	EXISTING Ballast	E ballast total qty	Total kW Existing	Total kWh Existing	Total kW Proposed	Total kWh Proposed	Total kW Saved	Total kWh Saved
93	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	8760	HALLWAY AT 222			KLED-BB-FE	2	LED-EXIT	2	NR	2	2	NO CHANGE	NO CHANGE	2	0	0%	0	Install a new LED Exit Sign, Battery Backup, Frog Eyes	LED Lamp	0	0	0	0.0	35.0	0.0	35.0	0.0	0.0
94	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	4228	HALLWAY AT 222			2222T8	3	T8-17	37	LED2X9TUBE2FT-DEP	3	3	LED	LED-RL	19	0	48%	18	2x2 fixture with (2) 2' Lamps T8	T8 Lamps 2'	6	T8 Elec Ballasts	3	0.1	469.3	0.1	243.5	0.1	225.8
95	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	4228	STAIRWELL		WRAP	1414T8-28	2	T8-28	24	LED1X10.5TUBE4FT-DEP	2	2	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	2	0.0	202.9	0.0	91.3	0.0	111.6
96	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	4228	HALL AT ELEVATOR			2222T8	2	T8-17	37	LED2X9TUBE2FT-DEP	2	2	LED	LED-RL	19	0	48%	18	2x2 fixture with (2) 2' Lamps T8	T8 Lamps 2'	4	T8 Elec Ballasts	2	0.1	312.9	0.0	162.4	0.0	150.5
97	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	1600	CLASSROOM 97	OSC-1D		2424T8-28	10	T8-28	48	LED2X10.5TUBE4FT-DEP	10	10	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	20	T8 Elec Ballasts	10	0.5	768.0	0.2	345.6	0.3	422.4
98	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	1600	CLASSROOM 97 REAR		LONG NECK	CF18PAR38	2	CFL	20	LED14PAR38	2	2	LED	LED-SI	14	0	33%	7	18 Watt CFL, PAR 38	Compact Fluorescent Lamp	2	0	0	0.0	64.0	0.0	43.2	0.0	20.8
99	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	1600	CLASSROOM 97 STORAGE			CF18	1	CFL	20	LED9A19	1	1	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	1	0	0	0.0	32.0	0.0	14.4	0.0	17.6
100	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	1600	CLASSROOM 96	OSC-1D		2424T8-28	10	T8-28	48	LED2X10.5TUBE4FT-DEP	10	10	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	20	T8 Elec Ballasts	10	0.5	768.0	0.2	345.6	0.3	422.4
101	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	1800	CLASSROOM 96 REAR		LONG NECK	CF18PAR38	2	CFL	20	LED14PAR38	2	2	LED	LED-SI	14	0	33%	7	18 Watt CFL, PAR 38	Compact Fluorescent Lamp	2	0	0	0.0	72.0	0.0	48.6	0.0	23.4
102	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	1600	CLASSROOM 98	OSC-1D		2424T8-28	10	T8-28	48	LED2X10.5TUBE4FT-DEP	10	10	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	20	T8 Elec Ballasts	10	0.5	768.0	0.2	345.6	0.3	422.4
103	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	1800	CLASSROOM 98 REAR		LONG NECK	CF18PAR38	2	CFL	20	LED14PAR38	2	2	LED	LED-SI	14	0	33%	7	18 Watt CFL, PAR 38	Compact Fluorescent Lamp	2	0	0	0.0	72.0	0.0	48.6	0.0	23.4
104	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	1600	CLASSROOM 95	OSC-1D		2424T8-28	12	T8-28	48	LED2X10.5TUBE4FT-DEP	12	12	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	24	T8 Elec Ballasts	12	0.6	921.6	0.3	414.7	0.3	506.9
105	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	1800	CLASSROOM 95 REAR		LONG NECK	CF18PAR38	2	CFL	20	LED14PAR38	2	2	LED	LED-SI	14	0	33%	7	18 Watt CFL, PAR 38	Compact Fluorescent Lamp	2	0	0	0.0	72.0	0.0	48.6	0.0	23.4
106	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	1600	CLASSROOM 95 STORAGE			CF18	1	CFL	20	LED9A19	1	1	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	1	0	0	0.0	32.0	0.0	14.4	0.0	17.6
107	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	3614	HALLWAY CLASS 95-98			2424T8-28	8	T8-28	48	LED2X10.5TUBE4FT-DEP	8	8	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	16	T8 Elec Ballasts	8	0.4	1387.8	0.2	624.5	0.2	763.3
108	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	8760	EXIT AT STARIS			KLED-BB-FE	1	LED-EXIT	2	NR	1	1	NO CHANGE	NO CHANGE	2	0	0%	0	Install a new LED Exit Sign, Battery Backup, Frog Eyes	LED Lamp	0	0	0	0.0	17.5	0.0	17.5	0.0	0.0
109	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	8760	STAIRWELL REAR			KLED-BB-FE	1	LED-EXIT	2	NR	1	1	NO CHANGE	NO CHANGE	2	0	0%	0	Install a new LED Exit Sign, Battery Backup, Frog Eyes	LED Lamp	0	0	0	0.0	17.5	0.0	17.5	0.0	0.0
110	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	3614	STAIRWELL REAR			2222T8	1	T8-17	37	LED2X9TUBE2FT-DEP	1	1	LED	LED-RL	19	0	48%	18	2x2 fixture with (2) 2' Lamps T8	T8 Lamps 2'	2	T8 Elec Ballasts	1	0.0	133.7	0.0	69.4	0.0	64.3
111	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	4228	STAIRWELL REAR			2424T8-28	2	T8-28	48	LED2X10.5TUBE4FT-DEP	2	2	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	4	T8 Elec Ballasts	2	0.1	405.9	0.0	182.6	0.1	223.2
112	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	8760	HALLWAY ENTRY			KLED-BB-FE	2	LED-EXIT	2	NR	2	2	NO CHANGE	NO CHANGE	2	0	0%	0	Install a new LED Exit Sign, Battery Backup, Frog Eyes	LED Lamp	0	0	0	0.0	35.0	0.0	35.0	0.0	0.0
113	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	3614	HALLWAY ENTRY			2222T8	6	T8-17	37	LED2X9TUBE2FT-DEP	6	6	LED	LED-RL	19	0	48%	18	2x2 fixture with (2) 2' Lamps T8	T8 Lamps 2'	12	T8 Elec Ballasts	6	0.2	802.3	0.1	416.3	0.1	386.0
114	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	4228	HALLWAY ENTRY		LONG NECK	CF18PAR38	2	CFL	20	LED14PAR38	2	2	LED	LED-SI	14	0	33%	7	18 Watt CFL, PAR 38	Compact Fluorescent Lamp	2	0	0	0.0	169.1	0.0	114.2	0.0	55.0
115	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	4228	HALLWAY Main			2424T8-28	20	T8-28	48	LED2X10.5TUBE4FT-DEP	20	20	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	40	T8 Elec Ballasts	20	1.0	4058.9	0.4	1826.5	0.5	2232.4

Floral Park-Bellerose UFSD
Exhibit G-5-1
ECM 1 - LED Lighting and Lighting Controls Upgrade

Line #	SITE/ BUILDING	INT/ EXT	Floor/EXT	Annual Hours	Location Description	Switch	TYPE/ MOUNT	EXISTING CODE	Existing QTY	EXISTING TECH	Existing Watts	PROPOSED CODE	Proposal QTY	REMAIN	PROPOSED TECH	RETRO CODE	Proposed Watts	SENSORS REMAIN	Wattage Reduction percentage	UNIT WATT SAVINGS	EXISTING DESCRIPTION	EXISTING LAMP	E lamp total qty	EXISTING Ballast	E ballast total qty	Total kW Existing	Total kWh Existing	Total kW Proposed	Total kWh Proposed	Total kW Saved	Total kWh Saved
116	FLORAL PARK / BELLROSE ELEMENTARY	INT	2	8760	HALLWAY Main			KLED-BB-FE	6	LED-EXIT	2	NR	6	6	NO CHANGE	NO CHANGE	2	0	0%	0	Install a new LED Exit Sign, Battery Backup, Frog Eyes	LED Lamp	0	0	0	0.0	105.1	0.0	105.1	0.0	0.0
117	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	1600	CLASS 118	OSC-1D	8' WRAP	1824T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4
118	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	2318	OFFICE 120	OSW-1G	WRAP	1414T8-28	3	T8-28	24	LED1X10.5TUBE4FT-DEP	3	3	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	3	T8 Elec Ballasts	3	0.1	166.9	0.0	75.1	0.0	91.8
119	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	1600	CLASS 117	OSC-1D	8' WRAP	1824T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4
120	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	4228	HALLWAY			2424T8-28	5	T8-28	48	LED2X10.5TUBE4FT-DEP	5	5	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	10	T8 Elec Ballasts	5	0.2	1014.7	0.1	456.6	0.1	558.1
121	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	8760	HALLWAY			KLED-BB-FE	2	LED-EXIT	2	NR	2	2	NO CHANGE	NO CHANGE	2	0	0%	0	Install a new LED Exit Sign, Battery Backup, Frog Eyes	LED Lamp	0	0	0	0.0	35.0	0.0	35.0	0.0	0.0
122	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	1600	CLASS SPEECH 116A	OSW-1G	WRAP	1414T8-28	2	T8-28	24	LED1X10.5TUBE4FT-DEP	2	2	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	2	0.0	76.8	0.0	34.6	0.0	42.2
123	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	1600	CLASS 116	OSC-1D	8' WRAP	1824T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4
124	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	1600	CLASS 116 UTILITY			CF18	1	CFL	20	LED9A19	1	1	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	1	0	0	0.0	32.0	0.0	14.4	0.0	17.6
125	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	2499	BATH IN 116	OSW-1G	WRAP	1414T8-28	1	T8-28	24	LED1X10.5TUBE4FT-DEP	1	1	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	1	T8 Elec Ballasts	1	0.0	60.0	0.0	27.0	0.0	33.0
126	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	1600	CLASS 114	OSC-1D	8' WRAP	1824T8-28	9	T8-28	48	LED2X10.5TUBE4FT-DEP	9	9	LED	LED-RL	22	1	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	18	T8 Elec Ballasts	9	0.4	691.2	0.2	311.0	0.2	380.2
127	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	2499	BATH IN 114		WRAP	1414T8-28	1	T8-28	24	LED1X10.5TUBE4FT-DEP	1	1	LED	LED-RL	11	1	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	1	T8 Elec Ballasts	1	0.0	60.0	0.0	27.0	0.0	33.0
128	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	1600	CLASS 113	OSC-1D	8' WRAP	1824T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4
129	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	1600	CLASS 115	OSC-1D	8' WRAP	1824T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4
130	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	1600	CONFERENCE 112	OSC-1D	8' WRAP	1824T8-28	2	T8-28	48	LED2X10.5TUBE4FT-DEP	2	2	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	4	T8 Elec Ballasts	2	0.1	153.6	0.0	69.1	0.1	84.5
131	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	2499	BATH GIRLS		2X4 SB	LED	3	LED	0	NR	3	3	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
132	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	2499	UTILITY IN BATH GIRLS			CF18	2	CFL	20	LED9A19	2	2	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	2	0	0	0.0	100.0	0.0	45.0	0.0	55.0
133	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	2499	BATH BOYS		2X4 SB	LED	3	LED	0	NR	3	3	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
134	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	3614	COPY ROOM 112A	OSC-2D	8' WRAP	1824T8-28	1	T8-28	48	LED2X10.5TUBE4FT-DEP	1	1	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	1	0.0	173.5	0.0	78.1	0.0	95.4
135	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	3614	ASST PRINCIPAL 112A		8' WRAP	1824T8-28	1	T8-28	48	LED2X10.5TUBE4FT-DEP	1	1	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	1	0.0	173.5	0.0	78.1	0.0	95.4
136	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	800	BATH IN 112A			CF13	1	CFL	15	LED9A19	1	1	LED	LED-SI	9	0	40%	6	13 Watt CFL	Compact Fluorescent Lamp	1	0	0	0.0	12.0	0.0	7.2	0.0	4.8
137	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	1600	CUSTODIAL UTILITY IN HALL			CF18	1	CFL	20	LED9A19	1	1	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	1	0	0	0.0	32.0	0.0	14.4	0.0	17.6
138	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	3614	OFFICE AT PRINCIPAL		8' WRAP	1824T8-28	4	T8-28	48	LED2X10.5TUBE4FT-DEP	4	4	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	8	T8 Elec Ballasts	4	0.2	693.9	0.1	312.2	0.1	381.6

Floral Park-Bellerose UFSD
Exhibit G-5-1
ECM 1 - LED Lighting and Lighting Controls Upgrade

Line #	SITE/ BUILDING	INT/ EXT	Floor/EXT	Annual Hours	Location Description	Switch	TYPE/ MOUNT	EXISTING CODE	Existing QTY	EXISTING TECH	Existing Watts	PROPOSED CODE	Proposal QTY	REMAIN	PROPOSED TECH	RETRO CODE	Proposed Watts	SENSORS REMAIN	Wattage Reduction percentage	UNIT WATT SAVINGS	EXISTING DESCRIPTION	EXISTING LAMP	E lamp total qty	EXISTING Ballast	E ballast total qty	Total kW Existing	Total kWh Existing	Total kW Proposed	Total kWh Proposed	Total kW Saved	Total kWh Saved
139	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	800	BATH IN OFFICE AT PRINCIPAL			I2X60	2	INC	120	LED2X9A19	2	2	LED	LED-SI	18	0	85%	102	(2) 60 Watt Inc	Incandescent Lamp	4	In Lamp	0	0.2	192.0	0.0	28.8	0.2	163.2
140	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	3614	OFFICE PRINCIPAL	OSC-1D		CF13	2	CFL	15	LED9A19	2	2	LED	LED-SI	9	0	40%	6	13 Watt CFL	Compact Fluorescent Lamp	2	0	0	0.0	108.4	0.0	65.1	0.0	43.4
141	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	2318	OFFICE 110	OSC-1D	2X2 FLAT PANEL	LED	3	LED	0	NR	3	3	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
142	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	2499	STAFF RR		2X2 FLAT PANEL	LED	1	LED	0	NR	1	1	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
143	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	2318	HEALTH ROOM 109	OSC-1D		2424T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	667.6	0.1	300.4	0.2	367.2
144	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	2318	HEALTH ROOM 109	OSC-1D		2222T8	2	T8-17	37	LED2X9TUBE2FT-DEP	2	2	LED	LED-RL	19	0	48%	18	2x2 fixture with (2) 2' Lamps T8	T8 Lamps 2'	4	T8 Elec Ballasts	2	0.1	171.5	0.0	89.0	0.0	82.5
145	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	2318	HEALTH OFFICE		8" RC	PL2X26	2	CFL	54	LED8RC6-TK	2	2	LED	LED-KIT	8	0	85%	46	(2) 26 Watt CFL Plug In, 2 Pin	Compact Fluorescent Lamp	4	0	0	0.1	250.3	0.0	37.1	0.1	213.3
146	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	2318	BATH IN 109	OSW-1G	2X2 FLAT PANEL	LED	1	LED	0	NR	1	1	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
147	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	1600	CLASS 108	OSC-1D	8' WRAP	1824T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4
148	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	1600	UTILITY/CUSTODIAL			CF18	1	CFL	20	LED9A19	1	1	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	1	0	0	0.0	32.0	0.0	14.4	0.0	17.6
149	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	2499	BATH GIRLS			2424T8-28	3	T8-28	48	LED2X10.5TUBE4FT-DEP	3	3	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	6	T8 Elec Ballasts	3	0.1	359.9	0.1	161.9	0.1	197.9
150	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	2499	BATH GIRLS			CF18	1	CFL	20	LED9A19	1	1	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	1	0	0	0.0	50.0	0.0	22.5	0.0	27.5
151	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	800	BATH GIRLS			2222T8	1	T8-17	37	LED2X9TUBE2FT-DEP	1	1	LED	LED-RL	19	0	48%	18	2x2 fixture with (2) 2' Lamps T8	T8 Lamps 2'	2	T8 Elec Ballasts	1	0.0	29.6	0.0	15.4	0.0	14.2
152	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	2499	BATH BOYS			2424T8-28	4	T8-28	48	LED2X10.5TUBE4FT-DEP	4	4	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	8	T8 Elec Ballasts	4	0.2	479.8	0.1	215.9	0.1	263.9
153	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	2499	BATH BOYS			CF18	1	CFL	20	LED9A19	1	1	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	1	0	0	0.0	50.0	0.0	22.5	0.0	27.5
154	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	800	UTILITY IN BATH BOYS			CF18	1	CFL	20	LED9A19	1	1	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	1	0	0	0.0	16.0	0.0	7.2	0.0	8.8
155	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	1600	CLASS 107	OSC-1D	8' WRAP	1824T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4
156	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	1600	CLASS 105	OSC-1D-3P	8' WRAP	1824T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4
157	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	1600	CLASS 104	OSC-1D-3P	8' WRAP	1824T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4
158	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	1600	CLASS 106	OSC-2D-3P	8' WRAP	1824T8-28	9	T8-28	48	LED2X10.5TUBE4FT-DEP	9	9	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	18	T8 Elec Ballasts	9	0.4	691.2	0.2	311.0	0.2	380.2
159	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	1600	CLASS 103	OSC-1D	8' WRAP	1824T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4
160	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	1600	CLASS 102	OSC-1D	8' WRAP	1824T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4
161	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	1600	CLASS 101	OSC-1D	8' WRAP	1824T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4

Floral Park-Bellerose UFSD
Exhibit G-5-1
ECM 1 - LED Lighting and Lighting Controls Upgrade

Line #	SITE/ BUILDING	INT/ EXT	Floor/EXT	Annual Hours	Location Description	Switch	TYPE/ MOUNT	EXISTING CODE	Existing QTY	EXISTING TECH	Existing Watts	PROPOSED CODE	Proposal QTY	REMAIN	PROPOSED TECH	RETRO CODE	Proposed Watts	SENSORS REMAIN	Wattage Reduction percentage	UNIT WATT SAVINGS	EXISTING DESCRIPTION	EXISTING LAMP	E lamp total qty	EXISTING Ballast	E ballast total qty	Total kW Existing	Total kWh Existing	Total kW Proposed	Total kWh Proposed	Total kW Saved	Total kWh Saved
162	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	1600	CLASS 122	OSC-1D		2424T8-28	9	T8-28	48	LED2X10.5TUBE4FT-DEP	9	9	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	18	T8 Elec Ballasts	9	0.4	691.2	0.2	311.0	0.2	380.2
163	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	1600	CLASS 124	OSC-1D		2424T8-28	9	T8-28	48	LED2X10.5TUBE4FT-DEP	9	9	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	18	T8 Elec Ballasts	9	0.4	691.2	0.2	311.0	0.2	380.2
164	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	1600	CLASS 123	OSC-1D		2424T8-28	9	T8-28	48	LED2X10.5TUBE4FT-DEP	9	9	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	18	T8 Elec Ballasts	9	0.4	691.2	0.2	311.0	0.2	380.2
165	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	1600	CLASS 121	OSW-1G		2424T8-28	3	T8-28	48	LED2X10.5TUBE4FT-DEP	3	3	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	6	T8 Elec Ballasts	3	0.1	230.4	0.1	103.7	0.1	126.7
166	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	2318	OFFICE MS PLANK	OSW-1G	WRAP	1414T8-28	1	T8-28	24	LED1X10.5TUBE4FT-DEP	1	1	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	1	T8 Elec Ballasts	1	0.0	55.6	0.0	25.0	0.0	30.6
167	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	800	BATH IN OFFICE		6" DRUM	LED	1	LED	0	NR	1	1	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
168	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	3614	GYM	FMS-277	HB	1444T5HO	15	T5HO-54	234	LED4X25TUBE T54FT-SOCKETS	15	15	LED	LED-RL-SCKTS	100	0	57%	134	1x4 fixture with (4) 4' Lamps T5 High Output	T5 Lamps 4' HO	60	T5 Elec Ballasts	0	3.5	12685.1	1.5	5421.0	2.0	7264.1
169	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	8760	GYM			KLED-BB-FE	2	LED-EXIT	2	NR	2	2	NO CHANGE	NO CHANGE	2	0	0%	0	Install a new LED Exit Sign, Battery Backup, Frog Eyes	LED Lamp	0	0	0	0.0	35.0	0.0	35.0	0.0	0.0
170	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	800	REAR EXIT IN GYM			CF18	2	CFL	20	LED9A19	2	2	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	2	0	0	0.0	32.0	0.0	14.4	0.0	17.6
171	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	1600	LOWER GYM STORAGE	OSW-1G	WRAP	1414T8-28	3	T8-28	24	LED1X10.5TUBE4FT-DEP	3	3	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	3	T8 Elec Ballasts	3	0.1	115.2	0.0	51.8	0.0	63.4
172	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	800	UPPER LOCKER GIRLS			CF18	4	CFL	20	LED9A19	4	4	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	4	0	0	0.1	64.0	0.0	28.8	0.0	35.2
173	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	800	UPPER LOCKER BOYS			CF18	4	CFL	20	LED9A19	4	4	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	4	0	0	0.1	64.0	0.0	28.8	0.0	35.2
174	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	4228	HALLWAY AROUND AUTITORIUM		WRAP	1414T8-28	13	T8-28	24	LED1X10.5TUBE4FT-DEP	13	13	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	13	T8 Elec Ballasts	13	0.3	1319.1	0.1	593.6	0.2	725.5
175	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	8760	HALLWAY AROUND AUTITORIUM			KLED-BB-FE	4	LED-EXIT	2	NR	4	4	NO CHANGE	NO CHANGE	2	0	0%	0	Install a new LED Exit Sign, Battery Backup, Frog Eyes	LED Lamp	0	0	0	0.0	70.1	0.0	70.1	0.0	0.0
176	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	8760	HALLWAY AROUND AUTITORIUM			LED	1	LED	0	NR	1	1	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
177	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	800	HALLWAY AROUND AUTITORIUM			CF13	1	CFL	15	LED9A19	1	1	LED	LED-SI	9	0	40%	6	13 Watt CFL	Compact Fluorescent Lamp	1	0	0	0.0	12.0	0.0	7.2	0.0	4.8
178	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	3614	AUDITORIUM		BLUNT / CHANDELIER	CF14	24	CFL	16	LED4.5B10	24	24	LED	LED-SI	5	0	72%	12	14 Watt CLF	Compact Fluorescent Lamp	24	0	0	0.4	1387.8	0.1	390.3	0.3	997.5
179	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	8760	AUDITORIUM		SCONCE	CF14	8	CFL	16	LED4.5B10	8	8	LED	LED-SI	5	0	72%	12	14 Watt CLF	Compact Fluorescent Lamp	8	0	0	0.1	1121.3	0.0	315.4	0.1	805.9
180	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	8760	AUDITORIUM			KLED-BB-FE	2	LED-EXIT	2	NR	2	2	NO CHANGE	NO CHANGE	2	0	0%	0	Install a new LED Exit Sign, Battery Backup, Frog Eyes	LED Lamp	0	0	0	0.0	35.0	0.0	35.0	0.0	0.0
181	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	8760	AUDITORIUM		DECO DRUM	I4X40	14	INC	160	LED4X5.5A19	14	14	LED	LED-SI	22	0	86%	138	(4) 40 Watt Inc	Incandescent Lamp	56	In Lamp	0	2.2	19622.4	0.3	2698.1	1.9	16924.3
182	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	1600	STAGE			CF18PAR38	4	CFL	20	LED14PAR38	4	4	LED	LED-SI	14	0	33%	7	18 Watt CFL, PAR 38	Compact Fluorescent Lamp	4	0	0	0.1	128.0	0.1	86.4	0.0	41.6
183	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	1600	STAGE LIGHTING			I60BLUE	20	INC	60	LED8.5A19BLUE	20	20	LED	LED-SI	9	0	86%	52	60 Watt Inc, BLUE	Incandescent Lamp	20	In Lamp	0	1.2	1920.0	0.2	272.0	1.0	1648.0
184	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	1600	STAGE LIGHTING			I60RED	20	INC	60	LED8.5A19RED	20	20	LED	LED-SI	9	0	86%	52	60 Watt Inc, RED	Incandescent Lamp	20	In Lamp	0	1.2	1920.0	0.2	272.0	1.0	1648.0

Floral Park-Bellerose UFSD
Exhibit G-5-1
ECM 1 - LED Lighting and Lighting Controls Upgrade

Line #	SITE/ BUILDING	INT/ EXT	Floor/EXT	Annual Hours	Location Description	Switch	TYPE/ MOUNT	EXISTING CODE	Existing QTY	EXISTING TECH	Existing Watts	PROPOSED CODE	Proposal QTY	REMAIN	PROPOSED TECH	RETRO CODE	Proposed Watts	SENSORS REMAIN	Wattage Reduction percentage	UNIT WATT SAVINGS	EXISTING DESCRIPTION	EXISTING LAMP	E lamp total qty	EXISTING Ballast	E ballast total qty	Total kW Existing	Total kWh Existing	Total kW Proposed	Total kWh Proposed	Total kW Saved	Total kWh Saved
185	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	1600	STAGE LIGHTING			I60	20	INC	60	LED9A19	20	20	LED	LED-SI	9	0	85%	51	60 Watt Inc	Incandescent Lamp	20	In Lamp	0	1.2	1920.0	0.2	288.0	1.0	1632.0
186	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	1600	STAGE SIDES			2424T8-28	2	T8-28	48	LED2X10.5TUBE4FT-DEP	2	2	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	4	T8 Elec Ballasts	2	0.1	153.6	0.0	69.1	0.1	84.5
187	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	4228	HALLWAY AT 122			2222T8	5	T8-17	37	LED2X9TUBE2FT-DEP	5	5	LED	LED-RL	19	0	48%	18	2x2 fixture with (2) 2' Lamps T8	T8 Lamps 2'	10	T8 Elec Ballasts	5	0.2	782.2	0.1	405.9	0.1	376.3
188	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	8760	HALLWAY AT 122			KLED-BB-FE	2	LED-EXIT	2	NR	2	2	NO CHANGE	NO CHANGE	2	0	0%	0	Install a new LED Exit Sign, Battery Backup, Frog Eyes	LED Lamp	0	0	0	0.0	35.0	0.0	35.0	0.0	0.0
189	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	4228	HALLWAY AT MUSIC 100			2222T8	2	T8-17	37	LED2X9TUBE2FT-DEP	2	2	LED	LED-RL	19	0	48%	18	2x2 fixture with (2) 2' Lamps T8	T8 Lamps 2'	4	T8 Elec Ballasts	2	0.1	312.9	0.0	162.4	0.0	150.5
190	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	4228	HALLWAY AT MUSIC 100			2222T8	12	T8-17	37	LED2X9TUBE2FT-DEP	12	12	LED	LED-RL	19	0	48%	18	2x2 fixture with (2) 2' Lamps T8	T8 Lamps 2'	24	T8 Elec Ballasts	12	0.4	1877.2	0.2	974.1	0.2	903.1
191	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	8760	HALLWAY AT MUSIC 100			KLED-BB-FE	3	LED-EXIT	2	NR	3	3	NO CHANGE	NO CHANGE	2	0	0%	0	Install a new LED Exit Sign, Battery Backup, Frog Eyes	LED Lamp	0	0	0	0.0	52.6	0.0	52.6	0.0	0.0
192	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	8760	HALLWAY AT MUSIC 100			KLED-BB	1	LED-EXIT	2	NR	1	1	NO CHANGE	NO CHANGE	2	0	0%	0	Exit Sign, Battery Backup, Universal, MultiTap	LED Lamp	0	0	0	0.0	17.5	0.0	17.5	0.0	0.0
193	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	800	HALLWAY AT MUSIC 100 UTILITY			CF18	1	CFL	20	LED9A19	1	1	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	1	0	0	0.0	16.0	0.0	7.2	0.0	8.8
194	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	2499	BATH GIRLS	OSC-1D		2424T8-28	1	T8-28	48	LED2X10.5TUBE4FT-DEP	1	1	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	1	0.0	120.0	0.0	54.0	0.0	66.0
195	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	2499	BATH GIRLS			1414T8-28	1	T8-28	24	LED1X10.5TUBE4FT-DEP	1	1	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	1	T8 Elec Ballasts	1	0.0	60.0	0.0	27.0	0.0	33.0
196	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	1600	MUSIC ROOM 100	OSC-2D-2P		2424T8-28	12	T8-28	48	LED2X10.5TUBE4FT-DEP	12	12	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	24	T8 Elec Ballasts	12	0.6	921.6	0.3	414.7	0.3	506.9
197	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	800	UTILITY			CF18	1	CFL	20	LED9A19	1	1	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	1	0	0	0.0	16.0	0.0	7.2	0.0	8.8
198	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	1600	MUSIC ROOM 99	OSC-2D-2P		2424T8-28	12	T8-28	48	LED2X10.5TUBE4FT-DEP	12	12	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	24	T8 Elec Ballasts	12	0.6	921.6	0.3	414.7	0.3	506.9
199	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	2499	BATH BOYS	OSC-1D		2424T8-28	1	T8-28	48	LED2X10.5TUBE4FT-DEP	1	1	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	1	0.0	120.0	0.0	54.0	0.0	66.0
200	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	2499	BATH BOYS			1414T8-28	1	T8-28	24	LED1X10.5TUBE4FT-DEP	1	1	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	1	T8 Elec Ballasts	1	0.0	60.0	0.0	27.0	0.0	33.0
201	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	8760	HALLWAY TO GYM			KLED-BB	1	LED-EXIT	2	NR	1	1	NO CHANGE	NO CHANGE	2	0	0%	0	Exit Sign, Battery Backup, Universal, MultiTap	LED Lamp	0	0	0	0.0	17.5	0.0	17.5	0.0	0.0
202	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	4228	HALLWAY TO GYM			2424T8-28	2	T8-28	48	LED2X10.5TUBE4FT-DEP	2	2	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	4	T8 Elec Ballasts	2	0.1	405.9	0.0	182.6	0.1	223.2
203	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	2318	OFFICE 93	OSW-1G		2424T8-28	3	T8-28	48	LED2X10.5TUBE4FT-DEP	3	3	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	6	T8 Elec Ballasts	3	0.1	333.8	0.1	150.2	0.1	183.6
204	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	2318	OFFICE 92	OSW-1G		2424T8-28	2	T8-28	48	LED2X10.5TUBE4FT-DEP	2	2	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	4	T8 Elec Ballasts	2	0.1	222.5	0.0	100.1	0.1	122.4
205	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	2318	94 SMALL LIBRARY	OSW-1G		2424T8-28	3	T8-28	48	LED2X10.5TUBE4FT-DEP	3	3	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	6	T8 Elec Ballasts	3	0.1	333.8	0.1	150.2	0.1	183.6
206	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	800	STORAGE IN 94			CF18	3	CFL	20	LED9A19	3	3	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	3	0	0	0.1	48.0	0.0	21.6	0.0	26.4
207	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	3614	GYM	FMS-277	HB	1444T5HO	18	T5HO-54	234	LED4X25TUBE T54FT-SOCKETS	18	18	LED	LED-RL-SCKTS	100	0	57%	134	1x4 fixture with (4) 4' Lamps T5 High Output	T5 Lamps 4' HO	72	T5 Elec Ballasts	0	4.2	15222.2	1.8	6505.2	2.4	8717.0

Floral Park-Bellerose UFSD
Exhibit G-5-1
ECM 1 - LED Lighting and Lighting Controls Upgrade

Line #	SITE/ BUILDING	INT/ EXT	Floor/EXT	Annual Hours	Location Description	Switch	TYPE/ MOUNT	EXISTING CODE	Existing QTY	EXISTING TECH	Existing Watts	PROPOSED CODE	Proposal QTY	REMAIN	PROPOSED TECH	RETRO CODE	Proposed Watts	SENSORS REMAIN	Wattage Reduction percentage	UNIT WATT SAVINGS	EXISTING DESCRIPTION	EXISTING LAMP	E lamp total qty	EXISTING Ballast	E ballast total qty	Total kW Existing	Total kWh Existing	Total kW Proposed	Total kWh Proposed	Total kW Saved	Total kWh Saved
208	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	8760	GYM			KLED-BB	4	LED-EXIT	2	NR	4	4	NO CHANGE	NO CHANGE	2	0	0%	0	Exit Sign, Battery Backup, Universal, MultiTap	LED Lamp	0	0	0	0.0	70.1	0.0	70.1	0.0	0.0
209	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	1600	UTILITY IN GYM			CF32	1	CFL	34	LED12A19	1	1	LED	LED-SI	12	0	65%	22	32 Watt CFL	Compact Fluorescent Lamp	1	0	0	0.0	54.4	0.0	19.2	0.0	35.2
210	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	1600	GYM STORAGE			CF32	1	CFL	34	LED12A19	1	1	LED	LED-SI	12	0	65%	22	32 Watt CFL	Compact Fluorescent Lamp	1	0	0	0.0	54.4	0.0	19.2	0.0	35.2
211	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	4228	HALLWAY MAIN			CF13	21	CFL	15	LED9A19	21	21	LED	LED-SI	9	0	40%	6	13 Watt CFL	Compact Fluorescent Lamp	21	0	0	0.3	1331.8	0.2	799.1	0.1	532.7
212	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	8760	CENTER SOFFIT			1414T8-28	4	T8-28	24	LED1X10.5TUBE4FT-DEP	4	4	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	4	T8 Elec Ballasts	4	0.1	841.0	0.0	378.4	0.1	462.5
213	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	8760	CENTER SOFFIT			1212T8	8	T8-17	18	LED1X9TUBE2FT-DEP	8	8	LED	LED-RL	10	0	47%	8	1x2 fixture with (1) 2' Lamp T8	T8 Lamps 2'	8	T8 Elec Ballasts	8	0.1	1261.4	0.1	672.8	0.1	588.7
214	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	4228	HALLWAY MAIN / ELEVATOR LOBBY			2222T8	2	T8-17	37	LED2X9TUBE2FT-DEP	2	2	LED	LED-RL	19	0	48%	18	2x2 fixture with (2) 2' Lamps T8	T8 Lamps 2'	4	T8 Elec Ballasts	2	0.1	312.9	0.0	162.4	0.0	150.5
215	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	4228	HALLWAY MAIN			2424T8-28	15	T8-28	48	LED2X10.5TUBE4FT-DEP	15	15	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	30	T8 Elec Ballasts	15	0.7	3044.2	0.3	1369.9	0.4	1674.3
216	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	8760	HALLWAY MAIN			KLED-BB	9	LED-EXIT	2	NR	9	9	NO CHANGE	NO CHANGE	2	0	0%	0	Exit Sign, Battery Backup, Universal, MultiTap	LED Lamp	0	0	0	0.0	157.7	0.0	157.7	0.0	0.0
217	FLORAL PARK / BELLROSE ELEMENTARY	INT	1	8760	HALLWAY MAIN			KLED-BB-FE	2	LED-EXIT	2	NR	2	2	NO CHANGE	NO CHANGE	2	0	0%	0	Install a new LED Exit Sign, Battery Backup, Frog Eyes	LED Lamp	0	0	0	0.0	35.0	0.0	35.0	0.0	0.0
218	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	3614	KITCHEN		WRAP	1414T8-28	7	T8-28	24	LED1X10.5TUBE4FT-DEP	7	7	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	7	T8 Elec Ballasts	7	0.2	607.2	0.1	273.2	0.1	333.9
219	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	800	KITCHEN REAR UTILITY			CF18	7	CFL	20	LED9A19	7	7	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	7	0	0	0.1	112.0	0.1	50.4	0.1	61.6
220	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	1912	KITCHEN OFFICE		8' WRAP	1824T8-28	1	T8-28	48	LED2X10.5TUBE4FT-DEP	1	1	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	1	0.0	91.8	0.0	41.3	0.0	50.5
221	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	3614	DISHWASHING		8' WRAP	1824T8-28	1	T8-28	48	LED2X10.5TUBE4FT-DEP	1	1	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	1	0.0	173.5	0.0	78.1	0.0	95.4
222	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	3614	DISHWASHING		WRAP	1414T8-28	1	T8-28	24	LED1X10.5TUBE4FT-DEP	1	1	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	1	T8 Elec Ballasts	1	0.0	86.7	0.0	39.0	0.0	47.7
223	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	3614	CAFETERIA			2424T8-28	26	T8-28	48	LED2X10.5TUBE4FT-DEP	26	26	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	52	T8 Elec Ballasts	26	1.2	4510.3	0.6	2029.6	0.7	2480.6
224	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	3614	CAFETERIA			1414T8-28	10	T8-28	24	LED1X10.5TUBE4FT-DEP	10	10	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	10	T8 Elec Ballasts	10	0.2	867.4	0.1	390.3	0.1	477.0
225	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	8760	CAFETERIA			KLED-BB	5	LED-EXIT	2	NR	5	5	NO CHANGE	NO CHANGE	2	0	0%	0	Exit Sign, Battery Backup, Universal, MultiTap	LED Lamp	0	0	0	0.0	87.6	0.0	87.6	0.0	0.0
226	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	1800	CLASSROOM 11		2X2 FLAT PANEL	LED	15	LED	0	NR	15	15	NO CHANGE	NO CHANGE	0	1	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
227	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	2499	BATH IN CLASS 11	OSW-1G	2X2 FLAT PANEL	LED	1	LED	0	NR	1	1	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
228	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	1600	CLASS 10	OSC-1D	2X2 FLAT PANEL	LED	10	LED	0	NR	10	10	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
229	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	800	CLASS 10 UTILITY			CF18	3	CFL	20	LED9A19	3	3	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	3	0	0	0.1	48.0	0.0	21.6	0.0	26.4
230	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	2499	BATH GIRLS		2X4 FLAT PANEL	LED	3	LED	0	NR	3	3	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0

Floral Park-Bellerose UFSD
Exhibit G-5-1
ECM 1 - LED Lighting and Lighting Controls Upgrade

Line #	SITE/ BUILDING	INT/ EXT	Floor/E XT	Annual Hours	Location Description	Switch	TYPE/ MOUNT	EXISTING CODE	Existing QTY	EXISTING TECH	Existing Watts	PROPOSED CODE	Proposal QTY	REMAIN	PROPOSED TECH	RETRO CODE	Proposed Watts	SENSORS REMAIN	Wattage Reduction percentage	UNIT WATT SAVINGS	EXISTING DESCRIPTION	EXISTING LAMP	E lamp total qty	EXISTING Ballast	E ballast total qty	Total kW Existing	Total kWh Existing	Total kW Proposed	Total kWh Proposed	Total kW Saved	Total kWh Saved
231	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	2499	BATH GIRLS		2X2 FLAT PANEL	LED	1	LED	0	NR	1	1	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
232	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	2499	BATH BOYS		2X4 FLAT PANEL	LED	3	LED	0	NR	3	3	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
233	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	2499	BATH BOYS		2X2 FLAT PANEL	LED	1	LED	0	NR	1	1	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
234	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	800	UTILITY IN GIRLS			CF18	1	CFL	20	LED9A19	1	1	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	1	0	0	0.0	16.0	0.0	7.2	0.0	8.8
235	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	800	UTILITY			CF18	1	CFL	20	LED9A19	1	1	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	1	0	0	0.0	16.0	0.0	7.2	0.0	8.8
236	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	2318	RM 9 / COPY ROOM		8' WRAP	1824T8-28	2	T8-28	48	LED2X10.5TUBE4FT-DEP	2	2	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	4	T8 Elec Ballasts	2	0.1	222.5	0.0	100.1	0.1	122.4
237	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	2318	RM 9 / COPY ROOM			2424T8-28	2	T8-28	48	LED2X10.5TUBE4FT-DEP	2	2	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	4	T8 Elec Ballasts	2	0.1	222.5	0.0	100.1	0.1	122.4
238	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	800	PANEL ROOM			CF18	1	CFL	20	LED9A19	1	1	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	1	0	0	0.0	16.0	0.0	7.2	0.0	8.8
239	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	2318	OFFICE 8	OSC-2D		2424T8-28	5	T8-28	48	LED2X10.5TUBE4FT-DEP	5	5	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	10	T8 Elec Ballasts	5	0.2	556.3	0.1	250.3	0.1	306.0
240	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	800	UTILITY IN OFFICE 8		WRAP	1424T8-28	1	T8-28	48	LED2X10.5TUBE4FT-DEP	1	1	LED	LED-RL	22	0	55%	26	1x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	1	0.0	38.4	0.0	17.3	0.0	21.1
241	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	800	UTILITY IN OFFICE 8			2424T8-28	1	T8-28	48	LED2X10.5TUBE4FT-DEP	1	1	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	1	0.0	38.4	0.0	17.3	0.0	21.1
242	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	1600	CLASS 7	OSW-1G		2444T8-28	1	T8-28	94	LED4X10.5TUBE4FT-DEP	1	1	LED	LED-RL	43	0	54%	51	2x4 fixture with (4) 4' Lamps T8 28W	T8 Lamps 4'	4	T8 Elec Ballasts	1	0.1	150.4	0.0	69.1	0.1	81.3
243	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	800	ELECTRIC ROOM IN CLASS 7			2444T8-28	1	T8-28	94	LED4X10.5TUBE4FT-DEP	1	1	LED	LED-RL	43	0	54%	51	2x4 fixture with (4) 4' Lamps T8 28W	T8 Lamps 4'	4	T8 Elec Ballasts	1	0.1	75.2	0.0	34.6	0.1	40.6
244	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	800	UTILITY REAR 7			2424T8-28	1	T8-28	48	LED2X10.5TUBE4FT-DEP	1	1	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	1	0.0	38.4	0.0	17.3	0.0	21.1
245	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	800	STORAGE			CF18	15	CFL	20	LED9A19	15	15	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	15	0	0	0.3	240.0	0.1	108.0	0.2	132.0
246	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	800	STORAGE		WRAP	1414T8-28	1	T8-28	24	LED1X10.5TUBE4FT-DEP	1	1	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	1	T8 Elec Ballasts	1	0.0	19.2	0.0	8.6	0.0	10.6
247	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	1800	CLASS 6			2424T8-28	4	T8-28	48	LED2X10.5TUBE4FT-DEP	4	4	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	8	T8 Elec Ballasts	4	0.2	345.6	0.1	155.5	0.1	190.1
248	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	1800	CLASS 6A			2424T8-28	4	T8-28	48	LED2X10.5TUBE4FT-DEP	4	4	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	8	T8 Elec Ballasts	4	0.2	345.6	0.1	155.5	0.1	190.1
249	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	800	UTILITY / CUSTODIAL			CF18	1	CFL	20	LED9A19	1	1	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	1	0	0	0.0	16.0	0.0	7.2	0.0	8.8
250	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	2499	BATH GIRLS			2424T8-28	3	T8-28	48	LED2X10.5TUBE4FT-DEP	3	3	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	6	T8 Elec Ballasts	3	0.1	359.9	0.1	161.9	0.1	197.9
251	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	2499	BATH GIRLS			CF18	1	CFL	20	LED9A19	1	1	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	1	0	0	0.0	50.0	0.0	22.5	0.0	27.5
252	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	800	BATH GIRLS			2222T8	1	T8-17	37	LED2X9TUBE2FT-DEP	1	1	LED	LED-RL	19	0	48%	18	2x2 fixture with (2) 2' Lamps T8	T8 Lamps 2'	2	T8 Elec Ballasts	1	0.0	29.6	0.0	15.4	0.0	14.2
253	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	2499	BATH BOYS			2424T8-28	4	T8-28	48	LED2X10.5TUBE4FT-DEP	4	4	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	8	T8 Elec Ballasts	4	0.2	479.8	0.1	215.9	0.1	263.9

Floral Park-Bellerose UFSD
Exhibit G-5-1
ECM 1 - LED Lighting and Lighting Controls Upgrade

Line #	SITE/ BUILDING	INT/ EXT	Floor/E XT	Annual Hours	Location Description	Switch	TYPE/ MOUNT	EXISTING CODE	Existing QTY	EXISTING TECH	Existing Watts	PROPOSED CODE	Proposal QTY	REMAI N	PROPOSED TECH	RETRO CODE	Proposed Watts	SENSORS REMAIN	Wattage Reduction percentage	UNIT WATT SAVINGS	EXISTING DESCRIPTION	EXISTING LAMP	E lamp total qty	EXISTING Ballast	E ballast total qty	Total kW Existing	Total kWh Existing	Total kW Proposed	Total kWh Proposed	Total kW Saved	Total kWh Saved
254	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	2499	BATH BOYS			CF18	2	CFL	20	LED9A19	2	2	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	2	0	0	0.0	100.0	0.0	45.0	0.0	55.0
255	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	1600	FACULTY ROOM	OSW-1G	WRAP	1414T8-28	4	T8-28	24	LED1X10.5TUB E4FT-DEP	4	4	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	4	T8 Elec Ballasts	4	0.1	153.6	0.0	69.1	0.1	84.5
256	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	1800	CLASS 5			2424T8-28	8	T8-28	48	LED2X10.5TUB E4FT-DEP	8	8	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	16	T8 Elec Ballasts	8	0.4	691.2	0.2	311.0	0.2	380.2
257	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	1600	CLASS 4	FMS-277		2424T8-28	8	T8-28	48	LED2X10.5TUB E4FT-DEP	8	8	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	16	T8 Elec Ballasts	8	0.4	614.4	0.2	276.5	0.2	337.9
258	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	1800	CLASS 3		8' WRAP	1824T8-28	9	T8-28	48	LED2X10.5TUB E4FT-DEP	9	9	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	18	T8 Elec Ballasts	9	0.4	777.6	0.2	349.9	0.2	427.7
259	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	1800	CLASS 3		WRAP	1414T8-28	3	T8-28	24	LED1X10.5TUB E4FT-DEP	3	3	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	3	T8 Elec Ballasts	3	0.1	129.6	0.0	58.3	0.0	71.3
260	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	800	CLASS 3 / STORAGE		WRAP	1414T8-28	2	T8-28	24	LED1X10.5TUB E4FT-DEP	2	2	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	2	0.0	38.4	0.0	17.3	0.0	21.1
261	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	1600	CLASS 1	OSC-1D		2424T8-28	9	T8-28	48	LED2X10.5TUB E4FT-DEP	9	9	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	18	T8 Elec Ballasts	9	0.4	691.2	0.2	311.0	0.2	380.2
262	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	1600	CLASS 1A	OSC-1D		2424T8-28	6	T8-28	48	LED2X10.5TUB E4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4
263	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	1600	STORAGE	OSW-1G		2424T8-28	2	T8-28	48	LED2X10.5TUB E4FT-DEP	2	2	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	4	T8 Elec Ballasts	2	0.1	153.6	0.0	69.1	0.1	84.5
264	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	3614	OFFICE CUSTODIAL		WRAP	1414T8-28	2	T8-28	24	LED1X10.5TUB E4FT-DEP	2	2	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	2	0.0	173.5	0.0	78.1	0.0	95.4
265	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	3614	SHOP			2424T8-28	3	T8-28	48	LED2X10.5TUB E4FT-DEP	3	3	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	6	T8 Elec Ballasts	3	0.1	520.4	0.1	234.2	0.1	286.2
266	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	3614	SHOP		WRAP	1414T8-28	2	T8-28	24	LED1X10.5TUB E4FT-DEP	2	2	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	2	0.0	173.5	0.0	78.1	0.0	95.4
267	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	3614	ELEVATOR ROOM			2424T8-28	2	T8-28	48	LED2X10.5TUB E4FT-DEP	2	2	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	4	T8 Elec Ballasts	2	0.1	346.9	0.0	156.1	0.1	190.8
268	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	3614	PAINT STORAGE		WRAP	1414T8-28	2	T8-28	24	LED1X10.5TUB E4FT-DEP	2	2	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	2	0.0	173.5	0.0	78.1	0.0	95.4
269	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	4228	HALLWAY AT PAINT ROOM			2222T8	2	T8-17	37	LED2X9TUBE2 FT-DEP	2	2	LED	LED-RL	19	0	48%	18	2x2 fixture with (2) 2' Lamps T8	T8 Lamps 2'	4	T8 Elec Ballasts	2	0.1	312.9	0.0	162.4	0.0	150.5
270	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	1600	IT ROOM 16	OSW-1G		2434T8-28	3	T8-28	72	LED3X10.5TUB E4FT-DEP	3	3	LED	LED-RL	32	0	55%	40	2x4 fixture with (3) 4' Lamps T8 28W	T8 Lamps 4'	9	T8 Elec Ballasts	3	0.2	345.6	0.1	155.5	0.1	190.1
271	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	4228	HALLWAY AT ROOM 13			2222T8	4	T8-17	37	LED2X9TUBE2 FT-DEP	4	4	LED	LED-RL	19	0	48%	18	2x2 fixture with (2) 2' Lamps T8	T8 Lamps 2'	8	T8 Elec Ballasts	4	0.1	625.7	0.1	324.7	0.1	301.0
272	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	4228	HALLWAY AT ROOM 13			2222T8	1	T8-17	37	LED2X9TUBE2 FT-DEP	1	1	LED	LED-RL	19	0	48%	18	2x2 fixture with (2) 2' Lamps T8	T8 Lamps 2'	2	T8 Elec Ballasts	1	0.0	156.4	0.0	81.2	0.0	75.3
273	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	8760	HALLWAY AT ROOM 13			KLED-BB-FE	1	LED-EXIT	2	NR	1	1	NO CHANGE	NO CHANGE	2	0	0%	0	Install a new LED Exit Sign, Battery Backup, Frog Eyes	LED Lamp	0	0	0	0.0	17.5	0.0	17.5	0.0	0.0
274	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	1600	CLASS 13	OSC-1D		2424T8-28	10	T8-28	48	LED2X10.5TUB E4FT-DEP	10	10	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	20	T8 Elec Ballasts	10	0.5	768.0	0.2	345.6	0.3	422.4
275	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	800	UTILITY CLASS 13			2424T8-28	1	T8-28	48	LED2X10.5TUB E4FT-DEP	1	1	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	1	0.0	38.4	0.0	17.3	0.0	21.1
276	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	2499	BATH IN CLASS 13	OSW-1G	2' VANITY	1212T8	1	T8-17	18	LED1X9TUBE2 FT-DEP	1	1	LED	LED-RL	10	0	47%	8	1x2 fixture with (1) 2' Lamp T8	T8 Lamps 2'	1	T8 Elec Ballasts	1	0.0	45.0	0.0	24.0	0.0	21.0

Floral Park-Bellerose UFSD
Exhibit G-5-1
ECM 1 - LED Lighting and Lighting Controls Upgrade

Line #	SITE/ BUILDING	INT/ EXT	Floor/EXT	Annual Hours	Location Description	Switch	TYPE/ MOUNT	EXISTING CODE	Existing QTY	EXISTING TECH	Existing Watts	PROPOSED CODE	Proposal QTY	REMAIN	PROPOSED TECH	RETRO CODE	Proposed Watts	SENSORS REMAIN	Wattage Reduction percentage	UNIT WATT SAVINGS	EXISTING DESCRIPTION	EXISTING LAMP	E lamp total qty	EXISTING Ballast	E ballast total qty	Total kW Existing	Total kWh Existing	Total kW Proposed	Total kWh Proposed	Total kW Saved	Total kWh Saved
277	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	1600	CLASS 15	OSC-1D		2424T8-28	9	T8-28	48	LED2X10.5TUBE4FT-DEP	9	9	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	18	T8 Elec Ballasts	9	0.4	691.2	0.2	311.0	0.2	380.2
278	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	2499	BATH IN CLASS 15	OSW-1G	VANITY	1414T8-28	1	T8-28	24	LED1X10.5TUBE4FT-DEP	1	1	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	1	T8 Elec Ballasts	1	0.0	60.0	0.0	27.0	0.0	33.0
279	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	800	UTILITY IN HALL			CF18	1	CFL	20	LED9A19	1	1	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	1	0	0	0.0	16.0	0.0	7.2	0.0	8.8
280	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	1600	CLASS 14	OSC-1D		2424T8-28	9	T8-28	48	LED2X10.5TUBE4FT-DEP	9	9	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	18	T8 Elec Ballasts	9	0.4	691.2	0.2	311.0	0.2	380.2
281	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	2499	CLASS 14 BATH			2424T8-28	1	T8-28	48	LED2X10.5TUBE4FT-DEP	1	1	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	1	0.0	120.0	0.0	54.0	0.0	66.0
282	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	800	UTILITIES AT END OF HALL			CF18	1	CFL	20	LED9A19	1	1	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	1	0	0	0.0	16.0	0.0	7.2	0.0	8.8
283	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	4228	HALL MAIN			2222T8	11	T8-17	37	LED2X9TUBE2FT-DEP	11	11	LED	LED-RL	19	0	48%	18	2x2 fixture with (2) 2' Lamps T8	T8 Lamps 2'	22	T8 Elec Ballasts	11	0.4	1720.8	0.2	893.0	0.2	827.8
284	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	8760	HALLWAY MAIN			KLED-BB	9	LED-EXIT	2	NR	9	9	NO CHANGE	NO CHANGE	2	0	0%	0	Exit Sign, Battery Backup, Universal, MultiTap	LED Lamp	0	0	0	0.0	157.7	0.0	157.7	0.0	0.0
285	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	4228	HALLWAY MAIN		WRAP	1414T8-28	12	T8-28	24	LED1X10.5TUBE4FT-DEP	12	12	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	12	0.3	1217.7	0.1	547.9	0.2	669.7
286	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	800	BATH IN STAIRS TO BOILER	OSW-1G		CF18	1	CFL	20	LED9A19	1	1	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	1	0	0	0.0	16.0	0.0	7.2	0.0	8.8
287	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	4228	STAIRS			CF18	2	CFL	20	LED9A19	2	2	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	2	0	0	0.0	169.1	0.0	76.1	0.0	93.0
288	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	4228	STORAGE			2424T8-28	1	T8-28	48	LED2X10.5TUBE4FT-DEP	1	1	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	1	0.0	202.9	0.0	91.3	0.0	111.6
289	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	800	FAN ROOM			CF32	3	CFL	34	LED12A19	3	3	LED	LED-SI	12	0	65%	22	32 Watt CFL	Compact Fluorescent Lamp	3	0	0	0.1	81.6	0.0	28.8	0.1	52.8
290	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	800	BOILER ROOM			2424T8-28	3	T8-28	48	LED2X10.5TUBE4FT-DEP	3	3	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	6	T8 Elec Ballasts	3	0.1	115.2	0.1	51.8	0.1	63.4
291	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	800	BOILER ROOM			CF32	4	CFL	34	LED12A19	4	4	LED	LED-SI	12	0	65%	22	32 Watt CFL	Compact Fluorescent Lamp	4	0	0	0.1	108.8	0.0	38.4	0.1	70.4
292	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	800	BOILER ROOM		8' WRAP	1824T8-28	1	T8-28	48	LED2X10.5TUBE4FT-DEP	1	1	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	1	0.0	38.4	0.0	17.3	0.0	21.1
293	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	800	FAN ROOM			CF32	3	CFL	34	LED12A19	3	3	LED	LED-SI	12	0	65%	22	32 Watt CFL	Compact Fluorescent Lamp	3	0	0	0.1	81.6	0.0	28.8	0.1	52.8
294	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	800	LARGE STORAGE			CF32	2	CFL	34	LED12A19	2	2	LED	LED-SI	12	0	65%	22	32 Watt CFL	Compact Fluorescent Lamp	2	0	0	0.1	54.4	0.0	19.2	0.0	35.2
295	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	800	TUNNELL			CF18	23	CFL	20	LED9A19	23	23	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	23	0	0	0.5	368.0	0.2	165.6	0.3	202.4
296	FLORAL PARK / BELLROSE ELEMENTARY	INT	B	1600	BUILDING & GROUNDS GARAGE		8' WRAP	1824T8-28	2	T8-28	48	LED2X10.5TUBE4FT-DEP	2	2	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	4	T8 Elec Ballasts	2	0.1	153.6	0.0	69.1	0.1	84.5
297	FLORAL PARK / BELLROSE ELEMENTARY	EXT	EXT	4380	COURTYARD		ROUND WP	S70	6	HPS	90	LED18CORNCOB	6	6	LED	LED-KIT	18	0	80%	72	70 Watt High Pressure Sodium	Pressure Sodium Lamp	6	Pressure Sodium Ballasts	6	0.5	2365.2	0.1	473.0	0.4	1892.2
298	FLORAL PARK / BELLROSE ELEMENTARY	EXT	EXT	4380	COURTYARD		FLOOD	S250	1	HPS	295	LED45CORNCOB	1	1	LED	LED-KIT	45	0	85%	250	250 Watt High Pressure Sodium	Pressure Sodium Lamp	1	Pressure Sodium Ballasts	1	0.3	1292.1	0.0	197.1	0.3	1095.0
299	FLORAL PARK / BELLROSE ELEMENTARY	EXT	EXT	4380	EXTERIOR		FCO?	LED	31	LED	0	NR	31	31	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0

Floral Park-Bellerose UFSD
Exhibit G-5-1
ECM 1 - LED Lighting and Lighting Controls Upgrade

Line #	SITE/ BUILDING	INT/ EXT	Floor/EXT	Annual Hours	Location Description	Switch	TYPE/ MOUNT	EXISTING CODE	Existing QTY	EXISTING TECH	Existing Watts	PROPOSED CODE	Proposal QTY	REMAIN	PROPOSED TECH	RETRO CODE	Proposed Watts	SENSORS REMAIN	Wattage Reduction percentage	UNIT WATT SAVINGS	EXISTING DESCRIPTION	EXISTING LAMP	E lamp total qty	EXISTING Ballast	E ballast total qty	Total kW Existing	Total kWh Existing	Total kW Proposed	Total kWh Proposed	Total kW Saved	Total kWh Saved
300	FLORAL PARK / BELLROSE ELEMENTARY	EXT	EXT	4380	EXT SIDE ENT (3)		COACH	LED	6	LED	0	NR	6	6	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
301	FLORAL PARK / BELLROSE ELEMENTARY	EXT	EXT	4380	FRONT ENT		HANGING COACH	LED	3	LED	0	NR	3	3	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
302	FLORAL PARK / BELLROSE ELEMENTARY	EXT	EXT	4380	BASEMENT ENTRIES		DRUM	LED	4	LED	0	NR	4	4	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
303	FLORAL PARK / BELLROSE ELEMENTARY	EXT	EXT	4380	BACK		FLOOD / NIPPLE	S70	2	HPS	90	LED24CORNCOB	2	2	LED	LED-KIT	24	0	73%	66	70 Watt High Pressure Sodium	Pressure Sodium Lamp	2	Pressure Sodium Ballasts	2	0.2	788.4	0.0	210.2	0.1	578.2
304	JOHN LEWIS CHILDS ELEMENTARY	INT	2	4228	STAIRWELL @215			2424T8-28	1	T8-28	48	LED2X10.5TUBE4FT-DEP	1	1	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	1	0.0	202.9	0.0	91.3	0.0	111.6
305	JOHN LEWIS CHILDS ELEMENTARY	INT	2	2499	BATH BOYS	OSC-1D	2X4	LED	2	LED	0	NR	2	2	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
306	JOHN LEWIS CHILDS ELEMENTARY	INT	2	2499	BATH BOYS		2X2 BBU	LED	1	LED	0	NR	1	1	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
307	JOHN LEWIS CHILDS ELEMENTARY	INT	2	800	UTILITY		SB	2222T8	1	T8-17	37	LED2X9TUBE2FT-DEP	1	1	LED	LED-RL	19	0	48%	18	2x2 fixture with (2) 2' Lamps T8	T8 Lamps 2'	2	T8 Elec Ballasts	1	0.0	29.6	0.0	15.4	0.0	14.2
308	JOHN LEWIS CHILDS ELEMENTARY	INT	2	1600	CLASS 217	OSC-1D-3P	8' WRAP	1824T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4
309	JOHN LEWIS CHILDS ELEMENTARY	INT	2	1600	CLASS 216	OSC-1D-3P	8' WRAP	1824T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4
310	JOHN LEWIS CHILDS ELEMENTARY	INT	2	1800	CLASS 214		8' WRAP	1824T8-28	1	T8-28	48	LED2X10.5TUBE4FT-DEP	1	1	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	1	0.0	86.4	0.0	38.9	0.0	47.5
311	JOHN LEWIS CHILDS ELEMENTARY	INT	2	1800	CLASS 214		WRAP	1414T8-28	1	T8-28	24	LED1X10.5TUBE4FT-DEP	1	1	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	1	T8 Elec Ballasts	1	0.0	43.2	0.0	19.4	0.0	23.8
312	JOHN LEWIS CHILDS ELEMENTARY	INT	2	4228	STAIRWELL @215			2424T8-28	3	T8-28	48	LED2X10.5TUBE4FT-DEP	3	3	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	6	T8 Elec Ballasts	3	0.1	608.8	0.1	274.0	0.1	334.9
313	JOHN LEWIS CHILDS ELEMENTARY	INT	2	8760	STAIRWELL @215			KLED-BB-FE	2	LED-EXIT	2	NR	2	2	NO CHANGE	NO CHANGE	2	0	0%	0	Install a new LED Exit Sign, Battery Backup, Frog Eyes	LED Lamp	0	0	0	0.0	35.0	0.0	35.0	0.0	0.0
314	JOHN LEWIS CHILDS ELEMENTARY	INT	2	1600	CLASS 218	SENSOR EXSITING		2424T8-28	10	T8-28	48	LED2X10.5TUBE4FT-DEP	10	10	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	20	T8 Elec Ballasts	10	0.5	768.0	0.2	345.6	0.3	422.4
315	JOHN LEWIS CHILDS ELEMENTARY	INT	2	1600	218 STORAGE 1	OSW-1G		2424T8-28	1	T8-28	48	LED2X10.5TUBE4FT-DEP	1	1	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	1	0.0	76.8	0.0	34.6	0.0	42.2
316	JOHN LEWIS CHILDS ELEMENTARY	INT	2	1600	218 STORAGE 2	SENSOR EXSITING		2424T8-28	1	T8-28	48	LED2X10.5TUBE4FT-DEP	1	1	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	1	0.0	76.8	0.0	34.6	0.0	42.2
317	JOHN LEWIS CHILDS ELEMENTARY	INT	2	1600	CLASS 215	SENSOR EXSITING		2424T8-28	9	T8-28	48	LED2X10.5TUBE4FT-DEP	9	9	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	18	T8 Elec Ballasts	9	0.4	691.2	0.2	311.0	0.2	380.2
318	JOHN LEWIS CHILDS ELEMENTARY	INT	2	2499	BATH GIRLS	OSW-1G	2X4	LED	2	LED	0	NR	2	2	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
319	JOHN LEWIS CHILDS ELEMENTARY	INT	2	2499	BATH GIRLS		2X2 BBU	LED	1	LED	0	NR	1	1	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
320	JOHN LEWIS CHILDS ELEMENTARY	INT	2	1600	CLASS 213	OSC-1D-3P	8' WRAP	1824T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4
321	JOHN LEWIS CHILDS ELEMENTARY	INT	2	1600	CLASS 212	OSC-1D-3P	8' WRAP	1824T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4
322	JOHN LEWIS CHILDS ELEMENTARY	INT	2	1600	CLASS 211	OSC-1D-3P	8' WRAP	1824T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4

Floral Park-Bellerose UFSD
Exhibit G-5-1
ECM 1 - LED Lighting and Lighting Controls Upgrade

Line #	SITE/ BUILDING	INT/ EXT	Floor/EXT	Annual Hours	Location Description	Switch	TYPE/ MOUNT	EXISTING CODE	Existing QTY	EXISTING TECH	Existing Watts	PROPOSED CODE	Proposal QTY	REMAIN	PROPOSED TECH	RETRO CODE	Proposed Watts	SENSORS REMAIN	Wattage Reduction percentage	UNIT WATT SAVINGS	EXISTING DESCRIPTION	EXISTING LAMP	E lamp total qty	EXISTING Ballast	E ballast total qty	Total kW Existing	Total kWh Existing	Total kW Proposed	Total kWh Proposed	Total kW Saved	Total kWh Saved
323	JOHN LEWIS CHILDS ELEMENTARY	INT	2	1600	CLASS 210	OSC-1D-3P	8' WRAP	1824T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4
324	JOHN LEWIS CHILDS ELEMENTARY	INT	2	1600	CLASS 209	OSC-1D-3P	8' WRAP	1824T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4
325	JOHN LEWIS CHILDS ELEMENTARY	INT	2	1600	CLASS 208	OSC-1D-3P	8' WRAP	1824T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4
326	JOHN LEWIS CHILDS ELEMENTARY	INT	2	1600	CLASS 207	OSC-1D-3P	8' WRAP	1824T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4
327	JOHN LEWIS CHILDS ELEMENTARY	INT	2	1600	CLASS 206	OSC-1D-3P	8' WRAP	1824T8-28	4	T8-28	48	LED2X10.5TUBE4FT-DEP	4	4	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	8	T8 Elec Ballasts	4	0.2	307.2	0.1	138.2	0.1	169.0
328	JOHN LEWIS CHILDS ELEMENTARY	INT	2	1800	CLASS 206		WRAP	1414T8-28	2	T8-28	24	LED1X10.5TUBE4FT-DEP	2	2	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	2	0.0	86.4	0.0	38.9	0.0	47.5
329	JOHN LEWIS CHILDS ELEMENTARY	INT	2	1600	CLASS 204	OSC-1D-3P	8' WRAP	1824T8-28	4	T8-28	48	LED2X10.5TUBE4FT-DEP	4	4	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	8	T8 Elec Ballasts	4	0.2	307.2	0.1	138.2	0.1	169.0
330	JOHN LEWIS CHILDS ELEMENTARY	INT	2	1600	CLASS 204	OSC-1D-3P	8' WRAP	1824T8-28	2	T8-28	48	LED2X10.5TUBE4FT-DEP	2	2	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	4	T8 Elec Ballasts	2	0.1	153.6	0.0	69.1	0.1	84.5
331	JOHN LEWIS CHILDS ELEMENTARY	INT	2	1600	CLASS 205	OSW-1G	8' WIDE WRAP	1844T8-28	2	T8-28	94	LED4X10.5TUBE4FT-DEP	2	2	LED	LED-RL	43	0	54%	51	1x8 fixture with (4) 4' Lamps T8 28W	T8 Lamps 4'	8	T8 Elec Ballasts	2	0.2	300.8	0.1	138.2	0.1	162.6
332	JOHN LEWIS CHILDS ELEMENTARY	INT	2	1600	CLASS 203	OSC-1D-3P	8' WRAP	1824T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4
333	JOHN LEWIS CHILDS ELEMENTARY	INT	2	4228	STAIRWELL		WRAP	1414T8-28	1	T8-28	24	LED1X10.5TUBE4FT-DEP	1	1	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	1	T8 Elec Ballasts	1	0.0	101.5	0.0	45.7	0.0	55.8
334	JOHN LEWIS CHILDS ELEMENTARY	INT	2	1600	CLASS 202	OSC-1D-3P	8' WRAP	1824T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4
335	JOHN LEWIS CHILDS ELEMENTARY	INT	2	1600	CLASS 201	OSW-1G		2424T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4
336	JOHN LEWIS CHILDS ELEMENTARY	INT	2	4228	HALLWAY AT ELEVATOR			2222T8	4	T8-17	37	LED2X9TUBE2FT-DEP	4	4	LED	LED-RL	19	0	48%	18	2x2 fixture with (2) 2' Lamps T8	T8 Lamps 2'	8	T8 Elec Ballasts	4	0.1	625.7	0.1	324.7	0.1	301.0
337	JOHN LEWIS CHILDS ELEMENTARY	INT	2	4228	LOWER HALLWAY	OSC-2D		2222T8	7	T8-17	37	LED2X9TUBE2FT-DEP	7	7	LED	LED-RL	19	0	48%	18	2x2 fixture with (2) 2' Lamps T8	T8 Lamps 2'	14	T8 Elec Ballasts	7	0.3	1095.1	0.1	568.2	0.1	526.8
338	JOHN LEWIS CHILDS ELEMENTARY	INT	2	1600	CLASS 220	OSW-1G		2424T8-28	8	T8-28	48	LED2X10.5TUBE4FT-DEP	8	8	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	16	T8 Elec Ballasts	8	0.4	614.4	0.2	276.5	0.2	337.9
339	JOHN LEWIS CHILDS ELEMENTARY	INT	2	1600	CLASS 221	OSW-1G		2424T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4
340	JOHN LEWIS CHILDS ELEMENTARY	INT	2	2318	OFFICE 222	OSW-1G		2424T8-28	1	T8-28	48	LED2X10.5TUBE4FT-DEP	1	1	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	1	0.0	111.3	0.0	50.1	0.0	61.2
341	JOHN LEWIS CHILDS ELEMENTARY	INT	2	800	UTILITY (3)			CF18	3	CFL	20	LED9A19	3	3	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	3	0	0	0.1	48.0	0.0	21.6	0.0	26.4
342	JOHN LEWIS CHILDS ELEMENTARY	INT	2	1600	CLASS 226	OSC-1D		2424T8-28	9	T8-28	48	LED2X10.5TUBE4FT-DEP	9	9	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	18	T8 Elec Ballasts	9	0.4	691.2	0.2	311.0	0.2	380.2
343	JOHN LEWIS CHILDS ELEMENTARY	INT	2	1600	CLASS 225			2424T8-28	9	T8-28	48	LED2X10.5TUBE4FT-DEP	9	9	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	18	T8 Elec Ballasts	9	0.4	691.2	0.2	311.0	0.2	380.2
344	JOHN LEWIS CHILDS ELEMENTARY	INT	2	800	UTILITY 225			1414T8-28	1	T8-28	24	LED1X10.5TUBE4FT-DEP	1	1	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	1	T8 Elec Ballasts	1	0.0	19.2	0.0	8.6	0.0	10.6
345	JOHN LEWIS CHILDS ELEMENTARY	INT	2	1600	CLASS 223	OSC-2D		2424T8-28	12	T8-28	48	LED2X10.5TUBE4FT-DEP	12	12	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	24	T8 Elec Ballasts	12	0.6	921.6	0.3	414.7	0.3	506.9

Floral Park-Bellerose UFSD
Exhibit G-5-1
ECM 1 - LED Lighting and Lighting Controls Upgrade

Line #	SITE/ BUILDING	INT/ EXT	Floor/EXT	Annual Hours	Location Description	Switch	TYPE/ MOUNT	EXISTING CODE	Existing QTY	EXISTING TECH	Existing Watts	PROPOSED CODE	Proposal QTY	REMAIN	PROPOSED TECH	RETRO CODE	Proposed Watts	SENSORS REMAIN	Wattage Reduction percentage	UNIT WATT SAVINGS	EXISTING DESCRIPTION	EXISTING LAMP	E lamp total qty	EXISTING Ballast	E ballast total qty	Total kW Existing	Total kWh Existing	Total kW Proposed	Total kWh Proposed	Total kW Saved	Total kWh Saved
346	JOHN LEWIS CHILDS ELEMENTARY	INT	2	1600	CLASS 224	OSC-2D		2424T8-28	14	T8-28	48	LED2X10.5TUBE4FT-DEP	14	14	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	28	T8 Elec Ballasts	14	0.7	1075.2	0.3	483.8	0.4	591.4
347	JOHN LEWIS CHILDS ELEMENTARY	INT	2	800	Class 224 Utilities (2)			CF18	2	CFL	20	LED9A19	2	2	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	2	0	0	0.0	32.0	0.0	14.4	0.0	17.6
348	JOHN LEWIS CHILDS ELEMENTARY	INT	2	2318	OFFICE 227	OSW-1G		2424T8-28	2	T8-28	48	LED2X10.5TUBE4FT-DEP	2	2	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	4	T8 Elec Ballasts	2	0.1	222.5	0.0	100.1	0.1	122.4
349	JOHN LEWIS CHILDS ELEMENTARY	INT	2	800	REAR 227 Utility			CF18	1	CFL	20	LED9A19	1	1	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	1	0	0	0.0	16.0	0.0	7.2	0.0	8.8
350	JOHN LEWIS CHILDS ELEMENTARY	INT	2	4228	STAIRWELL AT 227			2222T8	2	T8-17	37	LED2X9TUBE2FT-DEP	2	2	LED	LED-RL	19	0	48%	18	2x2 fixture with (2) 2' Lamps T8	T8 Lamps 2'	4	T8 Elec Ballasts	2	0.1	312.9	0.0	162.4	0.0	150.5
351	JOHN LEWIS CHILDS ELEMENTARY	INT	2	4228	HALLWAY AT STAIRWELL 227			2424T8-28	3	T8-28	48	LED2X10.5TUBE4FT-DEP	3	3	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	6	T8 Elec Ballasts	3	0.1	608.8	0.1	274.0	0.1	334.9
352	JOHN LEWIS CHILDS ELEMENTARY	INT	2	4228	HALLWAY AT 226			2424T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	1217.7	0.1	547.9	0.2	669.7
353	JOHN LEWIS CHILDS ELEMENTARY	INT	2	8760	HALLWAY AT 226			KLED-BB-FE	2	LED-EXIT	2	NR	2	2	NO CHANGE	NO CHANGE	2	0	0%	0	Install a new LED Exit Sign, Battery Backup, Frog Eyes	LED Lamp	0	0	0	0.0	35.0	0.0	35.0	0.0	0.0
354	JOHN LEWIS CHILDS ELEMENTARY	INT	2	4228	HALLWAY AT 226			I60PAR38	4	INC	60	LED14PAR38	4	4	LED	LED-SI	14	0	78%	47	60 Watt Inc, PAR38	Incandescent Lamp	4	In Lamp	0	0.2	1014.7	0.1	228.3	0.2	786.4
355	JOHN LEWIS CHILDS ELEMENTARY	INT	2	4228	HALLWAIN MAIN			2222T8	1	T8-17	37	LED2X9TUBE2FT-DEP	1	1	LED	LED-RL	19	0	48%	18	2x2 fixture with (2) 2' Lamps T8	T8 Lamps 2'	2	T8 Elec Ballasts	1	0.0	156.4	0.0	81.2	0.0	75.3
356	JOHN LEWIS CHILDS ELEMENTARY	INT	2	8760	HALLWAIN MAIN EXIT SIGNS			LED	3	LED	0	NR	3	3	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
357	JOHN LEWIS CHILDS ELEMENTARY	INT	2	4228	HALLWAIN MAIN			2424T8-28	8	T8-28	48	LED2X10.5TUBE4FT-DEP	8	8	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	16	T8 Elec Ballasts	8	0.4	1623.6	0.2	730.6	0.2	893.0
358	JOHN LEWIS CHILDS ELEMENTARY	INT	2	4228	HALLWAIN MAIN			2424T8-28	9	T8-28	48	LED2X10.5TUBE4FT-DEP	9	9	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	18	T8 Elec Ballasts	9	0.4	1826.5	0.2	821.9	0.2	1004.6
359	JOHN LEWIS CHILDS ELEMENTARY	INT	2	8760	HALLWAIN MAIN			KLED-BB-FE	2	LED-EXIT	2	NR	2	2	NO CHANGE	NO CHANGE	2	0	0%	0	Install a new LED Exit Sign, Battery Backup, Frog Eyes	LED Lamp	0	0	0	0.0	35.0	0.0	35.0	0.0	0.0
360	JOHN LEWIS CHILDS ELEMENTARY	INT	1	4228	STAIR/LOBBY		WRAP	1414T8-28	3	T8-28	24	LED1X10.5TUBE4FT-DEP	3	3	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	3	T8 Elec Ballasts	3	0.1	304.4	0.0	137.0	0.0	167.4
361	JOHN LEWIS CHILDS ELEMENTARY	INT	1	2499	BATH BOYS	OSC-1D	2X4 SB	LED	2	LED	0	NR	2	2	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
362	JOHN LEWIS CHILDS ELEMENTARY	INT	1	2499	BATH BOYS		2X2 BBU	LED	1	LED	0	NR	1	1	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
363	JOHN LEWIS CHILDS ELEMENTARY	INT	1	800	UTILITY			2222T8	1	T8-17	37	LED2X9TUBE2FT-DEP	1	1	LED	LED-RL	19	0	48%	18	2x2 fixture with (2) 2' Lamps T8	T8 Lamps 2'	2	T8 Elec Ballasts	1	0.0	29.6	0.0	15.4	0.0	14.2
364	JOHN LEWIS CHILDS ELEMENTARY	INT	1	1600	CLASS 115	OSC-1D-3P	8' WRAP	1824T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4
365	JOHN LEWIS CHILDS ELEMENTARY	INT	1	1600	CLASS 113	OSC-1D-3P	8' WRAP	1824T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4
366	JOHN LEWIS CHILDS ELEMENTARY	INT	1	2318	NURSE	OSC-1D		2222T8	2	T8-17	37	LED2X9TUBE2FT-DEP	2	2	LED	LED-RL	19	0	48%	18	2x2 fixture with (2) 2' Lamps T8	T8 Lamps 2'	4	T8 Elec Ballasts	2	0.1	171.5	0.0	89.0	0.0	82.5
367	JOHN LEWIS CHILDS ELEMENTARY	INT	1	2318	NURSE			2424T8-28	3	T8-28	48	LED2X10.5TUBE4FT-DEP	3	3	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	6	T8 Elec Ballasts	3	0.1	333.8	0.1	150.2	0.1	183.6
368	JOHN LEWIS CHILDS ELEMENTARY	INT	1	800	NURSE BATH			2222T8	1	T8-17	37	LED2X9TUBE2FT-DEP	1	1	LED	LED-RL	19	0	48%	18	2x2 fixture with (2) 2' Lamps T8	T8 Lamps 2'	2	T8 Elec Ballasts	1	0.0	29.6	0.0	15.4	0.0	14.2

Floral Park-Bellerose UFSD
Exhibit G-5-1
ECM 1 - LED Lighting and Lighting Controls Upgrade

Line #	SITE/ BUILDING	INT/ EXT	Floor/EXT	Annual Hours	Location Description	Switch	TYPE/ MOUNT	EXISTING CODE	Existing QTY	EXISTING TECH	Existing Watts	PROPOSED CODE	Proposal QTY	REMAIN	PROPOSED TECH	RETRO CODE	Proposed Watts	SENSORS REMAIN	Wattage Reduction percentage	UNIT WATT SAVINGS	EXISTING DESCRIPTION	EXISTING LAMP	E lamp total qty	EXISTING Ballast	E ballast total qty	Total kW Existing	Total kWh Existing	Total kW Proposed	Total kWh Proposed	Total kW Saved	Total kWh Saved
369	JOHN LEWIS CHILDS ELEMENTARY	INT	1	800	STORAGE NURSE			2222T8	1	T8-17	37	LED2X9TUBE2FT-DEP	1	1	LED	LED-RL	19	0	48%	18	2x2 fixture with (2) 2' Lamps T8	T8 Lamps 2'	2	T8 Elec Ballasts	1	0.0	29.6	0.0	15.4	0.0	14.2
370	JOHN LEWIS CHILDS ELEMENTARY	INT	1	1600	FACULTY ROOM	OSC-2D-2P	8' WRAP	1824T8-28	2	T8-28	48	LED2X10.5TUBE4FT-DEP	2	2	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	4	T8 Elec Ballasts	2	0.1	153.6	0.0	69.1	0.1	84.5
371	JOHN LEWIS CHILDS ELEMENTARY	INT	1	1800	FACULTY ROOM		WRAP	1414T8-28	1	T8-28	24	LED1X10.5TUBE4FT-DEP	1	1	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	1	T8 Elec Ballasts	1	0.0	43.2	0.0	19.4	0.0	23.8
372	JOHN LEWIS CHILDS ELEMENTARY	INT	1	2318	IT CLOSET		WRAP	1414T8-28	1	T8-28	24	LED1X10.5TUBE4FT-DEP	1	1	LED	LED-RL	11	1	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	1	T8 Elec Ballasts	1	0.0	55.6	0.0	25.0	0.0	30.6
373	JOHN LEWIS CHILDS ELEMENTARY	INT	1	2318	IT CLOSET		8' VANITY	1824T8-28	1	T8-28	48	LED2X10.5TUBE4FT-DEP	1	1	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	1	0.0	111.3	0.0	50.1	0.0	61.2
374	JOHN LEWIS CHILDS ELEMENTARY	INT	1	2318	CORNER STORAGE			2424T8-28	1	T8-28	48	LED2X10.5TUBE4FT-DEP	1	1	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	1	0.0	111.3	0.0	50.1	0.0	61.2
375	JOHN LEWIS CHILDS ELEMENTARY	INT	1	1600	CLASS 111	OSC-1D-3P	8' WRAP	1824T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4
376	JOHN LEWIS CHILDS ELEMENTARY	INT	1	2499	BATH GIRLS	OSC-1D	2X4 SB	LED	2	LED	0	NR	2	2	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
377	JOHN LEWIS CHILDS ELEMENTARY	INT	1	2499	BATH GIRLS		2X2 BBU	LED	1	LED	0	NR	1	1	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
378	JOHN LEWIS CHILDS ELEMENTARY	INT	1	4228	HALLWAY SMALL			2424T8-28	2	T8-28	48	LED2X10.5TUBE4FT-DEP	2	2	LED	LED-RL	22	1	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	4	T8 Elec Ballasts	2	0.1	405.9	0.0	182.6	0.1	223.2
379	JOHN LEWIS CHILDS ELEMENTARY	INT	1	2318	COPY ROOM			2424T8-28	2	T8-28	48	LED2X10.5TUBE4FT-DEP	2	2	LED	LED-RL	22	1	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	4	T8 Elec Ballasts	2	0.1	222.5	0.0	100.1	0.1	122.4
380	JOHN LEWIS CHILDS ELEMENTARY	INT	1	2499	BATH FACULTY			2424T8-28	1	T8-28	48	LED2X10.5TUBE4FT-DEP	1	1	LED	LED-RL	22	1	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	1	0.0	120.0	0.0	54.0	0.0	66.0
381	JOHN LEWIS CHILDS ELEMENTARY	INT	1	1600	CLASS 109	OSC-1D-3P	8' WRAP	1824T8-28	8	T8-28	48	LED2X10.5TUBE4FT-DEP	8	8	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	16	T8 Elec Ballasts	8	0.4	614.4	0.2	276.5	0.2	337.9
382	JOHN LEWIS CHILDS ELEMENTARY	INT	1	1800	CLASS 109		WRAP	1414T8-28	2	T8-28	24	LED1X10.5TUBE4FT-DEP	2	2	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	2	0.0	86.4	0.0	38.9	0.0	47.5
383	JOHN LEWIS CHILDS ELEMENTARY	INT	1	1600	CLASS 110	OSC-1D-3P	8' WRAP	1824T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4
384	JOHN LEWIS CHILDS ELEMENTARY	INT	1	1600	CLASS 108	OSC-1D-3P	8' WRAP	1824T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4
385	JOHN LEWIS CHILDS ELEMENTARY	INT	1	4228	HALLWAY SMALL		WRAP	1414T8-28	1	T8-28	24	LED1X10.5TUBE4FT-DEP	1	1	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	1	T8 Elec Ballasts	1	0.0	101.5	0.0	45.7	0.0	55.8
386	JOHN LEWIS CHILDS ELEMENTARY	INT	1	1600	CLASS 107	OSC-2D-3P	8' WRAP	1824T8-28	9	T8-28	48	LED2X10.5TUBE4FT-DEP	9	9	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	18	T8 Elec Ballasts	9	0.4	691.2	0.2	311.0	0.2	380.2
387	JOHN LEWIS CHILDS ELEMENTARY	INT	1	1800	CLASS 107		WRAP	1414T8-28	1	T8-28	24	LED1X10.5TUBE4FT-DEP	1	1	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	1	T8 Elec Ballasts	1	0.0	43.2	0.0	19.4	0.0	23.8
388	JOHN LEWIS CHILDS ELEMENTARY	INT	1	1800	CLASS 107 REST ROOM			2222T8	1	T8-17	37	LED2X9TUBE2FT-DEP	1	1	LED	LED-RL	19	0	48%	18	2x2 fixture with (2) 2' Lamps T8	T8 Lamps 2'	2	T8 Elec Ballasts	1	0.0	66.6	0.0	34.6	0.0	32.0
389	JOHN LEWIS CHILDS ELEMENTARY	INT	1	1600	CONFERENCE 106	OSC-1D-3P	2X2 FLAT PANEL	LED	6	LED	0	NR	6	6	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
390	JOHN LEWIS CHILDS ELEMENTARY	INT	1	4228	COVE		SALAD BOWL	LED	2	LED	0	NR	2	2	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
391	JOHN LEWIS CHILDS ELEMENTARY	INT	1	2318	STORAGE IN MAIN OFFICE			2424T8-28	2	T8-28	48	LED2X10.5TUBE4FT-DEP	2	2	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	4	T8 Elec Ballasts	2	0.1	222.5	0.0	100.1	0.1	122.4

Floral Park-Bellerose UFSD
Exhibit G-5-1
ECM 1 - LED Lighting and Lighting Controls Upgrade

Line #	SITE/ BUILDING	INT/ EXT	Floor/EXT	Annual Hours	Location Description	Switch	TYPE/ MOUNT	EXISTING CODE	Existing QTY	EXISTING TECH	Existing Watts	PROPOSED CODE	Proposal QTY	REMAIN	PROPOSED TECH	RETRO CODE	Proposed Watts	SENSORS REMAIN	Wattage Reduction percentage	UNIT WATT SAVINGS	EXISTING DESCRIPTION	EXISTING LAMP	E lamp total qty	EXISTING Ballast	E ballast total qty	Total kW Existing	Total kWh Existing	Total kW Proposed	Total kWh Proposed	Total kW Saved	Total kWh Saved
392	JOHN LEWIS CHILDS ELEMENTARY	INT	1	3640	OFFICE MAIN		2X2 FLAT PANEL	LED	12	LED	0	NR	12	12	NO CHANGE	NO CHANGE	0	1	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
393	JOHN LEWIS CHILDS ELEMENTARY	INT	1	3640	OFFICE ASSISTANT PRINCIPAL	OSW-1G		2424T8-28	2	T8-28	48	LED2X10.5TUBE4FT-DEP	2	2	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	4	T8 Elec Ballasts	2	0.1	349.4	0.0	157.2	0.1	192.2
394	JOHN LEWIS CHILDS ELEMENTARY	INT	1	800	STAGE			I120	20	INC	120	LED12A19	20	20	LED	LED-SI	12	0	90%	108	120 Watt Inc	Incandescent Lamp	20	In Lamp	0	2.4	1920.0	0.2	192.0	2.2	1728.0
395	JOHN LEWIS CHILDS ELEMENTARY	INT	1	800	STAGE L&R		DRUM	CF18	2	CFL	20	LED10-DRUMINT	2	2	LED	LED-NF	10	0	50%	10	18 Watt CFL	Compact Fluorescent Lamp	2	0	0	0.0	32.0	0.0	16.0	0.0	16.0
396	JOHN LEWIS CHILDS ELEMENTARY	INT	1	800	STAGE LIGHTING			CF18	48	CFL	20	LED9A19	48	48	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	48	0	0	1.0	768.0	0.4	345.6	0.5	422.4
397	JOHN LEWIS CHILDS ELEMENTARY	INT	1	800	STAGE LIGHTING			I60	6	INC	60	LED9A19	6	6	LED	LED-SI	9	0	85%	51	60 Watt Inc	Incandescent Lamp	6	In Lamp	0	0.4	288.0	0.1	43.2	0.3	244.8
398	JOHN LEWIS CHILDS ELEMENTARY	INT	1	800	STAGE LIGHTING			LED	28	LED	0	NR	28	28	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
399	JOHN LEWIS CHILDS ELEMENTARY	INT	1	800	FRONT STAGE		DIMMABLE / ADJ SPOTS	HIR75PAR38	20	HIR	75	LED14PAR38	20	20	LED	LED-SI	14	0	82%	62	75 Watt Halogen, PAR 38	Halogen Lamp	20	0	0	1.5	1200.0	0.3	216.0	1.2	984.0
400	JOHN LEWIS CHILDS ELEMENTARY	INT	1	800	AUDITORIUM		DECO WALL SCONCE	Q250	10	QUARTZ	250	LED6SCONCE-K	10	10	LED	LED-KIT	6	0	98%	244	250 Watt Quartz	Quartz Lamp	10	In Lamp	0	2.5	2000.0	0.1	48.0	2.4	1952.0
401	JOHN LEWIS CHILDS ELEMENTARY	INT	1	3614	AUDITORIUM		DECO SALAD BOWL	Q5X100	10	QUARTZ	500	LED5X12A19	10	10	LED	LED-SI	60	0	88%	440	(5) 100 Watt Quartz	Quartz Lamp	50	In Lamp	0	5.0	18070.0	0.6	2168.4	4.4	15901.6
402	JOHN LEWIS CHILDS ELEMENTARY	INT	1	8760	AUDITORIUM			KLED-BB	3	LED-EXIT	2	NR	3	3	NO CHANGE	NO CHANGE	2	0	0%	0	Exit Sign, Battery Backup, Universal, MultiTap	LED Lamp	0	0	0	0.0	52.6	0.0	52.6	0.0	0.0
403	JOHN LEWIS CHILDS ELEMENTARY	INT	1	2499	BATH BOYS		2X4 FLAT PANEL	LED	6	LED	0	NR	6	6	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
404	JOHN LEWIS CHILDS ELEMENTARY	INT	1	2499	FACULTY REST ROOM		2X4 FLAT PANEL	LED	1	LED	0	NR	1	1	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
405	JOHN LEWIS CHILDS ELEMENTARY	INT	1	4228	HALLWAY AT ELEVATOR		WRAP	1414T8-28	2	T8-28	24	LED1X10.5TUBE4FT-DEP	2	2	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	2	0.0	202.9	0.0	91.3	0.0	111.6
406	JOHN LEWIS CHILDS ELEMENTARY	INT	1	4228	HALLWAY AT ELEVATOR			2222T8	21	T8-17	37	LED2X9TUBE2FT-DEP	21	21	LED	LED-RL	19	0	48%	18	2x2 fixture with (2) 2' Lamps T8	T8 Lamps 2'	42	T8 Elec Ballasts	21	0.8	3285.2	0.4	1704.7	0.4	1580.4
407	JOHN LEWIS CHILDS ELEMENTARY	INT	1	4228	HALLWAY AT ELEVATOR		8" RC	PL2X26	3	CFL	54	LED8RC6-TK	3	3	LED	LED-KIT	8	0	85%	46	(2) 26 Watt CFL Plug In, 2 Pin	Compact Fluorescent Lamp	6	0	0	0.2	684.9	0.0	101.5	0.1	583.5
408	JOHN LEWIS CHILDS ELEMENTARY	INT	1	8760	HALLWAY AT ELEVATOR			KLED-BB-FE	4	LED-EXIT	2	NR	4	4	NO CHANGE	NO CHANGE	2	0	0%	0	Install a new LED Exit Sign, Battery Backup, Frog Eyes	LED Lamp	0	0	0	0.0	70.1	0.0	70.1	0.0	0.0
409	JOHN LEWIS CHILDS ELEMENTARY	INT	1	1600	CLASS 117	OSC-1D		2424T8-28	7	T8-28	48	LED2X10.5TUBE4FT-DEP	7	7	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	14	T8 Elec Ballasts	7	0.3	537.6	0.2	241.9	0.2	295.7
410	JOHN LEWIS CHILDS ELEMENTARY	INT	1	2499	CLASS 117 BATH	OSW-1G		2424T8-28	1	T8-28	48	LED2X10.5TUBE4FT-DEP	1	1	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	1	0.0	120.0	0.0	54.0	0.0	66.0
411	JOHN LEWIS CHILDS ELEMENTARY	INT	1	1600	CLASS 118	OSC-1D		2424T8-28	7	T8-28	48	LED2X10.5TUBE4FT-DEP	7	7	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	14	T8 Elec Ballasts	7	0.3	537.6	0.2	241.9	0.2	295.7
412	JOHN LEWIS CHILDS ELEMENTARY	INT	1	2499	CLASS 118 REST ROOM	OSW-1G		2424T8-28	1	T8-28	48	LED2X10.5TUBE4FT-DEP	1	1	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	1	0.0	120.0	0.0	54.0	0.0	66.0
413	JOHN LEWIS CHILDS ELEMENTARY	INT	1	1600	CLASS 119	OSC-1D		2424T8-28	7	T8-28	48	LED2X10.5TUBE4FT-DEP	7	7	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	14	T8 Elec Ballasts	7	0.3	537.6	0.2	241.9	0.2	295.7
414	JOHN LEWIS CHILDS ELEMENTARY	INT	1	2499	CLASS 119 REST ROOM	OSW-1G		2424T8-28	1	T8-28	48	LED2X10.5TUBE4FT-DEP	1	1	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	1	0.0	120.0	0.0	54.0	0.0	66.0

Floral Park-Bellerose UFSD
Exhibit G-5-1
ECM 1 - LED Lighting and Lighting Controls Upgrade

Line #	SITE/ BUILDING	INT/ EXT	Floor/EXT	Annual Hours	Location Description	Switch	TYPE/ MOUNT	EXISTING CODE	Existing QTY	EXISTING TECH	Existing Watts	PROPOSED CODE	Proposal QTY	REMAIN	PROPOSED TECH	RETRO CODE	Proposed Watts	SENSORS REMAIN	Wattage Reduction percentage	UNIT WATT SAVINGS	EXISTING DESCRIPTION	EXISTING LAMP	E lamp total qty	EXISTING Ballast	E ballast total qty	Total kW Existing	Total kWh Existing	Total kW Proposed	Total kWh Proposed	Total kW Saved	Total kWh Saved
415	JOHN LEWIS CHILDS ELEMENTARY	INT	1	1600	CLASS 120	OSC-1D		2424T8-28	7	T8-28	48	LED2X10.5TUBE4FT-DEP	7	7	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	14	T8 Elec Ballasts	7	0.3	537.6	0.2	241.9	0.2	295.7
416	JOHN LEWIS CHILDS ELEMENTARY	INT	1	2499	CLASS 120 REST ROOM	OSW-1G		2424T8-28	1	T8-28	48	LED2X10.5TUBE4FT-DEP	1	1	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	1	0.0	120.0	0.0	54.0	0.0	66.0
417	JOHN LEWIS CHILDS ELEMENTARY	INT	1	800	STORAGE NEAR ELEVATOR			CF18	3	CFL	20	LED9A19	3	3	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	3	0	0	0.1	48.0	0.0	21.6	0.0	26.4
418	JOHN LEWIS CHILDS ELEMENTARY	INT	1	3614	LIBRARY			2424T8-28	22	T8-28	48	LED2X10.5TUBE4FT-DEP	22	22	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	44	T8 Elec Ballasts	22	1.1	3816.4	0.5	1717.4	0.6	2099.0
419	JOHN LEWIS CHILDS ELEMENTARY	INT	1	8760	LIBRARY			KLED-BB-FE	2	LED-EXIT	2	NR	2	2	NO CHANGE	NO CHANGE	2	0	0%	0	Install a new LED Exit Sign, Battery Backup, Frog Eyes	LED Lamp	0	0	0	0.0	35.0	0.0	35.0	0.0	0.0
420	JOHN LEWIS CHILDS ELEMENTARY	INT	1	2499	LIBRARY REST ROOM			CF2X13	2	CFL	30	LED2X9A19	2	2	LED	LED-SI	18	0	40%	12	(2) 13 Watt CFL	Compact Fluorescent Lamp	4	0	0	0.1	149.9	0.0	90.0	0.0	60.0
421	JOHN LEWIS CHILDS ELEMENTARY	INT	1	3614	GYM (SOUTH)	FMS-277	HB	1444T5HO	20	T5HO-54	234	LED4X25TUBE T54FT-SOCKETS	20	20	LED	LED-RL-SCKTS	100	0	57%	134	1x4 fixture with (4) 4' Lamps T5 High Output	T5 Lamps 4' HO	80	T5 Elec Ballasts	0	4.7	16913.5	2.0	7228.0	2.7	9685.5
422	JOHN LEWIS CHILDS ELEMENTARY	INT	1	8760	GYM (SOUTH)			KLED-BB	2	LED-EXIT	2	NR	2	2	NO CHANGE	NO CHANGE	2	0	0%	0	Exit Sign, Battery Backup, Universal, MultiTap	LED Lamp	0	0	0	0.0	35.0	0.0	35.0	0.0	0.0
423	JOHN LEWIS CHILDS ELEMENTARY	INT	1	3614	GYM (NORTH)	FMS-277	HB	1444T5HO	18	T5HO-54	234	LED4X25TUBE T54FT-SOCKETS	18	18	LED	LED-RL-SCKTS	100	0	57%	134	1x4 fixture with (4) 4' Lamps T5 High Output	T5 Lamps 4' HO	72	T5 Elec Ballasts	0	4.2	15222.2	1.8	6505.2	2.4	8717.0
424	JOHN LEWIS CHILDS ELEMENTARY	INT	1	8760	GYM (NORTH)			KLED-BB	2	LED-EXIT	2	NR	2	2	NO CHANGE	NO CHANGE	2	0	0%	0	Exit Sign, Battery Backup, Universal, MultiTap	LED Lamp	0	0	0	0.0	35.0	0.0	35.0	0.0	0.0
425	JOHN LEWIS CHILDS ELEMENTARY	INT	1	1600	GYM STORAGE			CF18	2	CFL	20	LED9A19	2	2	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	2	0	0	0.0	64.0	0.0	28.8	0.0	35.2
426	JOHN LEWIS CHILDS ELEMENTARY	INT	1	1600	GYM STORAGE			1414T8-28	2	T8-28	24	LED1X10.5TUBE4FT-DEP	2	2	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	2	0.0	76.8	0.0	34.6	0.0	42.2
427	JOHN LEWIS CHILDS ELEMENTARY	INT	1	4228	HALLWAY REAR			2424T8-28	8	T8-28	48	LED2X10.5TUBE4FT-DEP	8	8	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	16	T8 Elec Ballasts	8	0.4	1623.6	0.2	730.6	0.2	893.0
428	JOHN LEWIS CHILDS ELEMENTARY	INT	1	8760	HALLWAY			KLED-BB-FE	3	LED-EXIT	2	NR	3	3	NO CHANGE	NO CHANGE	2	0	0%	0	Install a new LED Exit Sign, Battery Backup, Frog Eyes	LED Lamp	0	0	0	0.0	52.6	0.0	52.6	0.0	0.0
429	JOHN LEWIS CHILDS ELEMENTARY	INT	1	800	BOYS RESTROOM		2X2 FLAT PANEL	LED	2	LED	0	NR	2	2	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
430	JOHN LEWIS CHILDS ELEMENTARY	INT	1	800	CUSTODIAL CLOSET			CF18	1	CFL	20	LED9A19	1	1	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	1	0	0	0.0	16.0	0.0	7.2	0.0	8.8
431	JOHN LEWIS CHILDS ELEMENTARY	INT	1	2318	OFFICE COACH	OSC-1D	2X2 FLAT PANEL	LED	1	LED	0	NR	1	1	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
432	JOHN LEWIS CHILDS ELEMENTARY	INT	1	2318	OFFICE COACH		2X2 BBU	LED	1	LED	0	NR	1	1	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
433	JOHN LEWIS CHILDS ELEMENTARY	INT	1	800	GIRLS RESTROOM	OSC-1D	2X2 FLAT PANEL	LED	2	LED	0	NR	2	2	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
434	JOHN LEWIS CHILDS ELEMENTARY	INT	1	1600	CLASS 103	OSC-1D	2X2 FLAT PANEL	LED	9	LED	0	NR	9	9	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
435	JOHN LEWIS CHILDS ELEMENTARY	INT	1	1600	CLASS 104	OSC-1D-3P	8' WRAP	1824T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4
436	JOHN LEWIS CHILDS ELEMENTARY	INT	1	1600	CLASS 105	OSC-1D-3P	8' WRAP	1824T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4
437	JOHN LEWIS CHILDS ELEMENTARY	INT	1	1800	CLASS 105 REST ROOM			2222T8	1	T8-17	37	LED2X9TUBE2FT-DEP	1	1	LED	LED-RL	19	0	48%	18	2x2 fixture with (2) 2' Lamps T8	T8 Lamps 2'	2	T8 Elec Ballasts	1	0.0	66.6	0.0	34.6	0.0	32.0

Floral Park-Bellerose UFSD
Exhibit G-5-1
ECM 1 - LED Lighting and Lighting Controls Upgrade

Line #	SITE/ BUILDING	INT/ EXT	Floor/EXT	Annual Hours	Location Description	Switch	TYPE/ MOUNT	EXISTING CODE	Existing QTY	EXISTING TECH	Existing Watts	PROPOSED CODE	Proposal QTY	REMAIN	PROPOSED TECH	RETRO CODE	Proposed Watts	SENSORS REMAIN	Wattage Reduction percentage	UNIT WATT SAVINGS	EXISTING DESCRIPTION	EXISTING LAMP	E lamp total qty	EXISTING Ballast	E ballast total qty	Total kW Existing	Total kWh Existing	Total kW Proposed	Total kWh Proposed	Total kW Saved	Total kWh Saved
438	JOHN LEWIS CHILDS ELEMENTARY	INT	1	4228	HALLWAY MAIN			2424T8-28	18	T8-28	48	LED2X10.5TUBE4FT-DEP	18	18	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	36	T8 Elec Ballasts	18	0.9	3653.0	0.4	1643.8	0.5	2009.1
439	JOHN LEWIS CHILDS ELEMENTARY	INT	1	8760	HALLWAY MAIN		SIDE MOUNT	KLED-BB	2	LED-EXIT	2	NR	2	2	NO CHANGE	NO CHANGE	2	0	0%	0	Exit Sign, Battery Backup, Universal, MultiTap	LED Lamp	0	0	0	0.0	35.0	0.0	35.0	0.0	0.0
440	JOHN LEWIS CHILDS ELEMENTARY	INT	1	8760	HALLWAY MAIN			LED	4	LED	0	NR	4	4	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
441	JOHN LEWIS CHILDS ELEMENTARY	INT	B	3614	CAFETERIA			2424T8-28	20	T8-28	48	LED2X10.5TUBE4FT-DEP	20	20	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	40	T8 Elec Ballasts	20	1.0	3469.4	0.4	1561.2	0.5	1908.2
442	JOHN LEWIS CHILDS ELEMENTARY	INT	B	3614	CAFETERIA			1414T8-28	9	T8-28	24	LED1X10.5TUBE4FT-DEP	9	9	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	9	T8 Elec Ballasts	9	0.2	780.6	0.1	351.3	0.1	429.3
443	JOHN LEWIS CHILDS ELEMENTARY	INT	B	8760	CAFETERIA			KLED-BB	4	LED-EXIT	2	NR	4	4	NO CHANGE	NO CHANGE	2	0	0%	0	Exit Sign, Battery Backup, Universal, MultiTap	LED Lamp	0	0	0	0.0	70.1	0.0	70.1	0.0	0.0
444	JOHN LEWIS CHILDS ELEMENTARY	INT	B	3614	CAFETERIA		WRAP	1414T8-28	1	T8-28	24	LED1X10.5TUBE4FT-DEP	1	1	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	1	T8 Elec Ballasts	1	0.0	86.7	0.0	39.0	0.0	47.7
445	JOHN LEWIS CHILDS ELEMENTARY	INT	B	4228	STAIRWAY TO CAFETERIA			KLED-BB-FE	1	LED-EXIT	2	NR	1	1	NO CHANGE	NO CHANGE	2	0	0%	0	Install a new LED Exit Sign, Battery Backup, Frog Eyes	LED Lamp	0	0	0	0.0	8.5	0.0	8.5	0.0	0.0
446	JOHN LEWIS CHILDS ELEMENTARY	INT	B	4228	STAIRWAY TO CAFETERIA			2222T8	1	T8-17	37	LED2X9TUBE2FT-DEP	1	1	LED	LED-RL	19	0	48%	18	2x2 fixture with (2) 2' Lamps T8	T8 Lamps 2'	2	T8 Elec Ballasts	1	0.0	156.4	0.0	81.2	0.0	75.3
447	JOHN LEWIS CHILDS ELEMENTARY	INT	B	4228	STAIRWAY TO CAFETERIA		WRAP	1414T8-28	3	T8-28	24	LED1X10.5TUBE4FT-DEP	3	3	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	3	T8 Elec Ballasts	3	0.1	304.4	0.0	137.0	0.0	167.4
448	JOHN LEWIS CHILDS ELEMENTARY	INT	B	800	UTILITY			CF18	1	CFL	20	LED9A19	1	1	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	1	0	0	0.0	16.0	0.0	7.2	0.0	8.8
449	JOHN LEWIS CHILDS ELEMENTARY	INT	B	800	DISHWASHING		2X4	LED	4	LED	0	NR	4	4	NO CHANGE	NO CHANGE	0	1	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
450	JOHN LEWIS CHILDS ELEMENTARY	INT	B	3614	KITCHEN		WRAP	1414T8-28	7	T8-28	24	LED1X10.5TUBE4FT-DEP	7	7	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	7	T8 Elec Ballasts	7	0.2	607.2	0.1	273.2	0.1	333.9
451	JOHN LEWIS CHILDS ELEMENTARY	INT	B	800	DRY STORAGE		JJ	CF18	3	CFL	20	LED9A19	3	3	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	3	0	0	0.1	48.0	0.0	21.6	0.0	26.4
452	JOHN LEWIS CHILDS ELEMENTARY	INT	B	800	KITCHEN BATH		KEYLESS	CF18	1	CFL	20	LED10-DRUMINT	1	1	LED	LED-NF	10	0	50%	10	18 Watt CFL	Compact Fluorescent Lamp	1	0	0	0.0	16.0	0.0	8.0	0.0	8.0
453	JOHN LEWIS CHILDS ELEMENTARY	INT	B	4228	HALLWAY RAMP			2222T8	4	T8-17	37	LED2X9TUBE2FT-DEP	4	4	LED	LED-RL	19	0	48%	18	2x2 fixture with (2) 2' Lamps T8	T8 Lamps 2'	8	T8 Elec Ballasts	4	0.1	625.7	0.1	324.7	0.1	301.0
454	JOHN LEWIS CHILDS ELEMENTARY	INT	B	8760	HALLWAY RAMP			KLED-BB	2	LED-EXIT	2	NR	2	2	NO CHANGE	NO CHANGE	2	0	0%	0	Exit Sign, Battery Backup, Universal, MultiTap	LED Lamp	0	0	0	0.0	35.0	0.0	35.0	0.0	0.0
455	JOHN LEWIS CHILDS ELEMENTARY	INT	B	1600	MUSIC ROOM	OSC-1D		2424T8-28	11	T8-28	48	LED2X10.5TUBE4FT-DEP	11	11	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	22	T8 Elec Ballasts	11	0.5	844.8	0.2	380.2	0.3	464.6
456	JOHN LEWIS CHILDS ELEMENTARY	INT	B	1600	ART ROOM	OSC-1D		2424T8-28	11	T8-28	48	LED2X10.5TUBE4FT-DEP	11	11	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	22	T8 Elec Ballasts	11	0.5	844.8	0.2	380.2	0.3	464.6
457	JOHN LEWIS CHILDS ELEMENTARY	INT	B	2499	BATH GIRLS	OSC-1D	2X4 FLAT PANEL	LED	3	LED	0	NR	3	3	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
458	JOHN LEWIS CHILDS ELEMENTARY	INT	B	2499	BATH BOYS	OSC-1D	2X4 FLAT PANEL	LED	3	LED	0	NR	3	3	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
459	JOHN LEWIS CHILDS ELEMENTARY	INT	B	3614	FACULTY LOUNGE	OSW-1G		2424T8-28	3	T8-28	48	LED2X10.5TUBE4FT-DEP	3	3	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	6	T8 Elec Ballasts	3	0.1	520.4	0.1	234.2	0.1	286.2
460	JOHN LEWIS CHILDS ELEMENTARY	INT	B	2499	FACULTY LOUNGE BATH	OSW-1G		2424T8-28	1	T8-28	48	LED2X10.5TUBE4FT-DEP	1	1	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	1	0.0	120.0	0.0	54.0	0.0	66.0

Floral Park-Bellerose UFSD
Exhibit G-5-1
ECM 1 - LED Lighting and Lighting Controls Upgrade

Line #	SITE/ BUILDING	INT/ EXT	Floor/E XT	Annual Hours	Location Description	Switch	TYPE/ MOUNT	EXISTING CODE	Existing QTY	EXISTING TECH	Existing Watts	PROPOSED CODE	Proposal QTY	REMAIN	PROPOSED TECH	RETRO CODE	Proposed Watts	SENSORS REMAIN	Wattage Reduction percentage	UNIT WATT SAVINGS	EXISTING DESCRIPTION	EXISTING LAMP	E lamp total qty	EXISTING Ballast	E ballast total qty	Total kW Existing	Total kWh Existing	Total kW Proposed	Total kWh Proposed	Total kW Saved	Total kWh Saved
461	JOHN LEWIS CHILDS ELEMENTARY	INT	B	2318	ROOM 12 FACULTY	OSW-1G		2424T8-28	2	T8-28	48	LED2X10.5TUBE4FT-DEP	2	2	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	4	T8 Elec Ballasts	2	0.1	222.5	0.0	100.1	0.1	122.4
462	JOHN LEWIS CHILDS ELEMENTARY	INT	B	1600	MUSIC ROOM 8	OSW-1G		2424T8-28	6	T8-28	48	LED2X10.5TUBE4FT-DEP	6	6	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	12	T8 Elec Ballasts	6	0.3	460.8	0.1	207.4	0.2	253.4
463	JOHN LEWIS CHILDS ELEMENTARY	INT	B	800	MECH/STORAGE			1824T8-28	1	T8-28	48	LED2X10.5TUBE4FT-DEP	1	1	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	1	0.0	38.4	0.0	17.3	0.0	21.1
464	JOHN LEWIS CHILDS ELEMENTARY	INT	B	800	MECH/STORAGE			2424T8-28	4	T8-28	48	LED2X10.5TUBE4FT-DEP	4	4	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	8	T8 Elec Ballasts	4	0.2	153.6	0.1	69.1	0.1	84.5
465	JOHN LEWIS CHILDS ELEMENTARY	INT	B	1600	STORAGE / SUPPLY ROOM		WRAP	1414T8-28	1	T8-28	24	LED1X10.5TUBE4FT-DEP	1	1	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	1	T8 Elec Ballasts	1	0.0	38.4	0.0	17.3	0.0	21.1
466	JOHN LEWIS CHILDS ELEMENTARY	INT	B	1600	COPY ROOM			2424T8-28	2	T8-28	48	LED2X10.5TUBE4FT-DEP	2	2	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	4	T8 Elec Ballasts	2	0.1	153.6	0.0	69.1	0.1	84.5
467	JOHN LEWIS CHILDS ELEMENTARY	INT	B	800	STORE ROOM		WRAP	1414T8-28	1	T8-28	24	LED1X10.5TUBE4FT-DEP	1	1	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	1	T8 Elec Ballasts	1	0.0	19.2	0.0	8.6	0.0	10.6
468	JOHN LEWIS CHILDS ELEMENTARY	INT	B	800	STORE ROOM			CF18	1	CFL	20	LED9A19	1	1	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	1	0	0	0.0	16.0	0.0	7.2	0.0	8.8
469	JOHN LEWIS CHILDS ELEMENTARY	INT	B	800	BOILER ROOM			2444T8-28	6	T8-28	94	LED4X10.5TUBE4FT-DEP	6	6	LED	LED-RL	43	0	54%	51	2x4 fixture with (4) 4' Lamps T8 28W	T8 Lamps 4'	24	T8 Elec Ballasts	6	0.6	451.2	0.3	207.4	0.3	243.8
470	JOHN LEWIS CHILDS ELEMENTARY	INT	B	800	BATTERY/COMPRESSOR ROOM			CF18	1	CFL	20	LED9A19	1	1	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	1	0	0	0.0	16.0	0.0	7.2	0.0	8.8
471	JOHN LEWIS CHILDS ELEMENTARY	INT	B	800	SUPPLY			CF32	1	CFL	34	LED12A19	1	1	LED	LED-SI	12	0	65%	22	32 Watt CFL	Compact Fluorescent Lamp	1	0	0	0.0	27.2	0.0	9.6	0.0	17.6
472	JOHN LEWIS CHILDS ELEMENTARY	INT	B	800	BOILER ROOM HALL B			KLED-BB	1	LED-EXIT	2	NR	1	1	NO CHANGE	NO CHANGE	2	0	0%	0	Exit Sign, Battery Backup, Universal, MultiTap	LED Lamp	0	0	0	0.0	1.6	0.0	1.6	0.0	0.0
473	JOHN LEWIS CHILDS ELEMENTARY	INT	B	4228	HALLWAY			2222T8	6	T8-17	37	LED2X9TUBE2FT-DEP	6	6	LED	LED-RL	19	0	48%	18	2x2 fixture with (2) 2' Lamps T8	T8 Lamps 2'	12	T8 Elec Ballasts	6	0.2	938.6	0.1	487.1	0.1	451.6
474	JOHN LEWIS CHILDS ELEMENTARY	INT	B	4228	HALLWAY			2222T8	9	T8-17	37	LED2X9TUBE2FT-DEP	9	9	LED	LED-RL	19	0	48%	18	2x2 fixture with (2) 2' Lamps T8	T8 Lamps 2'	18	T8 Elec Ballasts	9	0.3	1407.9	0.2	730.6	0.2	677.3
475	JOHN LEWIS CHILDS ELEMENTARY	INT	B	8760	HALLWAY			LED	3	LED	0	NR	3	3	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
476	JOHN LEWIS CHILDS ELEMENTARY	INT	B	800	UTILITY STORAGE			CF18	2	CFL	20	LED9A19	2	2	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	2	0	0	0.0	32.0	0.0	14.4	0.0	17.6
477	JOHN LEWIS CHILDS ELEMENTARY	INT	B	4228	HALLWAY CUSTODIAL			2222T8	3	T8-17	37	LED2X9TUBE2FT-DEP	3	3	LED	LED-RL	19	0	48%	18	2x2 fixture with (2) 2' Lamps T8	T8 Lamps 2'	6	T8 Elec Ballasts	3	0.1	469.3	0.1	243.5	0.1	225.8
478	JOHN LEWIS CHILDS ELEMENTARY	INT	B	4228	HALLWAY HANDICAP		WRAP	1414T8-28	3	T8-28	24	LED1X10.5TUBE4FT-DEP	3	3	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	3	T8 Elec Ballasts	3	0.1	304.4	0.0	137.0	0.0	167.4
479	JOHN LEWIS CHILDS ELEMENTARY	INT	B	800	ELEVATOR ROOM			2424T8-28	1	T8-28	48	LED2X10.5TUBE4FT-DEP	1	1	LED	LED-RL	22	0	55%	26	2x4 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	1	0.0	38.4	0.0	17.3	0.0	21.1
480	JOHN LEWIS CHILDS ELEMENTARY	INT	B	800	UTILITY			CF18	1	CFL	20	LED9A19	1	1	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	1	0	0	0.0	16.0	0.0	7.2	0.0	8.8
481	JOHN LEWIS CHILDS ELEMENTARY	INT	B	800	UTILITY			CF18	1	CFL	20	LED9A19	1	1	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	1	0	0	0.0	16.0	0.0	7.2	0.0	8.8
482	JOHN LEWIS CHILDS ELEMENTARY	INT	B	1600	CUSTODIAL OFFICE		8' WRAP	1824T8-28	2	T8-28	48	LED2X10.5TUBE4FT-DEP	2	2	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	4	T8 Elec Ballasts	2	0.1	153.6	0.0	69.1	0.1	84.5
483	JOHN LEWIS CHILDS ELEMENTARY	INT	B	2318	OFFICE		WRAP	1414T8-28	2	T8-28	24	LED1X10.5TUBE4FT-DEP	2	2	LED	LED-RL	11	0	55%	13	1x4 fixture with (1) 4' Lamp T8 28W	T8 Lamps 4'	2	T8 Elec Ballasts	2	0.0	111.3	0.0	50.1	0.0	61.2

Floral Park-Bellerose UFSD
Exhibit G-5-1
ECM 1 - LED Lighting and Lighting Controls Upgrade

Line #	SITE/ BUILDING	INT/ EXT	Floor/EXT	Annual Hours	Location Description	Switch	TYPE/ MOUNT	EXISTING CODE	Existing QTY	EXISTING TECH	Existing Watts	PROPOSED CODE	Proposal QTY	REMAIN	PROPOSED TECH	RETRO CODE	Proposed Watts	SENSORS REMAIN	Wattage Reduction percentage	UNIT WATT SAVINGS	EXISTING DESCRIPTION	EXISTING LAMP	E lamp total qty	EXISTING Ballast	E ballast total qty	Total kW Existing	Total kWh Existing	Total kW Proposed	Total kWh Proposed	Total kW Saved	Total kWh Saved
484	JOHN LEWIS CHILDS ELEMENTARY	INT	B	800	CUSTODIAL OFFICE / STORAGE			CF18	1	CFL	20	LED9A19	1	1	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	1	0	0	0.0	16.0	0.0	7.2	0.0	8.8
485	JOHN LEWIS CHILDS ELEMENTARY	INT	B	3614	PIPE CHASE			CF18	10	CFL	20	LED9A19	10	10	LED	LED-SI	9	0	55%	11	18 Watt CFL	Compact Fluorescent Lamp	10	0	0	0.2	722.8	0.1	325.3	0.1	397.5
486	JOHN LEWIS CHILDS ELEMENTARY	INT	B	3614	MAINTENANCE SHOP		8' WRAP	1824T8-28	2	T8-28	48	LED2X10.5TUBE4FT-DEP	2	2	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	4	T8 Elec Ballasts	2	0.1	346.9	0.0	156.1	0.1	190.8
487	JOHN LEWIS CHILDS ELEMENTARY	INT	B	3614	MAINTENANCE SHOP		8' WRAP	1824T8-28	2	T8-28	48	LED2X10.5TUBE4FT-DEP	2	2	LED	LED-RL	22	0	55%	26	1x8 fixture with (2) 4' Lamps T8 28W	T8 Lamps 4'	4	T8 Elec Ballasts	2	0.1	346.9	0.0	156.1	0.1	190.8
488	JOHN LEWIS CHILDS ELEMENTARY	EXT	EXT	4380	FRONT WALLS		WP	LED	3	LED	0	NR	3	3	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
489	JOHN LEWIS CHILDS ELEMENTARY	EXT	EXT	4380	FRONT ENT #2		WP / SEMI CUT OFF	S50	1	HPS	65	LED18WP-PC	1	1	LED	LED-NF-X	18	0	72%	47	50 Watt High Pressure Sodium	Pressure Sodium Lamp	1	Pressure Sodium Ballasts	1	0.1	284.7	0.0	78.8	0.0	205.9
490	JOHN LEWIS CHILDS ELEMENTARY	EXT	EXT	4380	FRONT MAIN ENT		ACORN POLE	LED	2	LED	0	NR	2	2	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
491	JOHN LEWIS CHILDS ELEMENTARY	EXT	EXT	4380	SIDE ENT 15		COACH / WALL	LED	2	LED	0	NR	2	2	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
492	JOHN LEWIS CHILDS ELEMENTARY	EXT	EXT	4380	SIDE ENT 14		DRUM	LED	1	LED	0	NR	1	1	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
493	JOHN LEWIS CHILDS ELEMENTARY	EXT	EXT	4380	BACK WALLS		WP	LED	10	LED	0	NR	10	10	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
494	JOHN LEWIS CHILDS ELEMENTARY	EXT	EXT	4380	BACK WALLS		WP / RECESSED	S150	5	HPS	190	LED24CORNCOB	5	5	LED	LED-KIT	24	0	87%	166	150 Watt High Pressure Sodium	Pressure Sodium Lamp	5	Pressure Sodium Ballasts	5	1.0	4161.0	0.1	525.6	0.8	3635.4
495	JOHN LEWIS CHILDS ELEMENTARY	EXT	EXT	4380	BACK EXIT 13		DRUM	LED	1	LED	0	NR	1	1	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
496	JOHN LEWIS CHILDS ELEMENTARY	EXT	EXT	4380	BACK EXIT 12		WP	S35	1	HPS	45	LED18WP-PC	1	1	LED	LED-NF-X	18	0	60%	27	35 Watt High Pressure Sodium	Pressure Sodium Lamp	1	Pressure Sodium Ballasts	0	0.0	197.1	0.0	78.8	0.0	118.3
497	JOHN LEWIS CHILDS ELEMENTARY	EXT	EXT	4380	BACK EXIT 11		DRUM	LED	1	LED	0	NR	1	1	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
498	JOHN LEWIS CHILDS ELEMENTARY	EXT	EXT	4380	BACK EXIT 10		DRUM	LED	1	LED	0	NR	1	1	NO CHANGE	NO CHANGE	0	0	0%	0	LED EXISTING	LED Lamp	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
499	JOHN LEWIS CHILDS ELEMENTARY	EXT	EXT	4380	GYM SIDE DOOR 6		WP / SEMI CUT OFF	S35	1	HPS	45	LED18WP-PC	1	1	LED	LED-NF-X	18	0	60%	27	35 Watt High Pressure Sodium	Pressure Sodium Lamp	1	Pressure Sodium Ballasts	0	0.0	197.1	0.0	78.8	0.0	118.3
500	JOHN LEWIS CHILDS ELEMENTARY	EXT	EXT	4380	GYM SIDE DOOR 5		WP / SEMI CUT OFF	S35	1	HPS	45	LED18WP-PC	1	1	LED	LED-NF-X	18	0	60%	27	35 Watt High Pressure Sodium	Pressure Sodium Lamp	1	Pressure Sodium Ballasts	0	0.0	197.1	0.0	78.8	0.0	118.3

Floral Park-Bellerose UFSD
Exhibit D-5-2
ECM 2 - Boiler Plant Upgrade
Boiler Efficiency Spreadsheet

*Inputs are blue Add Controlink ECM savings to Boiler Upgrades N
*Automatic Mechanical List pull-in colored purple

EXISTING												
Building	Equipment Label	Qty	Location	Boiler(s) Replaced [Y/N]	Add Burner Controls (Y/N)	Existing Fuel	Manufacturer	Model No.	Total Input Capacity [MBH]	Heating Medium	Combustion Efficiency	Percentage of Building Served
Administration Building	A-Boiler	1	Basement	N	N	Natural Gas		207NCL - TEI2	198	Hot Water	82.3%	100%
Floral Park Elementary School	FP-Boilers	2	Boiler Room	N	N	Natural Gas	HB Smith	4500A - S/W - 20	8,761	Steam	80.7%	100%
John Lewis Childs School	JLCS-Boiler 1	1	Boiler Room	Y	N	Natural Gas	HB Smith	640 Mills - 13 Section	5,700	Steam	75.0%	100%
John Lewis Childs School	JLCS-Boiler 2	1	Boiler Room	N	N	Natural Gas	HB Smith	4500A Mills Boiler MB99 - 78	5,856	Steam	80.0%	25%
Totals		5							20,515			

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
Administration Building	A-Boiler	N							82.3%	100.0%
Floral Park Elementary School	FP-Boilers	N							80.7%	100.0%
John Lewis Childs School	JLCS-Boiler 1	Y	1	Natural Gas	Weil McLAIN		5,250	Steam	81.5%	100.0%
John Lewis Childs School	JLCS-Boiler 2	N							80.0%	25.0%
Totals			1				5,250			

Floral Park-Bellerose UFSD
Exhibit D-5-2
ECM 2 - Boiler Plant Upgrade
Boiler Efficiency Spreadsheet

EXISTING OVERALL BOILER EFFICIENCY

Building	Administration Building	Floral Park Elementary School	John Lewis Childs School	John Lewis Childs School
Location	Basement	Boiler Room	Boiler Room	Boiler Room
Label	A-Boiler	FP-Boilers	JLCS-Boiler 1	JLCS-Boiler 2
Capacity [MBTU/Hr]	198	8,761	5,700	5,856
Quantity	1	2	1	1
Existing Fuel	Natural Gas	Natural Gas	Natural Gas	Natural Gas
Percentage of Building Load [%]	100%	100%	100%	25%
Heating Medium	Hot Water	Steam	Steam	Steam
Combustion Efficiency [%]	82.3%	80.7%	75.0%	80.0%
Losses Due to Radiation [% of MCR]	**2.0%**	**2.0%**	**3.0%**	**2.0%**
Losses Due to Blowdown [% of MCR]	0.0%	1.5%	1.5%	1.5%
MCR of Boilers [MMBTU/Hr]	0.2	8.8	5.7	5.9
% Makeup Water [%]	**0.0%**	**0.0%**	**0.0%**	**0.0%**
Makeup T.D.S. [PPM]	**80**	**80**	**80**	**80**
Blowdown T.D.S. [PPM]	**3,500**	**3,500**	**3,500**	**3,500**
Annual Boiler Usage [MMBTU]	219	7,510	3,549	887
Feedwater Temperature [°F]	**180**	**180**	**180**	**180**
Condensate Return Temperature [°F]	**200**	**200**	**200**	**200**
Makeup Water Temperature [°F]	**60**	**60**	**60**	**60**
Hours of Operation [Hrs/Yr]	4,016	4,016	4,016	4,016
Blowdown Temperature [°F]	220	220	220	220
Heat Required to Raise a lb of Steam [BTU/lb]	980	980	980	980
Boiler Load Rate [%]	50.0%	50.0%	50.0%	50.0%
Present Blowdown Rate [lbs/lb Steam]	-	-	-	-
Heat Content of Blowdown [BTU/lb]	-	160	160	160
Blowdown Loss [%]	0.0%	0.0%	0.0%	0.0%
Radiation Losses [%]	2.0%	4.0%	6.0%	4.0%
Overall Boiler Efficiency [%]	**80.3%**	**76.7%**	**69.0%**	**76.0%**

Floral Park-Bellerose UFSD
Exhibit D-5-2
ECM 2 - Boiler Plant Upgrade
Boiler Efficiency Spreadsheet

PROPOSED OVERALL BOILER EFFICIENCY

	Administration Building	Floral Park Elementary School	John Lewis Childs School	John Lewis Childs School
Boiler Addition	N	N	Y	N
Burner Control Links	N	N	N	N
Location	Boiler Room	Boiler Room	Boiler Room	Boiler Room
Label	A-Boiler	FP-Boilers	JLCS-Boiler 1	JLCS-Boiler 2
Quantity to be Replaced	-	-	1	-
Percent of Building Load [%]	-	-	100%	-
Proposed Fuel	-	-	Natural Gas	-
Capacity [MBTU/Hr]	-	-	5,250	-
Heating Medium	-	-	Steam	-
Combustion Efficiency [%]	-	-	81.5%	-
Losses Due to Radiation [% of MCR]	1.0%	1.0%	1.0%	1.0%
Losses Due to Blowdown [% of MCR]	2.0%	2.0%	2.0%	2.0%
% Makeup Water [%]	8.0%	8.0%	8.0%	8.0%
Makeup T.D.S. [PPM]	80	80	80	80
Blowdown T.D.S. [PPM]	3,500	3,500	3,500	3,500
Annual Boiler Usage [MMBTU]	-	-	3,549	-
Feedwater Temperature [°F]	180	180	180	180
MCR of Boilers [MMBTU/Hr]	-	-	5.3	-
Condensate Return Temperature [°F]	200	200	200	200
Makeup Water Temperature [°F]	60	60	60	60
Hours of Operation [Hrs/Yr]	4,016	4,016	4,016	4,016
Blowdown Temperature [°F]	220	220	220	220
Heat Required to Raise a lb of Steam [BTU/lb]	980	980	980	980
Boiler Load Rate [%]	-	-	50.0%	-
Present Blowdown Rate [lbs/lb Steam]	-	-	0.0018	-
Heat Content of Blowdown [BTU/lb]	-	-	160.0	-
Blowdown Loss [%]	-	-	2.4%	-
Radiation Losses [%]	-	-	2.0%	-
*Overall Boiler Efficiency [%]	**80.3%**	**76.7%**	**77.1%**	**76.0%**

Floral Park-Bellerose UFSD
Exhibit D-5-2
ECM 2 - Boiler Plant Upgrade

ECM DESCRIPTION

Install a new high efficiency steam boiler. This will 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 [%] = 0%

A safety factor of 0% 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

Floral Park-Bellerose UFSD
Exhibit D-5-2
ECM 2 - Boiler Plant Upgrade

*Inputs are blue

Building	Label	Boilers to be Added
John Lewis Childs School	JLCS-Boiler 1	1
Totals		**1**

CALCULATIONS

	John Lewis Childs School
Label	JLCS-Boiler 1
No. of Units to be Replaced	1
Fuel Switch	N
Existing Fuel	Natural Gas
Proposed Fuel	Natural Gas
Existing Boiler Efficiency [%]	69.0%
Proposed Boiler Efficiency [%]	77.1%
Improvement in Boiler Efficiency [%]	8.1%
Annual Boiler Fuel Use [Therms]	35,488
Adjusted Boiler Usage [Therms]	13,713
Percentage of Building Load [%]	100%
Safety Factor [%]	0%
Thermal Savings [Therms]	1,603

Notes:
Replacing the existing boilers with new, high efficiency units will reduce operating costs at this location.
Improving the air/fuel ratio will increase overall boiler combustion efficiency.

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.
New non-condensing boilers will be equipped with boiler burner controls

Floral Park-Bellerose UFSD
Exhibit D-5-2
ECM 2 - Boiler Plant Upgrade

SAVINGS SUMMARY

Building ID	kWh Savings	kW Savings	Thermal Savings	Safety Factor
	kWh	kW	Therms	%
Administration Building	-	-	-	0.0%
Floral Park Elementary School	-	-	-	0.0%
John Lewis Childs School	-	-	1,603	0.0%
Subtotal	-	-	1,603	

Floral Park-Bellerose UFSD
Exhibit D-5-3
ECM 3 - Building Management System Upgrades

ECM DESCRIPTION

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

DATA / ASSUMPTIONS

Heating Season Hours 4,016 Hours

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

COMMISSIONING

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

RECOVERY/SAFETY FACTOR

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

FORMULAE

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

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

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

Variable	Units	Description
$Q_{savings}$	Therms	Thermal Savings
$\sum^{60}_{-15}$	-	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					PROPOSED											
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]	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]
Administration Building	100%	73	73	74	85						68	55	76	85				
Floral Park Elementary School	100%	72	72	74	85						68	55	76	85				
John Lewis Childs School	100%	72	72	74	85						68	55	76	85				

Floral Park-Bellerose UFSD
Exhibit D-5-3
ECM 3 - Building Management System Upgrades

THERMAL NIGHT SETBACK SAVINGS CALCULATIONS

	Administration Building	Floral Park Elementary School	John Lewis Childs School	
Occupied Bin Hours	4,016	4,016	4,016	Hrs
Occupied Heating Degree Hours [HD-Hrs]	136,405	130,582	130,582	HD-hrs
Annual Boiler Usage [Therms]	2,190	75,099	35,488	Therms / Yr
Adjusted Annual Boiler Usage [Therms]	2,217	63,468	22,113	Therms / Yr
Existing Heating Degree Hours [HD-Hrs]	136,405	130,582	130,582	HD-hrs
Proposed Heating Degree Hours [HD-Hrs]	77,842	80,979	80,979	HD-hrs
Thermal Safety Factor [%]	0%	0%	2%	
Thermal Savings [%]	42.9%	38.0%	37.3%	%
Thermal Savings [Therms]	952	24,109	8,249	Therms / Yr

ELECTRIC NIGHT SETBACK SAVINGS CALCULATIONS

Annual Electric Usage [kWh]	23,060	362,640	274,560	kWh / Yr
Annual Cooling Electric Baseline [kWh]	2,306	36,264	27,456	kWh / Yr
Existing Cooling Degree Hours [CD-Hrs]	8,457	8,457	8,457	HD-hrs
Proposed Cooling Degree Hours [CD-Hrs]	3,103	3,273	3,273	HD-hrs
Electric Normalization Factor [%]	75%	75%	75%	
Electric Safety Factor [%]	0%	0%	0%	%
Electrical Savings [%]	15.8%	15.3%	15.3%	%
Electrical Savings [kWh]	365	5,557	4,208	kWh / Yr

AIR COMPRESSOR REMOVAL SAVINGS CALCULATIONS

Total Air Compressor Power Removed [kW]	-	1.1	1.1
Existing Air Compressor Run Hours [hrs]	-	4,380	4,380
Electric Safety Factor [%]	0%	0%	0%
Electrical Savings [kWh]	-	4,901	4,901

Exhibit D-5: Engineered Cost Avoidance Calculations

Floral Park-Bellerose UFSD
Exhibit D-5-3
ECM 3 - Building Management System Upgrades

ADMINISTRATION BUILDING

						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	85.0	-	-	-	-	-	-	-	-	-	-	-	76.0	85.0	-	-	-
95 to 100	97.5	-	3	-	3	3	-	74.0	85.0	71	-	71	-	-	-	-	-	71	2	1	76.0	85.0	46	11	57
90 to 95	92.5	-	18	3	21	21	0	74.0	85.0	388	0	388	-	-	-	-	-	388	13	8	76.0	85.0	217	59	276
85 to 90	87.5	-	100	18	118	118	0	74.0	85.0	1,593	0	1,593	-	-	-	-	-	1,593	73	45	76.0	85.0	840	112	952
80 to 85	82.5	37	292	126	455	455	0	74.0	85.0	3,867	-	3,867	-	-	-	-	-	3,867	223	232	76.0	85.0	1,450	-	1,450
75 to 80	77.5	189	289	247	725	725	0	74.0	85.0	2,537	-	2,537	-	-	-	-	-	2,537	245	480	76.0	85.0	368	-	368
70 to 75	72.5	275	200	270	745	745	0	74.0	85.0	-	-	-	-	-	-	-	-	-	192	553	76.0	85.0	-	-	-
65 to 70	67.5	236	184	245	665	665	0	74.0	85.0	-	-	-	-	-	-	-	-	-	174	491	76.0	85.0	-	-	-
60 to 65	62.5	232	158	196	586	586	0	74.0	85.0	-	-	-	-	-	-	-	-	-	151	435	76.0	85.0	-	-	-
Total		969	1,244	1,105	3,318	3,318	0			8,457	0	8,457			-	-	-	**8,457**	1,074	2,244			2,921	182	**3,103**
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	73.5	73.5	4,514	0	4,514	-	-	-	-	-	4,514	105	178	68	55	1,099	-	1,099
50 to 55	52.5	110	178	125	413	413	0	73.5	73.5	8,652	0	8,652	-	-	-	-	-	8,652	148	265	68	55	2,296	662	2,958
45 to 50	47.5	108	164	121	393	393	0	73.5	73.5	10,198	0	10,198	-	-	-	-	-	10,198	138	255	68	55	2,821	1,916	4,736
40 to 45	42.5	240	251	280	771	771	0	73.5	73.5	23,862	0	23,862	-	-	-	-	-	23,862	226	545	68	55	5,756	6,816	12,572
35 to 40	37.5	355	282	362	999	999	0	73.5	73.5	35,914	0	35,914	-	-	-	-	-	35,914	265	734	68	55	8,096	12,837	20,933
30 to 35	32.5	239	120	167	526	526	0	73.5	73.5	21,540	0	21,540	-	-	-	-	-	21,540	122	404	68	55	4,330	9,091	13,421
25 to 30	27.5	109	76	81	266	266	0	73.5	73.5	12,223	0	12,223	-	-	-	-	-	12,223	71	195	68	55	2,886	5,356	8,241
20 to 25	22.5	100	51	72	223	223	0	73.5	73.5	11,362	0	11,362	-	-	-	-	-	11,362	52	171	68	55	2,356	5,564	7,921
15 to 20	17.5	58	29	25	112	112	0	73.5	73.5	6,266	0	6,266	-	-	-	-	-	6,266	28	84	68	55	1,420	3,145	4,566
10 to 15	12.5	10	5	6	21	21	0	73.5	73.5	1,280	0	1,280	-	-	-	-	-	1,280	5	16	68	55	277	680	957
5 to 10	7.5	8	-	1	9	9	0	73.5	73.5	594	0	594	-	-	-	-	-	594	1	8	68	55	49	389	438
0 to 5	2.5	-	-	-	-	-	-	73.5	73.5	-	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-
-5 to 0	(2.5)	-	-	-	-	-	-	73.5	73.5	-	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-
-10 to -5	(7.5)	-	-	-	-	-	-	73.5	73.5	-	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-
-15 to -10	(12.5)	-	-	-	-	-	-	73.5	73.5	-	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-
Total		1,397	1,283	1,336	4,016	4,016	0			136,405	0	136,405			-	-	-	**136,405**	1,160	2,856			31,385	46,457	**77,842**

Exhibit D-5: Engineered Cost Avoidance Calculations

Floral Park-Bellerose UFSD
Exhibit D-5-3
ECM 3 - Building Management System Upgrades

FLORAL PARK 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	85.0	-	-	-	-	-	-	-	-	-	-	-	76.0	85.0	-	-	-
95 to 100	97.5	-	3	-	3	3	-	74.0	85.0	71	-	71	-	-	-	-	-	71	2	1	76.0	85.0	46	11	57
90 to 95	92.5	-	18	3	21	21	0	74.0	85.0	388	0	388	-	-	-	-	-	388	13	8	76.0	85.0	221	57	278
85 to 90	87.5	-	100	18	118	118	0	74.0	85.0	1,593	0	1,593	-	-	-	-	-	1,593	75	43	76.0	85.0	858	108	967
80 to 85	82.5	37	292	126	455	455	0	74.0	85.0	3,867	-	3,867	-	-	-	-	-	3,867	238	217	76.0	85.0	1,545	-	1,545
75 to 80	77.5	189	289	247	725	725	0	74.0	85.0	2,537	-	2,537	-	-	-	-	-	2,537	284	441	76.0	85.0	426	-	426
70 to 75	72.5	275	200	270	745	745	0	74.0	85.0	-	-	-	-	-	-	-	-	-	240	505	76.0	85.0	-	-	-
65 to 70	67.5	236	184	245	665	665	0	74.0	85.0	-	-	-	-	-	-	-	-	-	217	448	76.0	85.0	-	-	-
60 to 65	62.5	232	158	196	586	586	0	74.0	85.0	-	-	-	-	-	-	-	-	-	189	397	76.0	85.0	-	-	-
Total		969	1,244	1,105	3,318	3,318	0			8,457	0	8,457			-	-	-	**8,457**	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	283	0	72.0	72.0	4,103	0	4,104	-	-	-	-	-	4,104	119	164	68	55	1,245	-	1,245
50 to 55	52.5	110	178	125	413	413	0	72.0	72.0	8,053	0	8,054	-	-	-	-	-	8,054	169	244	68	55	2,621	610	3,231
45 to 50	47.5	108	164	121	393	393	0	72.0	72.0	9,628	0	9,629	-	-	-	-	-	9,629	158	235	68	55	3,240	1,762	5,002
40 to 45	42.5	240	251	280	771	771	0	72.0	72.0	22,744	0	22,745	-	-	-	-	-	22,745	272	499	68	55	6,940	6,236	13,175
35 to 40	37.5	355	282	362	999	999	0	72.0	72.0	34,465	0	34,466	-	-	-	-	-	34,466	329	670	68	55	10,049	11,717	21,766
30 to 35	32.5	239	120	167	526	526	0	72.0	72.0	20,777	0	20,777	-	-	-	-	-	20,777	158	368	68	55	5,617	8,275	13,892
25 to 30	27.5	109	76	81	266	266	0	72.0	72.0	11,837	0	11,837	-	-	-	-	-	11,837	88	178	68	55	3,573	4,889	8,462
20 to 25	22.5	100	51	72	223	223	0	72.0	72.0	11,038	0	11,039	-	-	-	-	-	11,039	67	156	68	55	3,055	5,065	8,120
15 to 20	17.5	58	29	25	112	112	0	72.0	72.0	6,104	0	6,104	-	-	-	-	-	6,104	36	76	68	55	1,795	2,867	4,662
10 to 15	12.5	10	5	6	21	21	0	72.0	72.0	1,249	0	1,250	-	-	-	-	-	1,250	6	15	68	55	357	619	976
5 to 10	7.5	8	-	1	9	9	0	72.0	72.0	580	0	581	-	-	-	-	-	581	2	7	68	55	97	351	448
0 to 5	2.5	-	-	-	-	-	-	72.0	72.0	-	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-
-5 to 0	(2.5)	-	-	-	-	-	-	72.0	72.0	-	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-
-10 to -5	(7.5)	-	-	-	-	-	-	72.0	72.0	-	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-
-15 to -10	(12.5)	-	-	-	-	-	-	72.0	72.0	-	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-
Total		1,397	1,283	1,336	4,016	4,016	0			130,582	0	130,582			-	-	-	**130,582**	1,404	2,612			38,587	42,392	**80,979**

Exhibit D-5: Engineered Cost Avoidance Calculations

Floral Park-Bellerose UFSD
Exhibit D-5-3
ECM 3 - Building Management System Upgrades

JOHN LEWIS CHILDS 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	85.0	-	-	-	-	-	-	-	-	-	-	-	76.0	85.0	-	-	-
95 to 100	97.5	-	3	-	3	3	-	74.0	85.0	71	-	71	-	-	-	-	-	71	2	1	76.0	85.0	46	11	57
90 to 95	92.5	-	18	3	21	21	0	74.0	85.0	388	0	388	-	-	-	-	-	388	13	8	76.0	85.0	221	57	278
85 to 90	87.5	-	100	18	118	118	0	74.0	85.0	1,593	0	1,593	-	-	-	-	-	1,593	75	43	76.0	85.0	858	108	967
80 to 85	82.5	37	292	126	455	455	0	74.0	85.0	3,867	-	3,867	-	-	-	-	-	3,867	238	217	76.0	85.0	1,545	-	1,545
75 to 80	77.5	189	289	247	725	725	0	74.0	85.0	2,537	-	2,537	-	-	-	-	-	2,537	284	441	76.0	85.0	426	-	426
70 to 75	72.5	275	200	270	745	745	0	74.0	85.0	-	-	-	-	-	-	-	-	-	240	505	76.0	85.0	-	-	-
65 to 70	67.5	236	184	245	665	665	0	74.0	85.0	-	-	-	-	-	-	-	-	-	217	448	76.0	85.0	-	-	-
60 to 65	62.5	232	158	196	586	586	0	74.0	85.0	-	-	-	-	-	-	-	-	-	189	397	76.0	85.0	-	-	-
Total		969	1,244	1,105	3,318	3,318	0			8,457	0	8,457			-	-	-	**8,457**	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	283	0	72.0	72.0	4,103	0	4,104	-	-	-	-	-	4,104	119	164	68	55	1,245	-	1,245
50 to 55	52.5	110	178	125	413	413	0	72.0	72.0	8,053	0	8,054	-	-	-	-	-	8,054	169	244	68	55	2,621	610	3,231
45 to 50	47.5	108	164	121	393	393	0	72.0	72.0	9,628	0	9,629	-	-	-	-	-	9,629	158	235	68	55	3,240	1,762	5,002
40 to 45	42.5	240	251	280	771	771	0	72.0	72.0	22,744	0	22,745	-	-	-	-	-	22,745	272	499	68	55	6,940	6,236	13,175
35 to 40	37.5	355	282	362	999	999	0	72.0	72.0	34,465	0	34,466	-	-	-	-	-	34,466	329	670	68	55	10,049	11,717	21,766
30 to 35	32.5	239	120	167	526	526	0	72.0	72.0	20,777	0	20,777	-	-	-	-	-	20,777	158	368	68	55	5,617	8,275	13,892
25 to 30	27.5	109	76	81	266	266	0	72.0	72.0	11,837	0	11,837	-	-	-	-	-	11,837	88	178	68	55	3,573	4,889	8,462
20 to 25	22.5	100	51	72	223	223	0	72.0	72.0	11,038	0	11,039	-	-	-	-	-	11,039	67	156	68	55	3,055	5,065	8,120
15 to 20	17.5	58	29	25	112	112	0	72.0	72.0	6,104	0	6,104	-	-	-	-	-	6,104	36	76	68	55	1,795	2,867	4,662
10 to 15	12.5	10	5	6	21	21	0	72.0	72.0	1,249	0	1,250	-	-	-	-	-	1,250	6	15	68	55	357	619	976
5 to 10	7.5	8	-	1	9	9	0	72.0	72.0	580	0	581	-	-	-	-	-	581	2	7	68	55	97	351	448
0 to 5	2.5	-	-	-	-	-	-	72.0	72.0	-	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-
-5 to 0	(2.5)	-	-	-	-	-	-	72.0	72.0	-	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-
-10 to -5	(7.5)	-	-	-	-	-	-	72.0	72.0	-	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-
-15 to -10	(12.5)	-	-	-	-	-	-	72.0	72.0	-	-	-	-	-	-	-	-	-	-	-	68	55	-	-	-
Total		1,397	1,283	1,336	4,016	4,016	0			130,582	0	130,582			-	-	-	**130,582**	1,404	2,612			38,587	42,392	**80,979**

Floral Park-Bellerose UFSD
Exhibit D-5-3
ECM 3 - Building Management System Upgrades

SAVINGS SUMMARY

Building ID	kWh Savings	Thermal Savings	Thermal Safety Factor	Electric Safety Factor
	kWh	Therms	%	%
Administration Building	2,163	952	0.0%	0.0%
Floral Park Elementary School	21,317	24,109	0.0%	0.0%
John Lewis Childs School	18,242	8,249	1.8%	0.0%
Subtotal	41,721	33,310		

Floral Park-Bellerose UFSD
Exhibit D-5-3
ECM 3 - Building Management System Upgrades
Plug Load Controls - Summary

CALCULATION SUMMARY

	Administration Building	Floral Park Elementary School	John Lewis Childs School
Include BERT Savings	Y	Y	Y
# of BERTS	17	181	132
BERT Savings [kWh]	1,798	10,858	9,133
Electric Safety Factor [%]	0%	0%	0%
Total Electric Savings [kWh]	1,798	10,858	9,133

SAVINGS SUMMARY

Building ID	kWh Savings	Electric Safety Factor
	kWh	%
Administration Building	1,798	0.0%
Floral Park Elementary School	10,858	0.0%
John Lewis Childs School	9,133	0.0%
Subtotal	21,789	

Floral Park-Bellerose UFSD
Exhibit D-5-3
ECM 3 - Building Management System Upgrades
Plug Load Controls

Administration Building

Equipment	Number of Berts	Total Number of Devices	Typical Use, Hours / Week	Off Time Hours (Weekdays)	Off Time Hours (Weekends)	Parasitic Load Watts	Months / Year	Monthly kWh w/ Out Bert	Yearly kWh w/ Out Bert	Monthly kWh With Bert	Yearly kWh With Bert	Annual kWh Savings
Projector		-	168	16	24	8	12	-	-	-	-	-
Smartboard	1	1	168	16	24	6	12	4	52	1	12	40
Large Printer/Copier (110V)	2	2	168	16	24	45	12	66	786	16	187	599
Water Fountain or H/C Water Dispenser	1	1	168	16	24	62	12	45	542	11	129	413
Charging Cart		-	168	16	24	35	12	-	-	-	-	-
Medium Printer	4	4	168	16	24	10	12	29	349	7	83	266
Window AC Units		-	168	16	24		12	-	-	-	-	-
Snack Machine			168	16	24	40						
Cold Drink			168	16	24	320						
TV		-	168	16	24	8	12	-	-	-	-	-
								-	-	-	-	-
SUB TOTAL	**8**	**8**						**144**	**1,730**	**34**	**412**	**1,318**

Floral Park Elementary School

Equipment	Number of Berts	Total Number of Devices	Typical Use, Hours / Week	Off Time Hours (Weekdays)	Off Time Hours (Weekends)	Parasitic Load Watts	Months / Year	Monthly kWh w/ Out Bert	Yearly kWh w/ Out Bert	Monthly kWh With Bert	Yearly kWh With Bert	Annual kWh Savings
Projector	24	24	168	16	24	8	12	140	1,677	33	399	1,278
Smartboard	35	35	168	16	24	6	12	153	1,835	36	437	1,398
Large Printer/Copier (110V)	4	4	168	16	24	45	12	131	1,572	31	374	1,198
Water Fountain or H/C Water Dispenser		-	168	16	24	62	12	-	-	-	-	-
Charging Cart		-	168	16	24	35	12	-	-	-	-	-
Medium Printer	60	60	168	16	24	10	12	437	5,242	104	1,248	3,994
Window AC Units		-	168	16	24	-	12	-	-	-	-	-
Snack Machine		-	168	16	24	40		-		-		
Cold Drink		-	168	16	24	320		-		-		
TV		-	168	16	24	8	12	-	-	-	-	-
0							12	-	-	-	-	-
SUB TOTAL	**123**	**123**						**860**	**10,326**	**205**	**2,459**	**7,867**

Floral Park-Bellerose UFSD
Exhibit D-5-3
ECM 3 - Building Management System Upgrades
Plug Load Controls

John Lewis Childs School

Equipment	Number of Berts	Total Number of Devices	Typical Use, Hours / Week	Off Time Hours (Weekdays)	Off Time Hours (Weekends)	Parasitic Load Watts	Months / Year	Monthly kWh w/ Out Bert	Yearly kWh w/ Out Bert	Monthly kWh With Bert	Yearly kWh With Bert	Annual kWh Savings
Projector	25	25	168	16	24	8	12	146	1,747	35	416	1,331
Smartboard	12	12	168	16	24	6	12	52	629	12	150	479
Large Printer/Copier (110V)	5	5	168	16	24	45	12	164	1,966	39	468	1,498
Water Fountain or H/C Water Dispenser		-	168	16	24	62	12	-	-	-	-	-
Charging Cart	3	3	168	16	24	35	12	76	917	18	218	699
Medium Printer	46	46	168	16	24	10	12	335	4,019	80	957	3,062
Window AC Units		-	168	16	24	-	12	-	-	-	-	-
Snack Machine		-	168	16	24	40						
Cold Drink	1	1	168	16	24	320						
TV	1	1	168	16	24	8	12	6	70	1	17	53
SUB TOTAL	**93**	**93**						**779**	**9,348**	**185**	**2,226**	**7,122**

Floral Park-Bellerose UFSD
Exhibit D-5 Chart
Window AC Unit Controls Chart

EXISTING							
Building	Equipment Label	Qty	Controls (Y/N)	Manufacturer	Area Served	Total Capacity [Tons]	Existing EER
Floral Park Elementary School		58	Y	Various	Various	87.0	8.0
John Lewis Childs School		39	Y	Various	Various	58.5	8.0
Administration Building		9	Y	Various	Various	13.5	8.0
Totals		106				159.0	

PROPOSED			
Manufacturer	Qty	Total Capacity [Tons]	Proposed EER
Various	58	87.0	8.0
Various	39	58.5	8.0
Various	9	13.5	8.0
	106	159.0	

EXISTING WINDOW AC UNIT SPECIFICATIONS

Building	Floral Park Elementary School	John Lewis Childs School	Administration Building
Label	0	0	0
Area Serving	Various	Various	Various
Quantity	58	39	9
Total Capacity [Tons]	87.0	58.5	13.5
Existing EER	8.0	8.0	8.0

PROPOSED WINDOW AC UNIT SPECIFICATIONS

	Floral Park Elementary School	John Lewis Childs School	Administration Building
Window AC Unit Controls	Y	Y	Y
Label	0	0	0
Area Serving	Various	Various	Various
Quantity	58	39	9
Total Capacity [Tons]	87.0	58.5	13.5
Proposed EER	8.0	8.0	8.0

Floral Park-Bellerose UFSD
Exhibit D-5-3
ECM 3 - Building Management System Upgrades
Plug Load Controls - Window A/C Units

ECM DESCRIPTION

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

DATA / ASSUMPTIONS

*Run Hours based on occupancy schedule
*Full Load is estimated at (unless stated otherwise) : **92.5** °F

COMMISSIONING

Ensure controls have been properly installed and scheduled

RECOVERY/SAFETY FACTOR

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

FORMULAE

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

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

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

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

Floral Park-Bellerose UFSD
Exhibit D-5-3
ECM 3 - Building Management System Upgrades
Plug Load Controls - Window A/C Units

* Inputs are in blue

Building	Label	Total Tonnage	Current EER	Proposed EER	Area Serving
Floral Park Elementary School	0	87.0	8.0	8.0	Various
John Lewis Childs School	0	58.5	8.0	8.0	Various
Administration Building	0	13.5	8.0	8.0	Various
Totals		**159.0**			

CALCULATIONS

	Floral Park Elementary School	John Lewis Childs School	Administration Building
Label	-	-	-
Area Serving	Various	Various	Various
Window AC Unit Capacity [Tons]	87.0	58.5	13.5
Existing EER	8.0	8.0	8.0
Proposed EER	8.0	8.0	8.0
Proposed Occupied Cooling Setpoint [°F]	76.0	76.0	76.0
Proposed Unoccupied Cooling Setpoint [°F]	85.0	85.0	85.0
Existing Window AC Unit Consumption [kWh]	27,399	18,423	4,052
% of Baseline Consumption [%]	7.6%	6.7%	17.6%
Proposed Window AC Unit Consumption [kWh]	24,408	16,412	3,572
Electric Savings [kWh]	2,991	2,011	480
Electric Safety Factor [%]	0%	0%	0%
Electric Savings [kWh]	2,991	2,011	480

FLORAL PARK 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	Existing Window AC Unit Consumption [kWh]	Proposed Window AC Unit Consumption [kWh]	Electrical Savings [kWh]
COOLING														
100 to 105	102.5	-	-	-	-	-	-	87.0	87.0	-	-	-	-	-
95 to 100	97.5	-	3	-	3	2	1	87.0	87.0	186	75	392	280	112
90 to 95	92.5	-	18	3	21	13	8	87.0	87.0	1,165	662	2,741	1,748	993
85 to 90	87.5	-	100	18	118	75	43	60.6	29.0	4,526	1,257	8,675	6,789	1,886
80 to 85	82.5	37	292	126	455	238	217	34.3	-	8,146	-	12,219	12,219	-
75 to 80	77.5	189	289	247	725	284	441	7.9	-	2,248	-	3,373	3,373	-
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	363.8	290.0	16,272	1,994	27,399	24,408	2,991

Floral Park-Bellerose UFSD
Exhibit D-5-3
ECM 3 - Building Management System Upgrades
Plug Load Controls - Window A/C Units

JOHN LEWIS CHILDS 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	Existing Window AC Unit Consumption [kWh]	Proposed Window AC Unit Consumption [kWh]	Electrical Savings [kWh]
COOLING														
100 to 105	102.5	-	-	-	-	-	-	58.5	58.5	-	-	-	-	-
95 to 100	97.5	-	3	-	3	2	1	58.5	58.5	125	50	263	188	75
90 to 95	92.5	-	18	3	21	13	8	58.5	58.5	783	445	1,843	1,175	668
85 to 90	87.5	-	100	18	118	75	43	40.8	19.5	3,043	845	5,833	4,565	1,268
80 to 85	82.5	37	292	126	455	238	217	23.0	-	5,477	-	8,216	8,216	-
75 to 80	77.5	189	289	247	725	284	441	5.3	-	1,512	-	2,268	2,268	-
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	244.6	195.0	10,942	1,341	18,423	16,412	2,011

ADMINISTRATION BUILDING

Amb. Temp Bin [°F]	Avg Temp [°F]	01-08 Hours	09-16 Hours	17-24 Hours	Total Bin Hours	Occup.Bin Hours	Unocc. Bin Hours	Occupied Tons	Unoccupied Tons	Occupied Ton-Hrs	Unoccupied Ton-Hrs	Existing Window AC Unit Consumption [kWh]	Proposed Window AC Unit Consumption [kWh]	Electrical Savings [kWh]
COOLING														
100 to 105	102.5	-	-	-	-	-	-	13.5	13.5	-	-	-	-	-
95 to 100	97.5	-	3	-	3	2	1	13.5	13.5	29	12	61	43	17
90 to 95	92.5	-	18	3	21	13	8	13.5	13.5	177	106	425	266	159
85 to 90	87.5	-	100	18	118	73	45	9.4	4.5	687	202	1,334	1,031	304
80 to 85	82.5	37	292	126	455	223	232	5.3	-	1,187	-	1,780	1,780	-
75 to 80	77.5	189	289	247	725	245	480	1.2	-	301	-	452	452	-
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	151	435	-	-	-	-	-	-	-
Total		969	1,244	1,105	3,318	1,074	2,244	56.5	45.0	2,381	320	4,052	3,572	480

Floral Park-Bellerose UFSD
Exhibit D-5-3
ECM 3 - Building Management System Upgrades
Plug Load Controls - Window A/C Units

SAVINGS SUMMARY

Building ID	kWh Savings	kW Savings	Electric Safety Factor
	kWh	kW	%
Administration Building	480	-	0.0%
Floral Park Elementary School	2,991	-	0.0%
John Lewis Childs School	2,011	-	0.0%
Subtotal	5,482	-	

Floral Park-Bellerose UFSD
Exhibit D-5-4
ECM 4 - Install Pipe Insulation
Piping Insulation - Summary

CALCULATION SUMMARY

	Administration Building	Floral Park Elementary School	John Lewis Childs School
Include Heating Hot Water Pipe Insulation Savings		Y	
Heating Hot Water Pipe Insulation Savings [Therms]	-	-	-
Include Domestic Hot Water Pipe Insulation Savings		Y	
Domestic Hot Water Pipe Insulation Savings [Therms]	-	-	-
Include Steam Pipe Insulation Savings		Y	
Steam Pipe Insulation Savings [Therms]	-	743	-
Include Condensate Pip Insulation Savings		Y	
Condensate Pipe Instulation Savings [Therms]	-	-	-
Safety Factor [%]	0%	0%	0%
Total Thermal Savings [Therms]	-	743	-

SAVINGS SUMMARY

Building ID	Thermal Savings	Thermal Safety Factor
	Therms	%
Administration Building	-	0.0%
Floral Park Elementary School	743	0.0%
John Lewis Childs School	-	0.0%
Subtotal	743	

Floral Park-Bellerose UFSD
Exhibit D-5-4
ECM 4 - Install Pipe Insulation
Steam Piping Insulation

ECM DESCRIPTION

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

DATA / ASSUMPTIONS

Run Hours	4,016	
* New Pipe Insulation Thermal Conductivity (k-Factor)	**0.27**	BTU/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

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

Convection Analysis

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

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

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

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

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

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

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

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

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

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

Floral Park-Bellerose UFSD
Exhibit D-5-4
ECM 4 - Install Pipe Insulation
Steam Piping Insulation

Variable	Units	Description
T_{SAVE}	Therms	Total thermal savings
$q_{CONV-INS}$	BTU/hr	Convective heat loss from insulated pipe
$q_{CONV-BARE}$	BTU/hr	Convective heat loss from bare pipe
h_{C-INS}	BTU/hr·ft^2·°F	Natural convective insulated pipe heat transfer film coefficient
h_{C-BARE}	BTU/hr·ft^2·°F	Natural convective bare pipe heat transfer film coefficient
$T_{FILM-INS}$	°F	Average film temperature of insulated pipe
$T_{FILM-BARE}$	°F	Average film temperature of bare pipe
k	BTU/hr·ft·°F	Thermal conductivity of pipe insulation
q_{ITER}	BTU/hr	Iterative heat loss
h_{ITER}	BTU/hr·ft^2·°F	Iterative natural convection heat transfer film coefficient
h_{INT}	BTU/hr·ft^2·°F	Initial natural convection heat transfer film coefficient (for iterations)
t	hr	Duration of the heating season
$q_{RAD-INS}$	BTU/hr	Net radiation heat loss from insulated pipe
$q_{RAD-BARE}$	BTU/hr	Net radiation heat loss from bare pipe
σ	BTU/hr·ft^2·°R^4	Stefan-Boltzman constant (0.1713 x 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

Floral Park-Bellerose UFSD
Exhibit D-5-4
ECM 4 - Install Pipe Insulation
Steam Piping Insulation

CALCULATIONS

* Inputs are in blue

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

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

Building	14"+ Diameter	10" Diameter	8" Diameter	6" Diameter	5" Diameter	4" Diameter	3" Diameter	2.5" Diameter	2" Diameter	1.5" Diameter	1" Diameter	0.75" Diameter	0.5" Diameter
Administration Building													
Floral Park Elementary School							57.9		15.5				
John Lewis Childs School													
Totals	-	-	-	-	-	-	**57.9**	-	**15.5**	-	-	-	-
	-	-	-	-	-	-	45.46	-	8.09	-	-	-	-

	Administration Building	Floral Park Elementary School	John Lewis Childs School
Total Linear Feet of Insulation [ft]	-	73.4	-
Losses from Bare Pipe [BTU/hr]	-	25,023	-
Losses from Insulated Pipe [BTU/hr]	-	10,839	-
Proposed Boiler Efficiency [%]	80.3%	76.7%	77.1%
Thermal Savings [Therms/hr]	-	0.18	-
Safety Factor [%]	0%	0%	0%
Thermal Savings [Therms]	-	743	-

Floral Park-Bellerose UFSD
Exhibit D-5-4
ECM 4 - Install Pipe Insulation
Steam Piping Insulation

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

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

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

Floral Park-Bellerose UFSD
Exhibit D-5-4
ECM 4 - Install Pipe Insulation
Steam Piping Insulation

INSULATION SURFACE TEMP. CALCULATION 10.0 inch pipe			
		1st Iteration Heat Loss [BTU/hr]	375
		1st Iteration Insulation Surface Temp. [°F]	122
		1st Iteration Film Coefficient [BTU/hr·ft²·°F]	0.667
		2nd Iteration Heat Loss [BTU/hr]	249
NPS Pipe Size [in]	10.00	2nd Iteration Insulation Surface Temp. [°F]	155
Bare Pipe Surface Temp. [°F]	220	2nd Iteration Film Coefficient [BTU/hr·ft²·°F]	0.754
Initial Film Coefficient [BTU/hr·ft²·°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	266
Insulation Thickness [in]	3.0	3rd Iteration Insulation Surface Temp. [°F]	150
Insulation k-Factor [BTU/hr·ft²·°F]	0.270	3rd Iteration Film Coefficient [BTU/hr·ft²·°F]	0.744
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	264
External Pipe Diameter [in]	10.75	4th Iteration Insulation Surface Temp. [°F]	151
Insulation Surface Temp [°F]	**151**	4th Iteration Film Coefficient [BTU/hr·ft²·°F]	0.745

INSULATION SURFACE TEMP. CALCULATION 2.0 inch pipe			
		1st Iteration Heat Loss [BTU/hr]	147
		1st Iteration Insulation Surface Temp. [°F]	111
		1st Iteration Film Coefficient [BTU/hr·ft²·°F]	0.746
		2nd Iteration Heat Loss [BTU/hr]	111
NPS Pipe Size [in]	2.00	2nd Iteration Insulation Surface Temp. [°F]	138
Bare Pipe Surface Temp. [°F]	220	2nd Iteration Film Coefficient [BTU/hr·ft²·°F]	0.847
Initial Film Coefficient [BTU/hr·ft²·°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	117
Insulation Thickness [in]	3.0	3rd Iteration Insulation Surface Temp. [°F]	133
Insulation k-Factor [BTU/hr·ft²·°F]	0.270	3rd Iteration Film Coefficient [BTU/hr·ft²·°F]	0.832
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	116
External Pipe Diameter [in]	2.375	4th Iteration Insulation Surface Temp. [°F]	134
Insulation Surface Temp [°F]	**134**	4th Iteration Film Coefficient [BTU/hr·ft²·°F]	0.834

INSULATION SURFACE TEMP. CALCULATION 8.0 inch pipe			
		1st Iteration Heat Loss [BTU/hr]	320
		1st Iteration Insulation Surface Temp. [°F]	121
		1st Iteration Film Coefficient [BTU/hr·ft²·°F]	0.685
		2nd Iteration Heat Loss [BTU/hr]	217
NPS Pipe Size [in]	8.00	2nd Iteration Insulation Surface Temp. [°F]	153
Bare Pipe Surface Temp. [°F]	220	2nd Iteration Film Coefficient [BTU/hr·ft²·°F]	0.775
Initial Film Coefficient [BTU/hr·ft²·°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	231
Insulation Thickness [in]	3.0	3rd Iteration Insulation Surface Temp. [°F]	148
Insulation k-Factor [BTU/hr·ft²·°F]	0.270	3rd Iteration Film Coefficient [BTU/hr·ft²·°F]	0.764
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	230
External Pipe Diameter [in]	8.625	4th Iteration Insulation Surface Temp. [°F]	149
Insulation Surface Temp [°F]	**149**	4th Iteration Film Coefficient [BTU/hr·ft²·°F]	0.765

INSULATION SURFACE TEMP. CALCULATION 1.5 inch pipe			
		1st Iteration Heat Loss [BTU/hr]	146
		1st Iteration Insulation Surface Temp. [°F]	139
		1st Iteration Film Coefficient [BTU/hr·ft²·°F]	0.973
		2nd Iteration Heat Loss [BTU/hr]	110
NPS Pipe Size [in]	1.50	2nd Iteration Insulation Surface Temp. [°F]	158
Bare Pipe Surface Temp. [°F]	220	2nd Iteration Film Coefficient [BTU/hr·ft²·°F]	1.036
Initial Film Coefficient [BTU/hr·ft²·°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	114
Insulation Thickness [in]	1.5	3rd Iteration Insulation Surface Temp. [°F]	156
Insulation k-Factor [BTU/hr·ft²·°F]	0.270	3rd Iteration Film Coefficient [BTU/hr·ft²·°F]	1.029
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	114
External Pipe Diameter [in]	1.9	4th Iteration Insulation Surface Temp. [°F]	156
Insulation Surface Temp [°F]	**156**	4th Iteration Film Coefficient [BTU/hr·ft²·°F]	1.030

INSULATION SURFACE TEMP. CALCULATION 6.0 inch pipe			
		1st Iteration Heat Loss [BTU/hr]	266
		1st Iteration Insulation Surface Temp. [°F]	119
		1st Iteration Film Coefficient [BTU/hr·ft²·°F]	0.705
		2nd Iteration Heat Loss [BTU/hr]	185
NPS Pipe Size [in]	6.00	2nd Iteration Insulation Surface Temp. [°F]	150
Bare Pipe Surface Temp. [°F]	220	2nd Iteration Film Coefficient [BTU/hr·ft²·°F]	0.796
Initial Film Coefficient [BTU/hr·ft²·°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	197
Insulation Thickness [in]	3.0	3rd Iteration Insulation Surface Temp. [°F]	145
Insulation k-Factor [BTU/hr·ft²·°F]	0.270	3rd Iteration Film Coefficient [BTU/hr·ft²·°F]	0.785
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	196
External Pipe Diameter [in]	6.625	4th Iteration Insulation Surface Temp. [°F]	146
Insulation Surface Temp [°F]	**146**	4th Iteration Film Coefficient [BTU/hr·ft²·°F]	0.786

INSULATION SURFACE TEMP. CALCULATION 1.0 inch pipe			
		1st Iteration Heat Loss [BTU/hr]	121
		1st Iteration Insulation Surface Temp. [°F]	135
		1st Iteration Film Coefficient [BTU/hr·ft²·°F]	0.990
		2nd Iteration Heat Loss [BTU/hr]	94
NPS Pipe Size [in]	1.00	2nd Iteration Insulation Surface Temp. [°F]	154
Bare Pipe Surface Temp. [°F]	220	2nd Iteration Film Coefficient [BTU/hr·ft²·°F]	1.056
Initial Film Coefficient [BTU/hr·ft²·°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	98
Insulation Thickness [in]	1.5	3rd Iteration Insulation Surface Temp. [°F]	152
Insulation k-Factor [BTU/hr·ft²·°F]	0.270	3rd Iteration Film Coefficient [BTU/hr·ft²·°F]	1.048
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	97
External Pipe Diameter [in]	1.315	4th Iteration Insulation Surface Temp. [°F]	152
Insulation Surface Temp [°F]	**152**	4th Iteration Film Coefficient [BTU/hr·ft²·°F]	1.049

Floral Park-Bellerose UFSD
Exhibit D-5-4
ECM 4 - Install Pipe Insulation
Steam Piping Insulation

INSULATION SURFACE TEMP. CALCULATION 5.0 inch pipe			
		1st Iteration Heat Loss [BTU/hr]	238
		1st Iteration Insulation Surface Temp. [°F]	118
		1st Iteration Film Coefficient [BTU/hr·ft²·°F]	0.716
		2nd Iteration Heat Loss [BTU/hr]	168
NPS Pipe Size [in]	5.00	2nd Iteration Insulation Surface Temp. [°F]	148
Bare Pipe Surface Temp. [°F]	220	2nd Iteration Film Coefficient [BTU/hr·ft²·°F]	0.809
Initial Film Coefficient [BTU/hr·ft²·°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	179
Insulation Thickness [in]	3.0	3rd Iteration Insulation Surface Temp. [°F]	143
Insulation k-Factor [BTU/hr·ft²·°F]	0.270	3rd Iteration Film Coefficient [BTU/hr·ft²·°F]	0.796
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	177
External Pipe Diameter [in]	5.563	4th Iteration Insulation Surface Temp. [°F]	144
Insulation Surface Temp [°F]	**144**	4th Iteration Film Coefficient [BTU/hr·ft²·°F]	0.798

INSULATION SURFACE TEMP. CALCULATION 4.0 inch pipe			
		1st Iteration Heat Loss [BTU/hr]	208
		1st Iteration Insulation Surface Temp. [°F]	116
		1st Iteration Film Coefficient [BTU/hr·ft²·°F]	0.727
		2nd Iteration Heat Loss [BTU/hr]	150
NPS Pipe Size [in]	4.00	2nd Iteration Insulation Surface Temp. [°F]	145
Bare Pipe Surface Temp. [°F]	220	2nd Iteration Film Coefficient [BTU/hr·ft²·°F]	0.822
Initial Film Coefficient [BTU/hr·ft²·°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	159
Insulation Thickness [in]	3.0	3rd Iteration Insulation Surface Temp. [°F]	140
Insulation k-Factor [BTU/hr·ft²·°F]	0.270	3rd Iteration Film Coefficient [BTU/hr·ft²·°F]	0.809
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	158
External Pipe Diameter [in]	4.5	4th Iteration Insulation Surface Temp. [°F]	141
Insulation Surface Temp [°F]	**141**	4th Iteration Film Coefficient [BTU/hr·ft²·°F]	0.811

INSULATION SURFACE TEMP. CALCULATION 3.0 inch pipe			
		1st Iteration Heat Loss [BTU/hr]	180
		1st Iteration Insulation Surface Temp. [°F]	114
		1st Iteration Film Coefficient [BTU/hr·ft²·°F]	0.737
		2nd Iteration Heat Loss [BTU/hr]	132
NPS Pipe Size [in]	3.00	2nd Iteration Insulation Surface Temp. [°F]	142
Bare Pipe Surface Temp. [°F]	220	2nd Iteration Film Coefficient [BTU/hr·ft²·°F]	0.834
Initial Film Coefficient [BTU/hr·ft²·°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	140
Insulation Thickness [in]	3.0	3rd Iteration Insulation Surface Temp. [°F]	138
Insulation k-Factor [BTU/hr·ft²·°F]	0.270	3rd Iteration Film Coefficient [BTU/hr·ft²·°F]	0.821
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	139
External Pipe Diameter [in]	3.5	4th Iteration Insulation Surface Temp. [°F]	138
Insulation Surface Temp [°F]	**138**	4th Iteration Film Coefficient [BTU/hr·ft²·°F]	0.822

INSULATION SURFACE TEMP. CALCULATION 0.75 inch pipe			
		1st Iteration Heat Loss [BTU/hr]	110
		1st Iteration Insulation Surface Temp. [°F]	133
		1st Iteration Film Coefficient [BTU/hr·ft²·°F]	0.997
		2nd Iteration Heat Loss [BTU/hr]	86
NPS Pipe Size [in]	0.75	2nd Iteration Insulation Surface Temp. [°F]	151
Bare Pipe Surface Temp. [°F]	220	2nd Iteration Film Coefficient [BTU/hr·ft²·°F]	1.064
Initial Film Coefficient [BTU/hr·ft²·°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	89
Insulation Thickness [in]	1.5	3rd Iteration Insulation Surface Temp. [°F]	149
Insulation k-Factor [BTU/hr·ft²·°F]	0.270	3rd Iteration Film Coefficient [BTU/hr·ft²·°F]	1.056
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	89
External Pipe Diameter [in]	1.05	4th Iteration Insulation Surface Temp. [°F]	149
Insulation Surface Temp [°F]	**149**	4th Iteration Film Coefficient [BTU/hr·ft²·°F]	1.057

INSULATION SURFACE TEMP. CALCULATION 0.5 inch pipe			
		1st Iteration Heat Loss [BTU/hr]	**100**
		1st Iteration Insulation Surface Temp. [°F]	**130**
		1st Iteration Film Coefficient [BTU/hr·ft²·°F]	**1.001**
		2nd Iteration Heat Loss [BTU/hr]	**79**
NPS Pipe Size [in]	0.50	2nd Iteration Insulation Surface Temp. [°F]	**149**
Bare Pipe Surface Temp. [°F]	220	2nd Iteration Film Coefficient [BTU/hr·ft²·°F]	**1.070**
Initial Film Coefficient [BTU/hr·ft²·°F]	1.65	3rd Iteration Heat Loss [BTU/hr]	**82**
Insulation Thickness [in]	1.5	3rd Iteration Insulation Surface Temp. [°F]	**146**
Insulation k-Factor [BTU/hr·ft²·°F]	0.270	3rd Iteration Film Coefficient [BTU/hr·ft²·°F]	**1.061**
Environment Temp. [°F]	70	4th Iteration Heat Loss [BTU/hr]	**82**
External Pipe Diameter [in]	0.84	4th Iteration Insulation Surface Temp. [°F]	**147**
Insulation Surface Temp [°F]	**147**	4th Iteration Film Coefficient [BTU/hr·ft²·°F]	**1.062**

SAVINGS SUMMARY

Building ID	Thermal Savings	Safety Factor
	Therms	%
Administration Building	-	0.0%
Floral Park Elementary School	743	0.0%
John Lewis Childs School	-	0.0%
Subtotal	743	

Floral Park-Bellerose UFSD
Exhibit D-5-5
ECM 5 - Steam Trap Replacement

ECM DESCRIPTION

Steam trap audit identified that there are steam traps that are not currently working or are partially working. Faulty steam traps will be either replaced or repaired.

DATA / ASSUMPTIONS

Failed Steam Traps Based on Audit [%] =	Various
Average Capacity Leakage [%] =	25%
Energy Content of Saturated Steam [BTU/lb] =	1,156
Heating Season Hours	4,016

COMMISSIONING

Verify function of all steam traps per scope of work

RECOVERY/SAFETY FACTOR

Thermal Safety Factor [%] =	Various

FORMULAE

$Q_{savings} = (q_{loss} \cdot h_g / 100{,}000) / \eta$

$q_{loss} = \sum^{TRAPS} q_{trap} \cdot st_{fail\%} \cdot t$

$q_{trap} = 51.43 \cdot L \cdot (\pi \cdot (d^2 / 4)) \cdot (p + 14.7)$

Variable	Units	Description
$Q_{savings}$	Therms	Thermal Savings
h_g	BTU / lb	Energy content of saturated steam
$\sum^{TRAPS}$	-	Summation of all steam traps
q_{loss}	lb / yr	Annual steam loss through failed office
q_{trap}	lb / hr	Steam loss through failed office
$st_{fail\%}$	%	Percentage of failed steam traps
t	hrs	Annual heating system run hours
p	psig	Pressure of steam through respective system
51.43	-	Napier formula constant
L	%	Average capacity leakage
d	inches	Orifice Diameter
η	%	Boiler Efficiency

Floral Park-Bellerose UFSD
Exhibit D-5-5
ECM 5 - Steam Trap Replacement

* Inputs are in blue

Building	% of Population Failed
Floral Park Elementary School	21%
John Lewis Childs School	18%

CALCULATIONS

Heating Season Length [Hrs]	Equipment	Steam Trap Type	Steam Pressure [psi]	Orifice Diameter [in]	Failed Trap Steam Loss [lbs/hr]	Floral Park Elementary School Qty	John Lewis Childs School Qty
4,016	Drip	F&T	5.0	0.253	12.73	2	2
4,016	Drip	F&T	5.0	0.687	93.89		
4,016	OTH	F&T	5.0	0.253	12.73	2	
4,016	Drip	F&T	5.0	0.312	19.37	1	
4,016	AHU	F&T	5.0	0.500	49.73		
4,016	AHU	T-A	5.0	0.313	19.43	3	
4,016	Drip	T-A	5.0	0.313	19.43	4	
2,200	ZRH	T-A	5.0	0.313	19.43	6	7
2,200	Drip	F&T	5.0	0.253	12.73	1	
1,000	RAD	T-A	5.0	0.313	19.43	1	
2,200	HUH	F&T	5.0	0.228	10.34	1	
4,016	Drip	T-A	5.0	0.196	7.64	2	
1,000	RAD	T-A	5.0	0.228	10.34	1	9
4,016	Drip	T-A	5.0	0.228	10.34	13	1
4,016	Drip	F&T	5.0	0.228	10.34	3	13
1,000	RAD	T-A	5.0	0.228	10.34	69	
-	RAD	TRV	5.0		-	-	-
1,200	UV	T-A	5.0	0.228	10.34	35	1
1,000	Drip	T-A	5.0	0.228	10.34	40	
2,200	VUH	F&T	5.0	0.228	10.34	4	
4,016	Drip	F&T	5.0	0.228	10.34	2	
1,200	UV	T-A	5.0	0.228	10.34		3
1,000	RAD	T-S	5.0	0.228	10.34		1
1,000	RAD	T-A	5.0	0.313	19.43		75
-	RAD	TRV	5.0		-	-	-
1,200	UV	T-A	5.0	0.313	19.43		47
4,016	Drip	T-A	5.0	0.313	19.43		20
					Total Traps	190	179
					Percent of Population Failed [%]	21%	18%
					Annual Steam Loss [lbs/yr]	761,660	944,887
					Safety Factor [%]	0%	2%
					Annual Steam Loss [Therms/yr]	8,805	10,715
					Proposed Boiler Efficency [%]	76.7%	77.1%
					Annual Heat Input Losses [Therms]	11,480	13,903

Floral Park-Bellerose UFSD
Exhibit D-5-5
ECM 5 - Steam Trap Replacement

SAVINGS SUMMARY

Building ID	Thermal Savings	Thermal Safety Factor
	Therms	%
Administration Building	-	0.0%
Floral Park Elementary School	11,480	0.0%
John Lewis Childs School	13,903	1.9%
Subtotal	25,382	

EXHIBIT D-6
OPERATIONAL COST AVOIDANCE CALCULATIONS

OSD #1: LIGHTING OPERATIONAL COST AVOIDANCE

1. **Description and Causal Connection to Scope of Work:** Attachment A, ECM 1 describes Honeywell's scope of work for implementing a comprehensive lighting retrofit throughout the District.
2. **Operational Cost Baseline:** Lighting related expenditures fall under Operations and Maintenance. The baseline is assumed and calculated to be the Mean Time Between Failures (MTBF) of the existing luminaries.
3. **Operational Cost Conservation Methodology:** The new LED lighting fixtures and retrofit kits being installed have a longer material life than the standard existing equipment. This translates into a longer Mean Time Between Failures (MTBF) thus resulting in a longer timeframe between equipment replacement periods. 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 cost reductions were calculated based on the quantity of lamps and ballasts being replaced, and the average life expectancy of the existing and proposed equipment. The estimated material savings is agreed to be $1,482/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 a new high efficiency boiler plant at John Lewis Childs School.
2. **Determination of Operational Costs Avoided:** Operational cost savings are a result of a reduction in the District's current preventive maintenance/repair dollar spend on the existing equipment. The amount of savings is agreed to be $10,000/yr.

OSD #3: BUILDING MANAGEMENT SYSTEM UPGRADE OPERATIONAL COST AVOIDANCE

1. **Description and Causal Connection to Scope of Work:** Attachment A, ECM 3 describes Honeywell's scope of work for implementing Building Management System upgrades throughout the District.
2. **Determination of Operational Costs Avoided:** Operational cost savings are based on the elimination of maintenance and repair costs on the existing pneumatic controls and air compressors, on the elimination of JACE license upgrades which were necessary every time the District's IT Department performed a District-wide PC JAVA upgrade, on the reduction of weekday/weekend OT labor due to the lack of remote monitoring capabilities, and on the reduction of annual DDC preventive maintenance costs as the new open protocol open license system allows for competitive procurement through multiple authorized dealers. The amount of savings is agreed to be $28,493/yr.

~ This Page Intentionally Left Blank ~

Exhibit D -7: Detailed M&V Plan
Floral Park-Bellerose UFSD

The Measurement and Verification (M&V) process for the Energy Conservation Measures (ECMs) described will follow the guidelines set forth in the Efficiency Valuation Organization (EVO) - IPMVP Concepts and Options for Determining Energy and Water Savings – Volume 1 - January 2012 based on Option A and C requirements for the following buildings:

Building & ECM List:

Floral Park-Bellerose UFSD, NY		ECM 1	ECM 2	ECM 3	ECM 4	ECM 5
Bldg #	Bldg Description	Lighting & Lighting Controls	Boiler Plant Upgrades	Building Management System Upgrades	Pipe Insulation	Steam Traps Replacement
1	Floral Park Elementary School	A/C/_		A/C/_	_/C/_	_/C/_
2	John Lewis Childs School	A/C/_	_/C/_	A/C/_		_/C/_
3	Administration Building	A/C/_		A/C/_		

Note: The M&V options are distributed by utility type as Electric / Fuel / Water. An underscore indicates where an option is not applicable. A single letter represents the option type, for example, " A " is Option A.

Specific Measurement & Verification (M&V) Options Chosen:

The Measurement and Verification (M&V) options chosen for the Energy Conservation Measures (ECMs) for the Floral Park-Bellerose UFSD are described as follows:

Option A – Electric: Verification techniques determine savings by measuring the performance of a system before and after a retrofit, either through physical measurement/monitoring or the use of manufacturer data, and multiplying the difference by an agreed-upon, measured, or a mutually agreed factor, such as hours of operation. The value of the energy savings will be derived from the measured data and engineering formulae included herein, and the applicable energy charges as defined herein.

Option C – Fuel: Verification techniques involve utility whole building meter analysis, reviewing overall energy use, and identifying the effects of energy projects on a facility. Energy usage for the Facilities for such Guarantee Year will be summarized and compared with the adjusted Baseline Period energy usage for the Facilities through the use of energy accounting software. The difference between the adjusted Baseline Period energy usage and the Guarantee Year energy usage will be the Energy avoidance. The difference between the adjusted Baseline Period energy usage multiplied by the applicable energy rate as defined herein, and the Guarantee Year energy usage multiplied by the applicable energy rate, will be used to calculate the Energy Cost avoidance.

Specific ECM M&V Plan Summary Table

M&V Table 1.1

ECM #	ECM Intent	IPMVP Option	Key Parameters Measured	Significant Stipulated Values	Measurement Duration and Frequency	Measurement Sample Size for Groups w/ Similar Characteristics	As-Built Analysis Procedure	Annual M&V Activities
ECM#1 Lighting & Control Upgrades	Reduce power draw due to higher fixture efficiency and optimization of schedules	A – Electric	Fixture type kW measurements included in PRE-retrofit and final "as-builts" POST-retrofit spreadsheet with calculated savings	Run hours	Spot One Time Pre & Post	Pre and Post: 80/20/0.5 (conf/prec/Cv) for each group by fixture type over whole program	Apply measured values and contractual utility rate to engineering calculations.	Inspect visually for proper operation. Use as-built savings results.
ECM#1 Lighting & Control Upgrades	Reduce power draw due to higher fixture efficiency and optimization of schedules (*Heat penalty*)	C – Fuel	Fuel therms at the whole building level by monthly utility bill	Weather, bldg load, run hours, & temperature	Monthly utility bill analysis	100%	Utilize regression analysis of building based on HDD and/or CDD and input utility bills to generate utility savings	Utility bill analysis for fuel
ECM#2 Boiler Plant Upgrades	Reduce fuel use due to higher combustion efficiency	C - Fuel	Boilers Pre-retrofit Combustion efficiency at high, medium, and low firing rates where applicable. MMBTU at the whole building level by monthly utility bill	Weather, bldg load, run hours, & temperature	Spot one-time pre/post installation for combustion efficiency testing. Monthly utility bill analysis.	100%	Utilize regression analysis of building based on HDD and/or CDD and input utility bills to generate utility savings	Utility bill analysis for fuel

Exhibit D -7: Detailed M&V Plan
Floral Park-Bellerose UFSD

ECM #	ECM Intent	IPMVP Option	Key Parameters Measured	Significant Stipulated Values	Measurement Duration and Frequency	Measurement Sample Size for Groups w/ Similar Characteristics	As-Built Analysis Procedure	Annual M&V Activities
ECM#3 Building Management System Upgrades	Reduce cooling & heating load due to controls upgrades to optimize equipment scheduling and setpoints	A – Electric	Space temp, heating & cooling setpoints, fan run time, valve status, DA temp, OA temp by BMS trend	Bldg load, run hours, & temperature	Continuous trending at 1 hour intervals	Post: 80/20/0.5 (conf/prec/Cv) for each equipment type per building.	Apply measured values and base year utility rate to engineering calculations	Inspect visually for proper operation. Use as-built savings results.
ECM#3 Building Management System Upgrades	Reduce cooling & heating load due to controls upgrades to optimize equipment scheduling and setpoints	C – Fuel	Fuel therms at the whole building level by monthly utility bill	Weather, bldg load, run hours, & temperature	Monthly utility bill analysis	100%	Utilize regression analysis of building based on HDD and/or CDD and input utility bills to generate utility savings	Utility bill analysis for fuel
ECM#3A Building Management System Upgrades *(Plug Load Controls)*	Reduce electric usage by scheduling equipment hours of operation	A – Electric	Quantity and type of equipment connected from front end software and equipment	Equipment power draw	Spot one-time post	100%	Apply measured values and contractual utility rate to engineering calculations.	Inspect visually for proper operation. Use as-built savings results.
ECM#4 Pipe Insulation	Reduce fuel use due to minimizing pipe heat loss	C - Fuel	Fuel therms at the whole building level by monthly utility bill	Weather, bldg load, run hours, & temperature	Monthly utility bill analysis	100%	Utilize regression analysis of building based on HDD and/or CDD and input utility bills to generate utility savings	Utility bill analysis for fuel
ECM#5 Steam Traps Replacement	Reduce htg load due to steam losses to atmosphere/unoccupied spaces	C - Fuel	Fuel therms at the whole building level by monthly utility bill	Weather, bldg load, run hours, & temperature	Monthly utility bill analysis	100%	Utilize regression analysis of building based on HDD and/or CDD and input utility bills to generate utility savings	Utility bill analysis for fuel