

**DEPARTMENT OF FACILITIES**

**DANNY CLEMENS, DIRECTOR**  
TRACY PARSLEY, MAINTENANCE SUPERVISOR  
THOMAS STOKES, CUSTODIAL SUPERVISOR  
GEORGE BROCK, ENERGY MANAGER

**MEMO**

**TO:** Dr. Jesse Bacon, Superintendent  
**FROM:** Danny Clemens, Director of Facilities  
**Date:** January 13, 2025  
**RE:** Trane Contract- Amendment #2 **DC**

Requested for approval is to amend the contract between Bullitt County Public Schools and Trane. The amendment will remove the old Old Mill Elementary building from the contract in lieu of the new school building.

**I recommend approval of this request.**

Attached paperwork is listed below with *action items* noted for each:

- Bullitt GESC - Amendment No. 2 to Exhibits E, E.1, E.2, E.27, E.28 & E.29— for Board Signature
- AIA Exh E.1 Old Mill ES - Lighting - Amendment No. 2- Board Reference
- AIA Exh E.2 Old Mill ES - New HVAC - Amendment No. 2- Board Reference
- AIA Exh E Energy Savings Guarantee - Bullitt - Amendment No. 2- Board Reference
- AIA Exh E.27 Multi-facility - Dishwasher Booster Upgrade - Amendment No. 2- Board Reference
- AIA Exh E.28 Multi-facility Water Conservation - Amendment No. 2- Board Reference
- AIA Exh E.29 Ops Sav - Bullitt - Amendment No. 2- Board Reference

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**OUR MISSION IS TO INSPIRE AND EQUIP OUR STUDENTS TO SUCCEED IN LIFE**

**BULLITT COUNTY PUBLIC SCHOOLS IS AN EQUAL EDUCATION AND EMPLOYMENT INSTITUTION**

**BULLITT COUNTY PUBLIC SCHOOLS and TRANE U.S. INC.  
GUARANTEED ENERGY SAVINGS CONTRACT  
TRANE CONTRACT NO. P3-47458**

**AMENDMENT NO. 2 TO STANDARD FORM OF AGREEMENT BETWEEN OWNER AND  
DESIGN BUILDER AIA141-2004  
(AMENDMENT TO EXHIBITS E, E.1, E.2, E.27, E.28 & E.29)**

This AMENDMENT NO. 2 TO STANDARD FORM OF AGREEMENT BETWEEN OWNER AND DESIGN BUILDER AIA141-2004 (this "Amendment No. 2") entered into this 1<sup>st</sup> day of February 2024, by and between TRANE U.S. INC. ("Qualified Provider"), and BULLITT COUNTY PUBLIC SCHOOLS ("Owner").

WITNESSETH:

WHEREAS Qualified Provider, and Owner are parties to that certain STANDARD FORM OF AGREEMENT BETWEEN OWNER AND DESIGN BUILDER AIA141-2004, dated as of the May 21, 2018 (as amended, supplemented, or restated from time to time, the "Agreement"); and

WHEREAS, Owner is not occupying Old Mill Elementary School and has built a new school to replace the facility under the STANDARD FORM OF AGREEMENT BETWEEN OWNER AND DESIGN BUILDER AIA141-2004; and

WHEREAS, this Amendment No. 2 is dated February 1, 2024 to reflect the parties agreement with respect to the subject matter of this Amendment No. 2; and

WHEREAS, Owner and Qualified Provider have agreed to certain modifications to Exhibit E (Energy Savings Guarantee & Operational Savings) and the related sub-Exhibits E.1, E.2, E.27, E.28 & E.29 of the Agreement, which modifications the parties intend to document by this Amendment No. 2; and

NOW, THEREFORE, in consideration of the mutual covenants herein contained and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Qualified Provider and Owner, intending to be legally bound, hereby agree to the following:

1. **Defined Terms.** Capitalized terms used in this Amendment which are not specifically defined herein, have the meanings given to such terms in the Agreement.
2. **Amendment to Exhibit E.** Exhibit E (Energy Savings Guarantee & Operational Savings) of the Agreement between Owner and Design Builder AIA141-2004, which was previously amended on December 17, 2019 under Amendment No. 1, is hereby amended again by removing such Exhibit E in its entirety and replacing such Exhibit with "Exhibit E – Amended February 1, 2024" to this Amendment No. 2.
3. **Removal of Exhibit E.1.** Exhibit E.1 (Guarantee – Lighting Upgrade – Old Mill Elementary School) of the Agreement between Owner and Design Builder AIA141-2004 is hereby removed in its entirety to this Amendment No. 2.
4. **Removal of Exhibit E.2.** Exhibit E.2 (Guarantee – Installation of a New HVAC System – Old Mill Elementary School) of the Agreement between Owner and Design Builder AIA141-2004 is hereby removed in its entirety to this Amendment No. 2.

5. **Amendment to Exhibit E.27.** Exhibit E.27 (Guarantee – Installation of New Natural Gas Booster Heater for Dishwashers – Multiple Facilities) of the Agreement between Owner and Design Builder AIA141-2004 is hereby amended by removing such Exhibit E.27 in its entirety and replacing such Exhibit with “Exhibit E.27 – Amended February 1, 2024” to this Amendment No. 2.

6. **Amendment to Exhibit E.28.** Exhibit E.28 (Guarantee – Water Conservation Retrofit – Multiple Facilities) of the Agreement between Owner and Design Builder AIA141-2004, which was previously amended on December 17, 2019 under Amendment No. 1, is hereby amended again by removing such Exhibit E.28 in its entirety and replacing such Exhibit with “Exhibit E.28 – Amended February 1, 2024” to this Amendment No. 2.

7. **Amendment to Exhibit E.29.** Exhibit E.29 (Guarantee – Direct Cost Avoidance Operational Savings) of the Agreement between Owner and Design Builder AIA141-2004 is hereby amended by removing such Exhibit E.29 in its entirety and replacing such Exhibit with “Exhibit E.29 – Amended February 1, 2024” to this Amendment No. 2.

8. **Integration.** All other provisions of Agreement, except as specifically amended hereby, shall remain in full force and effect, and all references to the Agreement shall be deemed to include the provisions of this Amendment No. 2

9. **Validity.** If any term or condition of this Agreement is invalid, illegal or capable of being enforced by any rule of law, all other terms and conditions of this Agreement will nevertheless remain in full force and effect as long as the economic or legal substance of the transaction contemplated hereby is not affected in a manner adverse to any party hereto.

10. **Execution in Counterparts.** This Amendment may be executed one or more counterparts, each of which shall be deemed to be an original and shall constitute one and the same instrument. This Amendment may be executed by facsimile, and each such facsimile signature shall be deemed to be an original.

**IN WITNESS THEREOF**, the Parties hereto, intending to be legally bound, have executed this AMENDMENT NO. 2 TO the STANDARD FORM OF AGREEMENT BETWEEN OWNER AND DESIGN BUILDER AIA141-2004 as of the date first written above.

**Trane U.S. Inc.**

**Bullitt County Public Schools**

By: \_\_\_\_\_

By: \_\_\_\_\_

Name: Chuck Bowers

Name: Jesse Bacon

Its: Area General Manager

Its: Superintendent



~~EXHIBIT E.1 – EXHIBIT E.1 REMOVED UNDER AMENDMENT NO. 2~~  
~~Energy Savings Guarantee~~  
~~Lighting Upgrade – Old Mill Elementary School~~

**1.0 Agreed Upon Parameters:**

*The following are mutually agreed upon parameters that form the basis of this Energy Savings Guarantee.*

a) Applicability:

This Energy Savings Guarantee applies to the high efficiency lighting upgrade energy conservation measure installed by Qualified Provider at Old Mill Elementary School as described in Tables 1 and 2.

**2.0 Pre-Retrofit Consumption Data:**

*The following describes the methodology for proving per fixture wattage of each existing lighting fixture prior to the installation of energy efficient lighting equipment. Actual wattage measurements are taken to validate the pre-retrofit, per fixture wattage as represented in the lighting audits and analyses performed to date.*

a) Measurement Methodology:

Qualified Provider has proposed to retrofit existing fixtures with energy efficient products. The purpose of this section is to validate the wattage assumed in these estimates through actual measurement.

Different types of existing fixtures were encountered during the detailed survey. The tables in Section 2.0.b provides a brief description of each fixture, a space for estimated fixture wattage, and notes the quantity of each fixture.

In order to validate the wattage estimates of the existing fixtures, Qualified Provider will measure the actual wattage consumed by a sample of each. Appropriate representatives of Owner should be present to witness the measurement. The measurements will be taken utilizing an accurate, properly calibrated, power factor corrected wattmeter. A qualified electrician will take the measurements, witnessed by Owner (at its option) and Qualified Provider. The cost of this measurement and the responsibility for the provision of a qualified electrician will be borne entirely by Qualified Provider.

### Pre-ECM Installation Wattage Measurement Sample Size Determination

The lighting fixture types and quantities to be measured prior to installation are based on the methodology defined in the IPMVP 2012 Volume 1 Section B.3. The first step was to determine at each site which fixture(s) make up at least 70% of the existing total lighting load.

The sample criterion for lighting was based on 95% confidence and 5% precision. The quantities for these chosen fixtures were entered into a spreadsheet that uses the initial sample size formula defined by the IPMVP. Based on 95% confidence and 5% precision and with a coefficient of variation to be 0.3, the initial sample size is calculated to be 24.

$$n_0 = \frac{z^2 * cv^2}{e^2}$$

Where:

\_\_\_\_\_  $n_0$  = the initial estimate of the required sampling size, before sampling begins

\_\_\_\_\_  $z$  = the standard normal distribution value from the t-Table, with an infinite number of readings, and for the desired confidence level (95% = 1.96)

\_\_\_\_\_  $e$  = the desired level of precision

\_\_\_\_\_  $cv$  = the coefficient of variance, which is defined by the standard deviation of the readings divided by the mean. Until the mean and standard deviation of the population can be estimated from actual samples, 0.3 will be used as an initial estimate for the  $cv$ .

$$n_0 = \frac{1.64^2 * 0.3^2}{0.1^2}$$

Small sample population test – if the actual fixture counts (population) for the type being sampled is less than 484 (24 x 20), then the “Finite Population Adjustment” as outlined in the aforementioned IPMVP 2012 Volume 1 Section B.3. The fixture count is inserted into the Finite Population Adjustment formula to adjust initial sample size estimate for small populations. The example below uses a fixture count of 237 total fixtures in the building.

$$n = \frac{n_0 * N}{n_0 + N}$$

Where:

\_\_\_\_\_  $n_0$  = the initial estimate of the required sampling size, before sampling begins

\_\_\_\_\_  $n$  = the new, adjusted sample size for small populations

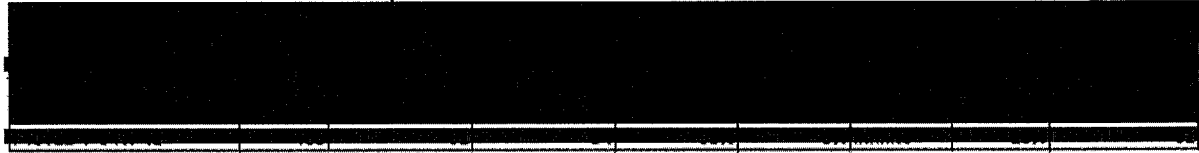
\_\_\_\_\_  $N$  = Total population size

$$n = \frac{24 * 237}{24 + 237}$$

Finalized Sample Size – The initial sample size ( $n_0$ ) is determined by using an assumed  $cv$ , so the actual  $cv$  must be calculated in order to find out the exact number of samples needed. If the actual  $cv$  turns out to be less than the initial  $cv$  (0.3), then the required sample size will be unnecessarily large to meet the precision goals. Conversely, if the actual  $cv$  turns out to be larger than the initial assumed  $cv$ , then the sample size would, theoretically, increase beyond the initial computed sample size.



Table 1.1 – Pre-installation Sample Size

A large black rectangular redaction box covers the content of Table 1.1, which was intended to show the pre-installation sample size for various lighting fixtures.

### 3.0 Post-Retrofit Measurements:

*The following describes the methodology for proving per fixture wattage reductions as a result of the installation of energy efficient lighting equipment. Actual wattage measurements are taken to validate the post-retrofit, per fixture wattage as represented in the lighting audits and analyses performed to date.*

a) Measurement Methodology:

Qualified Provider has proposed to retrofit existing fixtures with energy efficient products. The detailed survey/scope of work incorporated herein, illustrates the types of retrofits installed, and estimates the wattage of the retrofits. The purpose of this section is to validate these estimates through actual wattage measurement.

Different types of retrofit strategies are employed in the applicable areas. The tables in this Section 3.0.b of this Exhibit E.1 lists the retrofit types, and provides a brief description of the retrofit.

In order to validate the wattage estimates of the lighting retrofits, Qualified Provider will measure the actual wattage consumed by a sample of the different retrofits. This measurement will occur once, following installation of the lighting retrofit. Appropriate representatives of Owner should be present to witness the measurement. The measurements will be taken utilizing an accurate, properly calibrated, power factor corrected wattmeter. A qualified electrician will take the measurements after 100 burn hours, witnessed by Owner (at its option) and Qualified Provider. The cost of this measurement and the responsibility for the provision of a qualified electrician will be borne entirely by Qualified Provider. It is anticipated that a sufficient representative sample of each retrofit type will be measured and documented within 60 days of completion of the lighting retrofit.

Post-Installation Sampling Plan – the fixture types that will be sampled will be **highlighted in yellow** for ease of review. The fixture types measured will represent over 70% of the total lighting kW load in that building. The post wattage measurement size determination method is the same as the pre-measurement determination with the exception of the coefficient of variance. The coefficient of variance used was 0.2 instead of 0.3.





6. Variance, S<sup>2</sup>, can then be calculated.
  - a.  $S^2 = \text{sum of squares} / (\text{number of readings} - 1)$
7. Standard Deviation is the square root of Variance S<sup>2</sup>.
8.  $Cv = \text{Standard Deviation} / \text{average measured value}$
9. Refer to Table 2.3 t distribution table @ 95% confidence from Pg.90 IPMVP shown in Table 3.
  - a. Based on number of sample measurements select t-value that corresponds to number of measurements minus 1.
10. Absolute precision = standard error x T value
11. Relative precision = absolute precision / mean value

**Table 3 – T-Distribution Table IPMVP**

2	4.30
3	3.18
4	2.78
5	2.57
6	2.45
7	2.36
8	2.31
9	2.26
10	2.23
11	2.20
12	2.18
13	2.16
14	2.14
15	2.13
16	2.12
17	2.11
18	2.10
19	2.09
21	2.08
23	2.07
25	2.06
27	2.05
31	2.04
35	2.03
41	2.02
49	2.01
60	2.00
120	1.98
Infinity	1.96

The result will be a calculated mean value for each set of measurements and the relative precision %. The calculated mean value will be compared to the projected watts per

fixture in Table 2. The mean value should be equal to or less than the project value along with the relative precision being 5% or less. If the relative precision is less than 5%, more measurements will need to be taken for that fixture type.

#### **4.0 — Computation of Savings:**

~~The following describes the methodology for computing Actual Energy Use Savings based on validated wattage and presents guaranteed Energy Use Savings.~~

##### ~~a) — Computation and Presentation of Energy Use Savings:~~

~~Once the true pre- and post-retrofit, per fixture wattage have been established and documented in the appropriate Tables of this Exhibit, the values will be inserted into the appropriate columns of the detailed audit/scope of work spreadsheets. These actual values will supersede the estimated values currently represented in the spreadsheet. Hence, the resulting spreadsheets will represent the "as-built" conditions.~~

~~If the actual wattages differ from the previous estimates by less than or equal to 5%, it is considered to be within an acceptable tolerance based on Qualified Provider's conservative safety factors for this energy conservation measure, and therefore satisfies the Energy Savings Guarantee.~~

~~If the actual wattages differ by more than 5%, the pre- and post-retrofit tables will be adjusted to reflect the actual wattages of the fixtures.~~

~~The calculations do not take into account any HVAC interaction.~~

##### ~~b) — Presentation of Savings:~~

~~The energy conservation measure described herein will result in the following effect on energy usage:~~

~~Total Annual Guaranteed kWh Energy Use Savings: 166,309 kWh~~

~~Total Annual Guaranteed kW Energy Use Savings: 712 kW~~

**EXHIBIT E.2 – EXHIBIT E.2 REMOVED UNDER AMENDMENT NO. 2**  
**Guarantee**  
**Installation of a New HVAC System – Old Mill Elementary School**

**1.0 Agreed Upon Parameters:**

*The following are mutually agreed upon parameters that form the basis of this performance guarantee.*

a) Applicability:

This performance guarantee applies to the energy conservation measure involving the installation of a new HVAC and building automation system at Old Mill Elementary School in Bullitt County Public Schools.

b) Existing Conditions:

For the purposes of this Agreement, the air handlers, heating and cooling equipment, and all related appurtenances (pumps, etc.) operate and consume energy as per the TRACE™ 700 building modeling software analysis. Trane based this building simulation on extensive survey and analysis. The Customer and Trane collaboratively agreed upon its assumptions and results throughout the modeling process.

c) Comfort Standards:

For the purpose of this Agreement, Qualified Provider assumes that indoor temperatures will be maintained at the conditions set forth in Tables 3 and 4 of Section 3 of this Exhibit.

d) Existing HVAC Equipment Efficiency:

Analysis has determined the efficiency for the existing HVAC equipment, which is provided in the Table 1 below:

**Table 1**

Existing Equipment	Qty	Existing System Efficiency
Existing Heat Pump Units	62	0.761 kW/ton
Rooftop Units	6	1.120 kW/ton
Rooftop Units	4	1.110 kW/ton
Existing Boiler	4	77%

These values form the basis of the pre-retrofit condition and are used in the TRACE™ 700 modeling efforts to recreate the existing energy consumption profile. The values in the Table 1 are mutually agreed to by Customer and Trane for the purposes of this Agreement.

## 2.0 Pre-Retrofit Consumption Data:

*The pre-retrofit consumption data was established utilizing the following methodology agreed to by Customer and Trane.*

### a) Measurement Methodology:

TRACE™ 700 building simulation software was used to model the energy consumption of the building. Known parameters such as local weather data, internal building loads (people and equipment), occupancy data, utility costs, percent outside air, etc., were all utilized in the modeling of the base case. The accuracy of the pre-retrofit energy model was validated by its correlation to the actual utility data for Old Mill Elementary School. Its assumptions and results were collaboratively agreed upon by Owner and Qualified Provider throughout the modeling process. The measurement of the pre-installation equipment performance data is based on the methodology defined in IPMVP 2012.

The pre-retrofit condition can be characterized as a situation where the efficiencies of the existing HVAC equipment has diminished due to age and operational control of the existing inefficient HVAC systems was not optimum.

## 3.0 Post-Retrofit Measurements:

*The following describes the agreed to methodology for computing Energy Use Savings.*

### a) Measurement Methodology: New BAS System

Trane has completed an engineering analysis for this conservation measure utilizing TRACE™ 700 building simulation software. The energy savings due to this conservation measure are related to maintaining the control strategies such as scheduled occupied and unoccupied temperature set points, fan scheduling and economizer control. The complete list of control strategies is listed in Table 2 below.

**Table 2**

<u>Control Strategy</u>	<u>Validation Methodology</u>
Supply Fan Variable Frequency Drives	DDC system report showing that the supply fan variable frequency drives are modulating supply air flow
Free Cooling Outside Air Economizers	DDC system report showing that the free cooling is being utilized when outside air conditions are appropriate
Hot Water Pump Variable Frequency Drives	DDC system report showing that the hot water pump variable frequency drives are modulating hot water flow
Hot Water Temperature Reset	DDC system report showing that the hot water supply temperature is reset based on load or outside air temperature
Demand Control Ventilation	DDC system report showing that the ventilation air volume is adjusted based on CO2 levels
Occupied and Unoccupied Temperature Control	DDC system report showing occupied temperature and unoccupied temperature setback

Since all external variables (weather, hours of operation, utility rates, building envelope values, occupancy, percent outdoor air, etc.) have been established, the remaining items to validate are that the control system truly controls to the strategies listed in Table 2.

In order to validate the performance of this conservation measure, Trane will monitor the operation of the equipment and the internal environmental conditions using the building automation system. The DDC system will generate a report validating the control strategies listed in Table 2.

Throughout the term of this Agreement, Trane will validate that the room temperatures are capable of being maintained to the set points as per Tables 3 and 4 during the year utilizing the building automation system. The validation report will consist of a 24-hour trend log for one weekday and one weekend day on a quarterly basis.

**Table 3**

Area	Weekdays	Weekends
Classrooms, Media Center, Gym, Cafeteria—January thru May	Occupied Hrs: 6am—4pm Unoccupied Hrs: 4pm—6am	Unoccupied: All Hours Except for Special Events / Games
Classrooms, Media Center, Gym, Cafeteria—June thru July	Occupied Hrs: 6am—3pm Unoccupied Hrs: 3pm—6am	Unoccupied: All Hours Except for Special Events / Games
Classrooms, Media Center, Gym, Cafeteria—August thru December	Occupied Hrs: 6am—4pm Unoccupied Hrs: 6pm—6am	Unoccupied: All Hours Except for Special Events / Games
Offices—All Year	Occupied Hrs: 6am—6pm Unoccupied Hrs: 6pm—6am	Unoccupied: All Hours—Except for Special Events / Games
Offices—June thru July	Occupied Hrs: 7am—6pm Unoccupied Hrs: 6pm—6am	Unoccupied: All Hours—Except for Special Events / Games
Offices—August thru December	Occupied Hrs: 6am—6pm Unoccupied Hrs: 6pm—6am	Unoccupied: All Hours—Except for Special Events / Games
Kitchen—January thru May	Occupied Hrs: 6am—3pm Unoccupied Hrs: 3pm—6am	Unoccupied: All Hours
Kitchen—June thru July	Occupied Hrs: 6am—2pm Unoccupied Hrs: 2pm—6am	Unoccupied: All Hours
Kitchen—August thru December	Occupied Hrs: 6am—3pm Unoccupied Hrs: 3pm—6am	Unoccupied: All Hours

**Table 4**

Area	Room Temperatures (within $\pm 2^\circ$ F)
All Areas—January thru March	Occupied Cooling: 73° F Unoccupied Cooling: 75° F Occupied Heating: 72° F Unoccupied Heating: 65° F
All Areas—April thru May	Occupied Cooling: 71° F Unoccupied Cooling: 75° F Occupied Heating: 69° F Unoccupied Heating: 65° F
All Areas—June thru July	Occupied Cooling: 71° F Unoccupied Cooling: 75° F Occupied Heating: 69° F Unoccupied Heating: 65° F
All Areas—August thru October	Occupied Cooling: 71° F Unoccupied Cooling: 75° F Occupied Heating: 69° F Unoccupied Heating: 65° F
All Areas—November thru December	Occupied Cooling: 73° F Unoccupied Cooling: 75° F Occupied Heating: 72° F Unoccupied Heating: 65° F

**Note:**

It should be noted that if the building can be operated less than the agreed to hours or can be maintained at cooler heating or warmer cooling temperatures, there will be additional savings realized by the Customer.

b) Measurement Methodology: New HVAC Equipment

Trane has completed an engineering analysis for this conservation measure utilizing the TRACE™ 700 building simulation software. The bulk of energy savings due to this conservation measure are related to installing new high efficiency equipment that uses less energy to provide the cooling and heating capacity than the existing HVAC equipment.

Since all external variables (weather, hours of operation, utility rates, building envelope values, occupancy, etc.) have been established, the remaining items to validate are that the true efficiency of the new equipment matches that listed below in Table 5. To accomplish this, the equipment manufacturer will provide a certified analysis from the proper rating agencies or the efficiency of the equipment will be measured by Trane after installation.

**Table 5**

Equipment	Qty	Cooling Efficiency	Heating Efficiency
New VAV Rooftop Units	4	11.0 EER	N/A
New VAV Rooftop Units	4	10.6 EER	N/A
New Rooftop Unit	10	13.0 EER	N/A
New Rooftop Unit	4	12.9 EER	N/A
New Rooftop Unit	4	11.0 EER	N/A
New Rooftop Unit	4	12.4 EER	N/A
New Rooftop Unit	4	12.6 EER	N/A
New Rooftop Unit	4	13.6 EER	N/A
New Split A/C Unit	4	12.9 EER	N/A
New VRF	9	13.4 EER	2 COP
New Boiler	4	N/A	90%

**4.0 Computation of Savings:**

*The following describes the agreed to methodology for computing Energy Use Savings based on the validated output from the BAS system.*

a) Computation of Energy Use Savings: New BAS System

The building automation system will be used to generate a report showing that occupied and unoccupied set points are being maintained, the air handler units are being turned off or cycled as possible, and the control strategies have been implemented. This report will consist of 24-hour trending logs run quarterly during the term of the Agreement, and will constitute the documentation showing the system saves the amount of energy predicted by the TRACE™ 700 building simulation.

Once the true operating conditions and control strategies have been observed, a comparison will be performed to determine the amount of variance between the agreed to operating conditions presented in Tables 3 and 4 and the actual operating conditions. If needed, a baseline adjustment will be made to compensate for additional runtimes by adjusting the original model to reflect the new temperatures and/or runtimes.

Trane will enter the true monitored hours of setback into the TRACE™ 700 software file previously utilized to calculate savings based on the projected (future) operation. The building simulation will only be rerun if the number of daily setback hours differ from the previous simulation by more than 10% or the actual unoccupied space temperatures vary from the projected temperatures by more than ± 3 degrees.

If the actual runtimes differ from the previous simulation by less than or equal to 10% or the actual space temperatures vary by less than  $\pm 3$  degrees, it is considered to be within an acceptable tolerance based on Trane's conservative safety factors for this energy conservation measure, and therefore satisfies the Guarantee. If the energy model is rerun, the simulation reflecting the actual runtimes will be compared to the simulation reflecting the pre-retrofit operation. This yields actual annual Energy Use Savings, consistent with the original engineering analysis, and the energy model, which was validated by its correlation to the actual utility data for Old Mill Elementary School.

b) Computation of Energy Use Savings: New HVAC Equipment

Once the new HVAC equipment efficiency is certified or measured, actual annual Energy Use Savings will be calculated. To accomplish this, Trane will enter the certified or measured efficiency of the new HVAC units into the analysis tool previously used to calculate savings based on the projected (future) operation. The building simulation will only be rerun if the efficiency is less than the efficiency noted below in the Minimum Efficiency Threshold.

**Table 6**

Equipment	Tested Efficiency being provided (as noted in Section 3.0)	Minimum Efficiency Threshold
New VAV Rooftop Units	11.0 EER	10.5 EER
New VAV Rooftop Units	10.6 EER	10.1 EER
New Rooftop Unit	13.0 EER	12.4 EER
New Rooftop Unit	12.9 EER	12.3 EER
New Rooftop Unit	11.0 EER	10.5 EER
New Rooftop Unit	12.4 EER	11.8 EER
New Rooftop Unit	12.6 EER	12.0 EER
New Rooftop Unit	13.6 EER	12.9 EER
New Split A/C Unit	12.9 EER	12.3 EER
New VRF	13.4 EER / 2 COP	12.7 EER / 1.9 EER
New Boiler	90%	86%

If the tested efficiency is greater than or equal to the minimum efficiency threshold noted above, the HVAC unit's efficiency is within an acceptable tolerance based on Trane's conservative safety factors for this energy conservation measure and, therefore, satisfies the Guarantee.

If the energy model is rerun, the simulation run reflecting the verified efficiency will be compared to the simulation run reflecting the pre-retrofit operation to yield actual annual Energy Use Savings which is consistent with the original engineering analysis.

c) Presentation of Savings:

The energy conservation measure described herein will result in the following effect on energy usage:

Total Annual Guaranteed kWh Energy Use Savings: 96,940 kWh

Total Annual Guaranteed kW Energy Use Savings: 123 kW

Total Annual Guaranteed Therm Energy Use Savings: 5,070 Therms

**EXHIBIT E – Amended February 1, 2024**  
**Energy Savings Guarantee & Operational Savings**

Section 1. **Energy Savings Guarantee.** Subject to the terms and conditions of this Exhibit E and the sub-Exhibits hereof, Qualified Provider guarantees that, as a result of the Services Qualified Provider will furnish hereunder, Owner will realize the energy savings shown in Table 1 (the "Energy Savings"), in each consecutive twelve-month period following the Commencement Date (each such twelve-month period, a "Guarantee Year") for the Guarantee Term (collectively, the "Energy Savings Guarantee"). The Energy Savings Guarantee is for energy savings in the aggregate, not on a per building basis, per energy conservation measure ("ECM"), or by fuel type, notwithstanding the presentation of the Energy Savings in this Exhibit or sub-Exhibits hereto.

In addition to Energy Savings, Qualified Provider and Owner agree that Owner will realize Operational Savings as a result of Qualified Provider's performance of the Services, as more fully described in Section 5 and in the applicable sub-Exhibits hereof.

Table 1 below sets forth the monetary value of Energy Savings and Operational Savings (calculated utilizing the Adjusted Base Utility Rate(s) and applicable annual Operational Savings escalation).

**Table 1 – Monetary Value of Annual Energy Savings with 4.5% Annual Utility Escalation and Operational Savings Calculated Utilizing the Applicable Adjusted Base Utility Rate and Applicable Annual Operational Savings Escalation of 2.5%**

Year	Total Savings (\$)			Total Savings and Capital Cost Avoidance
	Energy Savings	Operational Savings (stipulated)	Capital Cost Avoidance	
<b>Installation Period Savings</b>	\$250,000	\$0	\$0	\$250,000
<b>1</b>	\$414,421	\$35,114	\$0	\$449,535
<b>2</b>	\$433,069	\$35,992	\$0	\$469,061
<b>3</b>	\$452,558	\$36,892	\$0	\$489,449
<b>4</b>	\$472,923	\$-37,814	\$0	\$510,737
	\$448,931	\$29,408		\$478,439
<b>5</b>	\$494,204	\$-38,759	\$0	\$532,964
	\$469,133	\$30,143		\$499,276
<b>6</b>	\$516,443	\$-39,728	\$0	\$556,172
	\$490,244	\$30,896		\$521,140
<b>7</b>	\$539,683	\$-40,721	\$0	\$580,405
	\$512,305	\$31,669		\$543,974
<b>8</b>	\$563,969	\$-41,740	\$0	\$605,709
	\$535,359	\$32,461		\$567,819
<b>9</b>	\$589,348	\$-42,783	\$0	\$632,134
	\$559,450	\$33,272		\$592,722
<b>10</b>	\$615,868	\$-43,853	\$0	\$659,724
	\$584,625	\$34,104		\$618,729
<b>11</b>	\$643,582	\$-44,949	\$0	\$688,534
	\$610,933	\$34,957		\$645,890
<b>12</b>	\$672,544	\$-46,073	\$0	\$718,616
	\$638,425	\$35,830		\$674,256
<b>13</b>	\$702,808	\$-47,224	\$0	\$750,033
	\$667,154	\$36,726		\$703,881
<b>14</b>	\$734,434	\$-48,405	\$0	\$782,840
	\$697,176	\$37,644		\$734,821



	\$767,484	-\$49,615		\$817,099
15	\$728,594	\$38,585	\$0	\$767,135
	\$802,021	-\$50,856		\$852,876
16	\$761,334	\$39,550	\$0	\$800,884
	\$838,112	-\$52,127		\$890,239
17	\$795,594	\$40,539	\$0	\$836,133
	\$875,827	-\$53,430		\$929,257
18	\$831,396	\$41,552	\$0	\$872,948
	\$915,239	-\$54,766		\$970,005
19	\$868,808	\$42,591	\$0	\$911,400
	\$956,425	-\$56,135		\$1,012,560
20	\$907,905	\$43,656	\$0	\$951,561
<b>Grand Total</b>	<b>\$13,000,962</b>	<b>\$896,975</b>	<b>\$0</b>	<b>-\$13,897,938</b>
	<b>\$12,407,369</b>	<b>\$721,582</b>		<b>\$13,128,951</b>

**Section 2. Measurement and Verification of Energy Savings.** Four (4) different methods may be utilized to measure and verify ("M&V") Energy Savings. Each method is in accordance with the International Performance Measurement and Verification Protocol (IPMVP). The four (4) M&V methods are summarized below.

**Option A. Partially Measured Retrofit Isolation.** The verification techniques for Option A determine energy savings by measuring the capacity or efficiency of a system before and after a retrofit, and multiplying the difference by an agreed-upon or "stipulated" factor, such as hours of operation or load on the system. Careful review of ECM design and installation ensure that stipulated values fairly represent the probable actual value.

**Option B. Retrofit Isolation. (This option not used)** Verification techniques for Option B are designed for projects where long-term continuous measurement of performance is desired. Under Option B, individual loads are continuously monitored to determine performance, and this measured performance is compared with a baseline to determine savings. Option B M&V techniques provide long-term persistence data on ECM operation and performance. This data can be used to improve or optimize the operation of the equipment on a real-time basis, thereby improving the benefit of the retrofit. Option B also relies on the direct measurement of affected end uses.

**Option C. Whole Facility. (This option not used)** Verification techniques for Option C determine savings by studying overall energy use in a facility and identifying the effects of energy projects from changes in overall energy use patterns. This approach is intended for measurements of the whole-facility or specific meter baseline energy use, and measurements of whole-facility or specific meter post-implementation (Post) energy use can be measured. The methodology to establish baseline and Post parameter identification, modeling approach and baseline or model adjustments will be defined in the applicable sub-Exhibit. Periodic inspections of baseline energy usage, operating practices, and facility and equipment, and meter measurements of the will be necessary to verify the on-going efficient operation of the equipment, systems, practices and facility, and saving attainment.

**Option D. Calibrated Simulation. (This option not used)** Option D is intended for energy retrofits where calibrated simulation of baseline energy use and calibrated simulations of post-installation energy consumption are used to measure savings from the retrofit. Option D can involve measurements of energy use both before and after the retrofit for specific equipment/systems or whole-building data for calibrating the simulation(s). Simulation routines must be demonstrated to adequately model actual energy performance measured in the facility. This option usually requires considerable skill in calibrated simulation. Energy use simulation is calibrated with hourly or monthly utility billing data and/or end use metering.

**Section 3. Summary of Energy Savings and applicable M&V.** The type and location of energy conservation measures installed determine which M&V calculation method shall be utilized. Table 2 sets forth the M&V method utilized, by building, ECM or ECM type, as applicable, and the Energy Savings Guarantee applicable thereto. Specific M&V methodologies and stipulations for each savings strategy and applicable M&V method are detailed in the applicable sub-Exhibits to this Exhibit E.

**Table 2 – Annual Energy Savings Guarantee per Building, ECM or ECM Type**

Building, ECM or ECM Type	M&V Type and Applicable Energy Savings			
	Option A: Partially Measured Retrofit Isolation			
	kWh Saved	kW Saved	Therms Saved (Natural Gas)	kGals Saved (Water)
Old Mill Elementary School	277,573	1,160	(6,836)	37
Bernheim Middle School	0	0	0	0
Brooks Elementary School	104,659	630	269	123
Bullitt Alternative Center	171,416	644	-	77
Bullitt Central High School	25,745	128	-	-
Bullitt East High School	262,727	1,080	850	320
Bullitt Middle School	272,223	971	562	106
Cedar Grove Elementary School	125,794	484	-	120
Crossroads Elementary School	158,209	609	-	98
Eastside Middle School	537,514	809	-	81
Freedom Elementary School	158,837	1,008	(68)	104
Hebron Middle School	132,118	516	-	45
Lebanon Junction Elementary	114,375	447	-	69
Maintenance Building	518	-	-	4
Maryville Elementary School	-	-	424	75
Mount Washington Elementary School	1,048	-	514	83
Mount Washington Middle School	213,695	1,117	(126)	114
Nichols Elementary School	55,774	215	-	22
North Bullitt High School	257,056	910	417	83
Overdale Elementary School	92,144	348	488	83
Pleasant Grove Elementary	159,193	933	343	102
Riverview Opportunity Center	29,672	142	101	49
Roby Elementary School	197,744	668	-	51
Shepherdsville Elementary	189,909	974	(143)	78
Zoneton Middle School	191,416	694	-	81
Board of Education Office	40,100	200	89	25
Transportation Complex	79,697	209	-	9
	Option B: Retrofit Isolation (not used)			
	kWh Saved	kW Saved	Therms Saved	kGals Saved (water)

	Option C: Whole Facility (not used)			
	kWh Saved	kW Saved	Therms Saved	kGals Saved (water)
	Option D: Calibrated Simulation (not used)			
	kWh Saved	kW Saved	Therms Saved	kGals Saved (water)
<b>Grand Total Energy Savings Guarantee (annual)</b>	<b>3,849,154</b> <b>3,571,581</b>	<b>14,896</b> <b>13,737</b>	<b>(3,116)</b> <b>3,720</b>	<b>2,041</b> <b>2,004</b>

Due to rounding of numbers, some numbers in the table above may vary slightly from similar energy references within this Agreement.

**Section 4. Calculated Monetary Value of Energy Savings.** The monetary value of Energy Savings is derived by multiplying the applicable units of Energy Savings as outlined in Table 2 by the applicable Base Utility Rate as defined and described in Section 8. Table 3 sets forth the calculated monetary value of the Energy Savings Guarantee in the first Guarantee Year per building, ECM or ECM type for each M&V method.

**Table 3 – Calculated Monetary Value of Annual Energy Savings Per Building or ECM\***

Building or ECM (Exhibit ID#)	Guarantee Options				Total Energy Savings
	Option A Partially Measured Retrofit Isolation	Option B Retrofit Isolation	Option C Building or ECM (Exhibit ID#)	Option D Guarantee Options	
Old Mill Elementary	\$21,024				\$21,024
	\$0				\$0
Bernheim Middle School	\$11,535				\$11,535
Brooks Elementary	\$15,694				\$15,694
Bullitt Alternative Center	\$2,476				\$2,476
Bullitt Central High School	\$28,026				\$28,026
Bullitt East High School	\$24,668				\$24,668
Cedar Grove Elementary	\$13,210				\$13,210
Crossroads Elementary	\$18,299				\$18,299
Eastside Middle School	\$38,905				\$38,905
Freedom Elementary	\$25,732				\$25,732
Hebron Middle School	\$16,968				\$16,968
Lebanon Junction Elem.	\$10,868				\$10,868
Maintenance Building	\$106				\$106
Maryville Elementary School	\$895				\$895
Mount Washington Elementary	\$1,304				\$1,304
Mount Washington Middle	\$34,626				\$34,626
Nichols Elementary School	\$4,907				\$4,907
North Bullitt High School	\$31,218				\$31,218
Overdale Elementary	\$11,347				\$11,347
Pleasant Grove Elem	\$18,272				\$18,272
Riverview Opportunity Ctr.	\$3,413				\$3,413
Roby Elementary	\$17,746				\$17,746
Shepherdsville Elementary	\$30,228				\$30,228
Zoneton Middle School	\$21,798				\$21,798

Building or EOM (Exhibit ID)	Operational Savings				Total Energy Savings
	Partially Measured Potential Savings	Not Measured Potential Savings	Full Measured Potential Savings (Exhibit ID)	Guaranteed Savings	
Board of Education Office	\$4,419				\$4,419
Transportation Complex	\$6,735				\$6,735
<b>Total</b>	<b>\$414,424</b>				<b>\$414,424</b>
	<b>\$393,488</b>				<b>\$393,488</b>

Some of the dollar amounts in the table above may vary slightly from similar dollar amounts within this Agreement due to rounding.

**Section 5. Operational Savings.** Owner and Qualified Provider agree that, as a direct result of the Services, as of the Commencement Date, Owner shall achieve annual operational cost savings in the amounts set forth in Table 1 ("Operational Savings") during the Guarantee Term. Owner and Qualified Provider worked together to identify and quantify the Operational Savings based upon past and projected expenditure data provided by the Owner. Operational Savings may include the categories set forth below (as applicable).

- a. **Direct Cost Avoidance.** Reduction or elimination of costs or expenses in connection with existing or planned service contracts, materials, supplies, energy costs and labor expenditures. Direct cost avoidance Operational Savings may include savings achieved through a reduction in fuel and/or electricity rates ("Energy Rate Optimization Savings") by one or more of the following means:
  - (i) Improved rate from local electric utility company, natural gas company, or fuel company;
  - (ii) Direct purchase of natural gas or electricity; and/or
  - (iii) Bulk purchase of fuel.
- b. **Indirect Cost Avoidance.** Owner valuation, including such items as re-deployed labor resources and reduction in overhead; and
- c. **Capital Cost Avoidance.** Capital outlay funds expended by a local public agency or school district as defined in KRS 45A.345(2).

Throughout the Guarantee Term, Operational Savings (in the amounts set forth in Table 1) will be realized in each Guarantee Year and will be deemed to escalate at a rate of 2.5 percent (2.5%) per year as set forth in Table 1. The parties agree that the 2.5% escalation rate is a reasonable projection of future Operational Savings based upon past inflation experience, escalation in the cost of energy, goods and services experienced by Owner and the parties' expectations. The Operational Savings are detailed in the applicable sub-Exhibits. Operational Savings are stipulated by the parties and will not be measured, monitored or verified.

**Section 6. Installation Period Savings.** Energy Savings will accrue as the Services progress during the installation period until the Commencement Date. Qualified Provider will calculate and document such Energy Savings as they accrue in accordance with the sub-Exhibit(s) (such savings referred to as "Installation Period Savings").

**Section 7. Commencement Date and Guarantee Term.** The "Commencement Date" shall be the first calendar day of the month following the month in which the Date of Final Completion occurs, unless the Date of Final Completion falls on the first calendar day of a month, in which event the Commencement Date shall be the first calendar day of that month. The Energy Savings Guarantee shall begin as of the Commencement Date and, unless this Agreement shall terminate earlier, shall expire on the day immediately preceding the 20-year anniversary of the Commencement Date (hereinafter the "Guarantee Term").

**Section 8. Base Utility Rates.** The Base Utility Rates are the utility rates set forth below and are used to calculate the initial monetary value of Energy Savings. The Base Utility Rate shall be increased annually during the Guarantee Term by 4 percent (4.5%) per year, compounded annually (the "Adjusted Base Utility Rates"). The parties agree that such an adjustment is a reasonable projection of future increases in utility rates based on past inflation experience, applicable to utility rates and Owner's budgetary analysis. In calculating the monetary value of the Energy Savings for the purpose of the Energy Savings Guarantee reconciliation, Qualified Provider will use the greater of (i) the then current applicable utility rate unit cost and (ii) the Adjusted Base Utility Rates.

The following are the Base Utility Rates:

**Cost of Electricity**

**Table 4 Electric Rate Structure**

<b><u>Louisville Gas &amp; Electric – Rate: Power Service Secondary</u></b>	
SERVICE CHARGE, per month	\$ 90.00
ENERGY CHARGE For all kWh (includes fuel adjustment, environmental, and DSM charges)	\$ 0.03899
DEMAND CHARGE	
Per kW – Monthly Peak Winter Demand (includes adjustments)	\$ 21.12
Per kW – Monthly Peak Summer Demand (includes adjustments)	\$ 24.00
<b><u>Louisville Gas &amp; Electric – Rate: Power Service Secondary - Schools</u></b>	
SERVICE CHARGE, per month	\$ 90.00
ENERGY CHARGE For all kWh (includes fuel adjustment, environmental, and DSM charges)	\$ 0.03919
DEMAND CHARGE	
Per kW – Monthly Peak Winter Demand (includes adjustments)	\$ 17.82
Per kW – Monthly Peak Summer Demand (includes adjustments)	\$ 20.21
<b><u>Louisville Gas &amp; Electric – Rate: Time-of-Day Secondary Service - Schools</u></b>	
SERVICE CHARGE, per month	\$ 200.00
For all kWh (includes fuel adjustment, environmental, and DSM charges)	\$ 0.03895
DEMAND CHARGE (maximum load charge per kW per demand period, includes adjustments)	
Base Demand Period	\$ 5.15
Intermediate Demand Period	\$ 5.70
Peak Demand Period	\$ 7.32
Demand Billing Period Hours (May Through September)	
Base:	All hours
Intermediate:	10 A.M. – 10 P.M.

**Table 4 (continued) Electric Rate Structure**

Peak:	1 P.M. – 7 P.M.
(October Through April)	
Base:	All hours
Intermediate:	6 A.M. – 10 P.M.
Peak:	6 A.M. – 12 Noon
<b><u>Louisville Gas &amp; Electric – Rate: General Service - 3 Phase</u></b>	
SERVICE CHARGE, per month	\$ 50.40
ENERGY CHARGE For all kWh (includes fuel adjustment, environmental, and DSM charges)	\$ 0.11022
<b><u>Salt River Electric – Rate: LLP-1</u></b>	
ENERGY CHARGE For all kWh (includes fuel adjustment, environmental charges)	\$ 0.06383
DEMAND CHARGE Per kW – Monthly Peak Demand (includes adjustments)	\$ 7.33
<b><u>Salt River Electric – Rate: LLP-2</u></b>	
ENERGY CHARGE For all kWh (includes fuel adjustment, environmental charges)	\$ 0.05967
DEMAND CHARGE Per kW – Monthly Peak Demand (includes adjustments)	\$ 7.33
<b><u>Salt River Electric – Rate: B-2 Commercial</u></b>	
ENERGY CHARGE For all kWh (includes fuel adjustment, environmental charges)	\$ 0.08650

**Cost of Fuel(s)**

**Table 4.1. Gas Rate Structure**

<b><u>Natural Gas Rate Structure – Louisville Gas &amp; Electric</u></b>	
January through December: <b>All therms (\$/therms)</b>	\$ 0.65

**Cost of Water/Sewer**

**Table 4.2**

Facility	Water Rate (\$/kGal)*	Sewer Rate (\$/kGal)*
Bernheim MS	\$4.0300	N/A
Brooks ES	\$3.8086	\$5.8800
Bullitt Central HS	\$3.8086	\$8.3114
Bullitt East HS	\$4.4350	\$4.4350
Cedar Grove ES	\$3.8086	\$9.8314
Crossroads ES	\$5.4000	\$5.4000
Eastside MS	\$5.5600	\$5.5600
Freedom ES	\$3.6300	N/A
Hebron MS	\$3.9600	N/A
Lebanon Junction ES	\$2.2240	\$1.9360
Maryville ES	\$3.8086	\$4.4314
Mount Washington ES	\$5.4400	\$5.4400
Mount Washington MS	\$5.1550	\$5.1550
Nichols ES	\$3.8086	N/A
North Bullitt HS	\$4.7100	N/A
Old Mill ES	\$4.5750	\$4.5750
Overdale ES	\$3.8086	\$5.8800
Pleasant Grove ES	\$5.1550	\$5.1550
Roby ES	\$4.4600	N/A
Shepherdsville ES	\$3.8086	\$8.3014
Zoneton MS	\$3.8086	\$4.8514
Board Office	\$3.8086	\$9.6014
Maintenamce Building	\$3.8086	\$9.9614
Riverview Opportunity Center	\$3.8086	\$7.2114
Transportation Dept./Bus Garage	\$3.8100	\$3.15

*\*Rates are based on average usage from previous year per facility and most up-to-date rates posted by Louisville Water Company, Louisville MSD, Mt. Washington Water & Sewer, and Lebanon Junction Water Works*

**Section 9. Building Operation.** The following operational parameters were collaboratively agreed upon by Owner and Qualified Provider and form the basis for calculating Energy Savings. Owner bears the risk of decreased Energy Savings if the facilities are operated outside of these operational parameters. Variation from these parameters will permit Qualified Provider to make an adjustment to the Baseline as indicated in Exhibit F, Section 2.

**Table 5.1 – Operational Hours: Old Mill Elementary School**

Area	Weekdays	Weekends
Classrooms, Media Center, Gym, Cafeteria – January thru May	Occupied Hrs: 6am – 4pm Unoccupied Hrs: 4pm – 6am	Unoccupied: All Hours Except for Special Events / Games
Classrooms, Media Center, Gym, Cafeteria – June thru July	Occupied Hrs: 6am – 3pm Unoccupied Hrs: 3pm – 6am	Unoccupied: All Hours Except for Special Events / Games
Classrooms, Media Center, Gym, Cafeteria – August thru December	Occupied Hrs: 6am – 4pm Unoccupied Hrs: 6pm – 6am	Unoccupied: All Hours Except for Special Events / Games
Offices – All Year	Occupied Hrs: 6am – 6pm Unoccupied Hrs: 6pm – 6am	Unoccupied: All Hours – Except for Special Events / Games
Offices – June thru July	Occupied Hrs: 7am – 6pm Unoccupied Hrs: 6pm – 6am	Unoccupied: All Hours – Except for Special Events / Games
Offices – August thru December	Occupied Hrs: 6am – 6pm Unoccupied Hrs: 6pm – 6am	Unoccupied: All Hours – Except for Special Events / Games
Kitchen – January thru May	Occupied Hrs: 6am – 3pm Unoccupied Hrs: 3pm – 6am	Unoccupied: All Hours
Kitchen – June thru July	Occupied Hrs: 6am – 2pm Unoccupied Hrs: 2pm – 6am	Unoccupied: All Hours
Kitchen – August thru December	Occupied Hrs: 6am – 3pm Unoccupied Hrs: 3pm – 6am	Unoccupied: All Hours

**Table 5.2 – Operational Parameters: Old Mill Elementary School**

Area	Room Temperatures (within $\pm 2^{\circ}$ F)
All Areas – January thru March	Occupied Cooling: 73° F Unoccupied Cooling: 75° F Occupied Heating: 72° F Unoccupied Heating: 65° F
All Areas – April thru May	Occupied Cooling: 71° F Unoccupied Cooling: 75° F Occupied Heating: 69° F Unoccupied Heating: 65° F
All Areas – June thru July	Occupied Cooling: 71° F Unoccupied Cooling: 75° F Occupied Heating: 69° F Unoccupied Heating: 65° F
All Areas – August thru October	Occupied Cooling: 71° F Unoccupied Cooling: 75° F Occupied Heating: 69° F Unoccupied Heating: 65° F
All Areas – November thru December	Occupied Cooling: 73° F Unoccupied Cooling: 75° F Occupied Heating: 72° F Unoccupied Heating: 65° F

*Owner is responsible to perform the updates to the controls system to conform to the above table*



**Section 10. Guarantee Reconciliation. (See Exhibit F, Section 1)**

**Section 11. Adjustments to Baseline. (See Exhibit F, Section 2)**

**Section 12. Owner Responsibilities:** Owner acknowledges that it has an integral role in achieving Energy Savings and agrees to perform the following responsibilities:

- a. Properly maintain, repair, and replace all energy consuming equipment with equipment of equal or better energy and operational efficiencies and promptly notify Qualified Provider of the repair and /or replacement, but no later than within fourteen (14) calendar days from the commencement thereof;
- b. Make available to Qualified Provider upon its request copies of maintenance records and procedures regarding maintenance of the Premises;
- c. Promptly provide Qualified Provider with notice of system and building alterations at the Premises that impact energy consumption, including but not limited to: energy management systems, automatic door operation, structural, occupancy sensors, photocell/timer control of exterior lighting and heat recovery systems;
- d. Log any utility meters and the operation of any energy consuming devices or equipment as directed by Qualified Provider and furnish copies of such logs to Qualified Provider within thirty (30) calendar days after preparation of the logs;
- e. Provide to Qualified Provider true, accurate and complete copies of all energy related bills within ten (10) days after Owner's receipt of such bills. The parties stipulate that, in each event that Owner fails to provide an energy related bill within thirty (30) days after the end of the Billing Period to which the bill relates, Owner shall be deemed to have realized that portion of the Total Energy Savings prorated for the utility billing period to which said energy related bill relates and for such subsequent utility billing periods as are affected by an increase in energy and/or demand use that could have been avoided had Qualified Provider been provided with the energy related bill in a timely manner. In the event Qualified Provider subsequently receives or obtains the untimely energy related bill and such bill discloses that savings were achieved in an amount greater than had been stipulated hereunder, such greater savings will be used in calculating Actual Savings;
- f. Provide to Qualified Provider true, accurate and complete descriptions of all energy consuming devices within seven (7) days after installation and start up of such equipment. This equipment includes, but is not limited to heating, cooling or ventilating equipment, computers and other electronics, water heaters, kitchen equipment, laundry equipment, mobile trailer units, portable hospital equipment. The parties stipulate that, in each event that Owner fails to provide this information within thirty (30) days after the start up of such equipment, Owner shall be deemed to have realized that portion of the Energy Savings prorated for the utility billing period to which said energy related bill relates and for such subsequent utility billing periods as are affected by an increase in energy and/or demand use that could have been avoided had Qualified Provider been provided with the energy related information in a timely manner. In the event Qualified Provider subsequently receives or obtains the untimely energy related bill and such bill discloses that savings were achieved in an amount greater than had been stipulated hereunder, such greater savings will be used in calculating Actual Savings;
- g. Furnish to Qualified Provider true, accurate and complete copies of any utility rate schedules or tariffs promptly upon Qualified Provider's request for the same and, in any event, within thirty (30) calendar days after Owner's receipt of notice of a utility rate change;
- h. Maintain in effect and fully perform its maintenance obligations throughout the duration of the Guarantee Term; and

- i. During the Term of the Agreement, permit only Qualified Provider and/or Owner approved personnel to repair, adjust or program equipment, systems, and/or controls covered by this Agreement or affecting equipment, systems, and/or controls covered by this Agreement, except in the event of an emergency, in which event Owner shall immediately notify Qualified Provider of the existence of the emergency no later than within twenty-four (24) hours of the commencement of the emergency condition.

**Section 13. Exclusions from Qualified Provider's Responsibilities:** Qualified Provider shall not be responsible for any of the following:

- a. Any shortfalls in Energy Savings, failure to satisfy the Energy Savings Guarantee, or for loss, damage or malfunction to equipment, systems, controls or building(s) structures resulting from non-Qualified Provider personnel examining, adjusting or repairing equipment, systems, or controls;
- b. Any failure of Owner to achieve or realize Operational Savings;
- c. Any damage or malfunction resulting from freezing, corrosion or erosion on the water side of the equipment or caused by scale or sludge on equipment;
- d. Problems or damages caused by utility service or damage sustained by equipment or systems;
- e. Furnishing any items of equipment, material, or labor, or performing tests recommended or required by insurance companies or federal, state, or local governments; and
- f. Failure or inadequacy of any structure or foundation supporting or surrounding equipment or work or any portion thereof.

**Section 14. Independent Audit. (See Exhibit F, Section 3)**

**EXHIBIT E.27 – Amended February 1, 2024**  
**Guarantee**  
**Installation of New Natural Gas Booster Heater for Dishwashers – Multiple Facilities**

**1.0 Agreed Upon Parameters:**

The following are mutually agreed upon parameters that form the basis of this Energy Savings Guarantee.

a) Applicability:

This Energy Savings Guarantee applies to the energy conservation measure involving the replacement of existing electric booster heater with a new gas booster heater for the dishwashers in multiple facilities at Bullitt County Public Schools.

b) Annual Hours of Operation:

For the purposes of this agreement, the annual hours of operation of the existing booster heaters are dependent on the hours of operation of the facility. The Owner and Qualified Provider collaboratively agreed upon its assumptions and results throughout the process

c) Existing Equipment:

Field survey has determined the power and duty cycle for the existing equipment, which is provided in the table below:

**Table 1**

Electric Dishwasher Booster Heater Location	Qty	Power	Efficiency	Operation
Bernheim MS	1	15 kw	95%	6am-7am and 11am-1pm Mon-Fri
Freedom ES	1	39 kw	95%	6am-7am and 11am-1pm Mon-Fri
Mount Washington MS	1	36 kw	95%	6am-7am and 11am-1pm Mon-Fri
Old Mill ES	4	36 kw	95%	6am-7am and 11am-1pm Mon-Fri
Pleasant Grove ES	1	36 kw	95%	6am-7am and 11am-1pm Mon-Fri
Shepherdsville ES	1	39 kw	95%	6am-7am and 11am-1pm Mon-Fri

*Note: The dishwasher is not used during the months of June and July*

These values form the basis of the pre-retrofit condition and are used in the calculations to recreate the existing energy profile associated with their operation. The values in the Table are mutually agreed to by Owner and Qualified Provider for the purposes of this Agreement.

## 2.0 Pre-Retrofit Consumption Data:

The pre-retrofit consumption data was established utilizing the following methodology agreed to by Owner and Qualified Provider.

a) Measurement Methodology:

A spreadsheet calculation was used to determine the energy consumption of the booster heaters for each location. Known parameters such as booster heater power consumption, hours of operation, and efficiency were utilized in the modeling of the base case. Qualified Provider based this estimate on extensive survey and analysis. Its assumptions and results were collaboratively agreed upon by Owner and Qualified Provider throughout the process.

## 3.0 Post-Retrofit Measurements:

The following describes the agreed to methodology for proving the efficiency of the new equipment installed at Bullit County Public Schools

a) Measurement Methodology:

Qualified Provider has completed an engineering analysis for this conservation measure utilizing a spreadsheet calculation. The bulk of savings due to this conservation measure are related to installing new natural gas fueled equipment that significantly reduces the electric charges to the building in the form of electric demand and electric energy. The nominal capacity of the new equipment will be equivalent to the existing electric booster heaters to be replaced.

Since all external variables (booster heater power consumption, hours of operation, efficiency and utility rates.) have been established, the remaining items to validate are that the true efficiency of the new equipment matches that listed below in Table 2. To accomplish this, the equipment manufacturer will provide a certified analysis from the proper rating agencies or the efficiency of the equipment will be measured by Qualified Provider after installation.

**Table 2**

New Equipment	Qty	Efficiency	Operation
Bernheim MS	1	90%	6am-7am and 11am-1pm Mon-Fri
Freedom ES	1	90%	6am-7am and 11am-1pm Mon-Fri
Mount Washington MS	1	90%	6am-7am and 11am-1pm Mon-Fri
Old Mill ES	4	90%	6am-7am and 11am-1pm Mon-Fri
Pleasant Grove ES	1	90%	6am-7am and 11am-1pm Mon-Fri
Shepherdsville ES	1	90%	6am-7am and 11am-1pm Mon-Fri

#### 4.0 Computation and Presentation of Savings:

The following describes the agreed-to methodology for computing Energy Use Savings based on installation of the new equipment at Bullitt County Public Schools.

a) Computation of Energy Use Savings:

Once the new equipment efficiency is certified or measured, actual annual Energy Use Savings will be calculated. To accomplish this, Qualified Provider will enter the certified or measured efficiency of the new equipment into the spreadsheet analysis tool previously used to calculate savings based on the projected (future) operation. The energy calculation will only be rerun if the efficiency is less than the efficiency noted below in the Minimum Efficiency Threshold.

**Table 3**

Equipment	Tested Efficiency being provided (as noted in Section 3.0)	Minimum Efficiency Threshold
Gas Dishwasher Booster Heater	90%	85%

If the tested efficiency is greater than or equal to the minimum efficiency threshold noted in Table 3 above, the efficiency is within an acceptable tolerance based on Qualified Provider's conservative safety factors for this energy conservation measure, and therefore satisfies the Energy Savings Guarantee.

**Table 4a Energy Use - Existing Electric vs New Natural Gas Booster Heater**

Building	Electric Booster Heater (kW)	Annual Hours of Operation	Load Factor	Electric Heater Efficiency	Electric Energy Consumption (kWh)	New Natural Gas Heater Efficiency	Natural Gas Consumption (therms)
Bullitt MS	15	600	70%	95%	6,632	90%	239
Freedom ES	39	600	70%	95%	17,242	90%	621
Mount Washington MS	36	600	70%	95%	15,916	90%	573
Oxley MS	36	600	70%	95%	15,916	90%	573
Pleasant Grove ES	36	600	70%	95%	15,916	90%	573
Shepherdville ES	39	600	70%	95%	17,242	90%	621
Total					88,863		3,201
					72,947		2,628

**Table 4b Summary of Calculated and Guaranteed Energy and Demand Savings**

Building	Calculated Demand Savings (kW)	Guaranteed Demand Savings (kW)	Calculated Electric Energy Savings (kWh)	Guaranteed Electric Energy Savings (kWh)	Calculated Natural Gas Savings (therms)	Guaranteed Natural Gas Savings (therms)
Bullitt MS	150	135	6,632	5,968	(239)	(263)
Freedom ES	390	351	17,242	15,518	(621)	(683)
Mount Washington MS	360	324	15,916	14,324	(573)	(631)
Oxley MS	360	324	15,916	14,324	(573)	(631)
Pleasant Grove ES	360	324	15,916	14,324	(573)	(631)
Shepherdville ES	390	351	17,242	15,518	(621)	(683)
Total	2,010	1,809	88,863	79,977	(3,201)	(3,522)
	1,650	1,485	72,947	65,653	(2,628)	(2,891)

b) Presentation of Energy Use Savings:

The energy conservation measure described herein will result in the following effect on energy usage:

Bernheim MS - Total Annual Guaranteed kWh Savings:	5,968 kWh
Bernheim MS - Total Annual Guaranteed kW Savings:	135 kW
Bernheim MS - Total Annual Guaranteed Therm Savings:	-263 Therms

Freedom ES - Total Annual Guaranteed kWh Savings:	15,518 kWh
Freedom ES - Total Annual Guaranteed kW Savings:	351 kW
Freedom ES - Total Annual Guaranteed Therm Savings:	-683 Therms

Mt. Washington MS - Total Annual Guaranteed kWh Savings:	14,324 kWh
Mt. Washington MS - Total Annual Guaranteed kW Savings:	324 kW
Mt. Washington MS - Total Annual Guaranteed Therm Savings:	-631 Therms

<del>Old Mill ES - Total Annual Guaranteed kWh Savings:</del>	<del>14,324 kWh</del>
<del>Old Mill ES - Total Annual Guaranteed kW Savings:</del>	<del>324 kW</del>
<del>Old Mill ES - Total Annual Guaranteed Therm Savings:</del>	<del>631 Therms</del>

Pleasant Grove ES - Total Annual Guaranteed kWh Savings:	14,324 kWh
Pleasant Grove ES - Total Annual Guaranteed kW Savings:	324 kW
Pleasant Grove ES - Total Annual Guaranteed Therm Savings:	-631 Therms

Shepherdsville ES - Total Annual Guaranteed kWh Savings:	14,324 kWh
Shepherdsville ES - Total Annual Guaranteed kW Savings:	324 kW
Shepherdsville ES - Total Annual Guaranteed Therm Savings:	-631 Therms

**EXHIBIT E.28 – Amended February 1, 2024**  
**Guarantee**  
**Water Conservation Retrofit – Multiple Facilities**

**1.0 Agreed Upon Parameters:**

*The following are mutually agreed upon parameters that form the basis of this Energy Savings Guarantee. These parameters are hereby stipulated for the purposes of this Agreement as fact and will not be measured, monitored or adjusted.*

a) Applicability:

This performance guarantee applies to the water conservation retrofit measures installed by Qualified Provider in Bullitt County Public Schools.

**2.0 Pre-Retrofit Consumption Data:**

*The following describes the methodology for proving per-fixture water consumption of each existing fixture prior to the installation of the water conservation retrofit. Actual water consumption measurements are taken to validate the pre-retrofit, per-fixture consumption as represented in the water consumption audits and analyses performed to date.*

a) Measurement Methodology:

Qualified Provider has proposed to retrofit existing plumbing fixtures with more efficient products. The purpose of this section is to validate the water consumption assumed in these estimates through actual measurement.

Several different types of existing fixtures were encountered during the detailed survey. The tables in Section 2.0.b lists fixture types, pre-retrofit consumption, and notes the quantity of each fixture.

In order to validate the water consumption estimates of the existing fixtures, Qualified Provider will measure the actual water consumed by a sample of each fixture. Appropriate representatives of Owner should be present to witness the measurement. A sufficient number of fixtures, not to exceed five (5) typical fixtures, will be measured for water consumption so that an accurate representation (average of the measurements) has been established. The cost of this measurement and the responsibility for the provision of a qualified technician will be borne entirely by Qualified Provider. It is anticipated that a sufficient representative sample of each retrofit type will be measured and documented prior to the retrofit installation being completed.

b) Pre-Retrofit Fixture Table:

For the purposes of this Agreement, the plumbing fixture quantities were surveyed by Qualified Provider and its consultant and these quantities are collaboratively agreed upon by the Owner and Qualified Provider and are stipulated in this Section 2.0 of Exhibit E.28.

Qualified Provider reserves the right to adjust the baseline for the pre- and post-retrofit quantities to reflect actual quantities and types of fixtures encountered during the retrofit; however, the energy use savings expected to be achieved will not be less than the energy use savings represented by the difference in consumption between the fixtures and quantities in the pre-retrofit table in this Section 2.0 of this Exhibit E.28 and the post-retrofit table in Section 3.0 of this Exhibit E.28.

The following tables illustrate the pre-retrofit (existing) fixtures and for the purposes of this agreement are stipulated and hereby collaboratively agreed to by the Owner and Qualified Provider:

**Table 1a**

Fixture Type	Pre-Retrofit Flow (gpm)	Qty		
Std 4 & 8 inch Hot and Cold	2.00	7		
Push Button Delay Spigot	2.00	18		
General Purpose Sinks	2.20	1		
Fixture Type	Pre-Retrofit Flow (gpd)	Qty		
Urinals (capable of 1.0 diaphragm)	1.50	10		
Pre-Retrofit Usage				
Fixture Type	(gpm)	(gpd/day)	(days/yr)	Qty
Med Hand Sinks	2.2	15	190	1
Hand Wash / Food Svc Hand	2.2	15	190	1
Food Svc Rest Room	2.2	15	190	1
Food Svc Prep Sinks	4.0	20	190	1
Food Svc Pot Wash	4.0	20	190	2
Miscellaneous	Pre-Retrofit Flow (gpm)	Pre-Retrofit Energy Use (MMBtu/yr)	Qty	
Dish Washer	3.20	48.68	1	

**Table 1b**

Fixture Type	Pre-Retrofit Flow (gpm)	Qty
Std 4 & 8 inch Hot and Cold	2.08	6
General Purpose Sinks	2.10	2
Fixture Type	Pre-Retrofit Flow (gpd)	Qty
Urinals (capable of 0.5 diaphragm)	1.50	1

**Table 1c**

Fixture Type	Pre-Retrofit Flow (gpm)	Qty		
General Purpose Sinks	2.20	1		
Pre-Retrofit Usage				
Fixture Type	(gpm)	(mln/day)	(days/yr)	Qty
Hand Wash / Food Svc Hand	2.2	30	190	1
Food Svc Prep Sinks	4.0	60	190	2
Food Svc Pot Wash	4.0	60	190	1



**Table 1d**

Fixture Type	Pre-Retrofit Flow (gpm)		Qty	
Std 4 & 8 inch Hot and Cold	1.50		32	
General Purpose Sinks	2.00		3	
Fixture Type	Pre-Retrofit Flow (gpi)		Qty	
Urinals (capable of 0.5 diaphragm)	1.50		2	
Urinals (capable of 1.0 diaphragm)	1.50		2	
Urinals	1.00		25	
Pre-Retrofit Usage				
Fixture Type	(gpm)	(min/day)	(days/yr)	Qty
Food Svc Prep Sinks	4.0	90	190	1
Food Svc Pot Wash	4.0	90	190	1
Pre-Retrofit Energy				
Miscellaneous	Pre-Retrofit Flow (kgal/yr)	Pre-Retrofit Energy Use (MM Btu/yr)		Qty
Ice Machine (small-medium)	19.50	19.27		1

**Table 1e**

Fixture Type	Pre-Retrofit Flow (gpm)		Qty	
Std 4 & 8 inch Hot and Cold	1.93		4	
Single Spigot, cold only	2.12		9	
Push Button Delay Spigot	1.50		2	
Fixture Type	Pre-Retrofit Flow (gpi)		Qty	
Urinals	1.00		18	
Urinals	1.50		4	
Pre-Retrofit Usage				
Fixture Type	(gpm)	(min/day)	(days/yr)	Qty
Food Svc Rest Room	2.2	30	190	1
Food Svc Pot Wash	4.0	60	190	3

**Table 1f**

Fixture Type	Pre-Retrofit Flow (gpm)		Qty
Std 4 & 8 inch Hot and Cold	2.20		3
General Purpose Sinks	2.20		1

**Table 1g**

Fixture Type	Pre-Retrofit Flow (gpm)		Qty	
Std 4 & 8 inch Hot and Cold	2.00		2	
Push Button Delay Spigot	1.75		8	
General Purpose Sinks	2.20		4	
Fixture Type	Pre-Retrofit Flow (gpi)		Qty	
Urinals (capable of 0.5 diaphragm)	1.50		2	
Urinals	1.00		8	
Pre-Retrofit Usage				
Fixture Type	(gpm)	(min/day)	(days/yr)	Qty
Med Hand Sinks	2.2	30	190	1
Food Svc Pot Wash	4.0	60	190	2

**Table 1h**

Fixture Type	Pre-Retrofit Flow (gpm)	Qty		
Std 4 & 8 inch Hot and Cold	2.00	6		
Push Button Delay Spigot	1.50	29		
General Purpose Sinks	2.00	28		
Push Button Delay Spigot	2.00	2		
Fixture Type	Pre-Retrofit Flow (gpd)		Qty	
Urinals	1.00		17	
Fixture Type	Pre-Retrofit Usage			Qty
	(gpm)	(min/day)	(days/yr)	
Hand Wash / Food Svc Hand	2.2	20	190	1
Food Svc Prep Sinks	4.0	45	190	2
Miscellaneous	Pre-Retrofit Flow (kgal/yr)	Pre-Retrofit Energy Use (MMBtu/yr)		Qty
Ice Machine (small-medium)	19.50	19.27		1

**Table 1i**

Fixture Type	Pre-Retrofit Usage			Qty
	(gpm)	(min/day)	(days/yr)	
Med Hand Sinks	2.2	30	190	1
Hand Wash / Food Svc Hand	2.2	30	190	2
Food Svc Rest Room	2.2	30	190	1
Food Svc Pot Wash	4.0	90	190	1
Miscellaneous	Pre-Retrofit Flow	Pre-Retrofit Energy Use (MMBtu/yr)		Qty
Kitchen Pre Rinse Sprayer (high flow)	2.00 gpm	11.26		5
Ice Machine (small-medium)	19.5 kgal/yr	19.27		1

**Table 1j**

Fixture Type	Pre-Retrofit Flow (gpm)	Qty		
General Purpose Sinks	2.50	4		
Fixture Type	Pre-Retrofit Usage		Qty	
	(gpm)	(min/day)	(days/yr)	
Med Hand Sinks	2.2	30	190	1
Hand Wash / Food Svc Hand	2.2	30	190	1
Food Svc Rest Room	2.2	30	190	1
Food Svc Prep Sinks	4.0	60	190	1
Food Svc Pot Wash	4.0	60	190	2

**Table 1k**

Fixture Type	Pre-Retrofit Usage			Qty
	(gpm)	(min/day)	(days/yr)	
Med Hand Sinks	2.2	30	190	1
Food Svc Pot Wash	4.0	90	190	1
Miscellaneous	Pre-Retrofit Flow	Pre-Retrofit Energy Use (MMBtu/yr)		Qty
Kitchen Pre Rinse Sprayer (high flow)	2.50 gpm	2.81		1
Ice Machine (small-medium)	19.5 kgal/yr	19.27		1

**Table 1l**

Fixture Type	Pre-Retrofit Flow (gpm)		Qty	
Std 4 & 8 inch Hot and Cold	1.50		1	
Push Button Delay Spigot	2.00		3	
General Purpose Sinks	2.00		12	
Lab Sink - Hot and Cold	2.20		3	
Fixture Type	Pre-Retrofit Flow (gpi)		Qty	
Urinals (capable of 0.5 diaphragm)	1.50		2	
Urinals	1.00		6	
Pre-Retrofit Usage				
Fixture Type	(gpm)	(min/day)	(days/yr)	Qty
Med Hand Sinks	2.2	30	190	1
Food Svc Pot Wash	4.0	60	190	2
Pre-Retrofit Energy Use (MMBtu/yr)				
Miscellaneous	Pre-Retrofit Flow (gpm)	Pre-Retrofit Energy Use (MMBtu/yr)	Qty	
Ice Machine (small-medium)	19.50	19.27	1	

**Table 1m**

Fixture Type	Pre-Retrofit flow (gpm)	Qty
Std 4 & 8 inch Hot and Cold	2.00	4

**Table 1n**

Fixture Type	Pre-Retrofit Flow (gpm)		Qty	
Lab Sink - Hot and Cold	2.00		1	
Pre-Retrofit Usage				
Fixture Type	(gpm)	(min/day)	(days/yr)	Qty
Hand Wash / Food Svc Hand	2.2	30	190	3
Food Svc Rest Room	2.2	30	190	1
Food Svc Prep Sinks	4.0	45	190	1
Food Svc Pot Wash	4.0	30	190	2

**Table 1o**

Fixture Type	Pre-Retrofit Flow (gpm)		Qty	
Std 4 & 8 inch Hot and Cold	2.00		28	
Lab Sink - Hot and Cold	2.20		2	
Fixture Type	Pre-Retrofit Flow (gpi)		Qty	
Urinals (capable of .5 diaphragm)	1.50		11	
Pre-Retrofit Usage				
Fixture Type	(gpm)	(min/day)	(days/yr)	Qty
Med Hand Sinks	2.2	15	190	2
Hand Wash / Food Svc Hand	2.2	15	190	1
Food Svc Rest Room	2.2	15	190	1
Food Svc Pot Wash	4.0	30	190	3

**Table 1p**

Fixture Type	Pre-Retrofit Usage			Qty
	(gpm)	(min/day)	(days/yr)	
Hand Wash / Food Svc Hand	2.2	20	190	3
Food Svc Prep Sinks	4.0	60	190	1
Food Svc Pot Wash	4.0	60	190	2
Miscellaneous	Pre-Retrofit Flow (kgal/yr)	Pre-Retrofit Energy Use (MMBtu/yr)		Qty
Ice Machine (small-medium)	19.50	19.27		1

**Table 1q**

Fixture Type	Pre-Retrofit Usage			Qty
	(gpm)	(min/day)	(days/yr)	
Food Svc Pot Wash	4.0	60	190	1

**Table 1r**

Fixture Type	Pre-Retrofit Usage			Qty
	(gpm)	(min/day)	(days/yr)	
Hand Wash / Food Svc Hand	2.2	30	190	1
Food Svc Rest Room	2.2	30	190	1
Food Svc Prep Sinks	4.0	60	190	3
Miscellaneous	Pre-Retrofit Flow (kgal/yr)	Pre-Retrofit Energy Use (MMBtu/yr)		Qty
Ice Machine (small-medium)	19.50	19.27		1

**Table 1s**

Fixture Type	Pre-Retrofit Flow (gpm)	Qty		
Std 4 & 8 inch Hot and Cold	1.50	16		
Single Spigot, cold only	2.00	1		
Push Button Delay Spigot	2.00	2		
General Purpose Sinks	2.00	7		
General Purpose & Single Spigot, cold only	2.20	28		
Fixture Type	Pre-Retrofit Flow (gpd)	Qty		
Urinals (capable of 1.0 diaphragm)	1.50	9		
Urinals	1.00	2		
Fixture Type	Pre-Retrofit Usage		Qty	
	(gpm)	(min/day)	(days/yr)	
Med Hand Sinks	2.2	10	190	1
Hand Wash / Food Svc Hand	2.2	10	190	1
Food Svc Rest Room	2.2	10	190	1
Food Svc Prep Sinks	4.0	10	190	1
Food Svc Pot Wash	4.0	10	190	2

**Table 1t**

Fixture Type	Pre-Retrofit Flow (gpm)			Qty
General Purpose Sinks	2.00			1
Fixture Type	Pre-Retrofit Usage			Qty
	(gpm)	(min/day)	(days/yr)	
Hand Wash / Food Svc Hand	2.2	20	190	3
Food Svc Rest Room	2.2	30	190	1
Food Svc Prep Sinks	4.0	60	190	1
Food Svc Pot Wash	4.0	45	190	2
Miscellaneous	Pre-Retrofit Flow (kgal/yr)	Pre-Retrofit Energy Use (MMBtu/yr)		Qty
Ice Machine (small-medium)	19.50	19.27		1

**Table 1u**

Fixture Type	Pre-Retrofit Usage			Qty
	(gpm)	(min/day)	(days/yr)	
Med Hand Sinks	2.2	30	190	1
Hand Wash / Food Svc Hand	2.2	30	190	2
Food Svc Rest Room	2.2	30	190	1
Food Svc Prep Sinks	4.0	60	190	1
Food Svc Pot Wash	4.0	60	190	2

**Table 1v**

Fixture Type	Pre-Retrofit Flow (gpm)			Qty
Std 4 & 8 inch Hot and Cold	2.00			4
Push Button Delay Spigot	2.10			4
General Purpose Sinks	2.00			4
Fixture Type	Pre-Retrofit Flow (gpf)			Qty
Urinals	1.00			6
Fixture Type	Pre-Retrofit Usage			Qty
	(gpm)	(min/day)	(days/yr)	
Med Hand Sinks	2.2	15	190	1
Hand Wash / Food Svc Hand	2.2	15	190	2
Food Svc Rest Room	2.2	15	190	1
Food Svc Pot Wash	4.0	15	190	2

**Table 1w**

Fixture Type	Pre-Retrofit Usage			Qty
	(gpm)	(min/day)	(day/yr)	
Push Button Delay Spigot	2.00			2
Med Hand Sinks	2.2	30	190	1
Food Svc Pot Wash	4.0	90	190	1
Miscellaneous	Pre-Retrofit Flow	Pre-Retrofit Energy Use (MMBtu/yr)		Qty
Kitchen Pre Rinse Sprayer (high flow)	2.00 gpm	6.76		3
Ice Machine (small-medium)	19.5 kgal/yr	19.27		1

**Table 1x**

Fixture Type	Pre-Retrofit Usage			Qty
	(gpm)	(min/day)	(day/yr)	
Med Hand Sinks	2.2	30	190	1
Hand Wash / Food Svc Hand	2.2	30	190	1
Food Svc Rest Room	2.2	30	190	1
Food Svc Pot Wash	4.0	60	190	2
Miscellaneous	Pre-Retrofit Flow (gpm)	Pre-Retrofit Energy Use (MMBtu/yr)		Qty
Kitchen Pre Rinse Sprayer (high flow)	2.50	7.13		1

**Table 1y**

Fixture Type	Pre-Retrofit Usage			Qty
	(gpm)	(min/day)	(day/yr)	
Med Hand Sinks	2.2	30	190	1
Hand Wash / Food Svc Hand	2.2	30	190	2
Food Svc Rest Room	2.2	30	190	1
Food Svc Pot Wash	4.0	90	190	1
Miscellaneous	Pre-Retrofit Flow	Pre-Retrofit Energy Use (MMBtu/yr)		Qty
Kitchen Pre Rinse Sprayer (high flow)	2.00 gpm	11.26		5
Ice Machine (small-medium)	19.5 kgal/yr	19.27		1

### 3.0 Post-Retrofit Measurements:

The following describes the methodology for proving per-fixture water consumption reductions as a result of the installation of the more efficient retrofit equipment. Actual consumption measurements are taken to validate the post-retrofit, per-fixture consumption as represented in the audits and analyses performed to date.

a) Measurement Methodology:

Qualified Provider has proposed to retrofit existing plumbing fixtures with energy efficient products. The detailed survey/scope of work incorporated herein, illustrates the types of retrofits installed, and *estimates* the consumption of the retrofits. The purpose of this section is to validate these estimates through actual consumption measurement.

The table in this Section 3.0.b of this Exhibit E.28 lists fixture types, post-retrofit consumption, and quantity of each retrofit.

In order to validate the water consumption estimates of the existing fixtures, Qualified Provider will measure the actual water consumed by a sample of each fixture. Appropriate representatives of Owner should be present to witness the measurement. A sufficient number of fixtures, not to exceed five (5) typical fixtures, will be measured for water consumption so that an accurate representation (average of the measurements) has been established. The cost of this measurement and the responsibility for the provision of a qualified technician will be borne entirely by Qualified Provider. It is anticipated that a sufficient representative sample of each retrofit type will be measured and documented after the retrofit installation has been completed.

b) Post-Retrofit Fixture Table:

The following table illustrates the post-retrofit (proposed) fixtures:

**Table 2a**

Fixture Type	Post-Retrofit Flow (gpm)			Qty
Std 4 & 8 inch Hot and Cold	0.50			7
Push Button Delay Spigot	0.50			18
General Purpose Sinks	1.50			1
Fixture Type	Post-Retrofit Flow (gph)			Qty
Urinals (capable of 1.0 diaphragm)	0.13			10
Fixture Type	Post-Retrofit Usage			Qty
	(gpm)	(min/day)	(days/yr)	
Med Hand Sinks	2.2	5	190	1
Hand Wash / Food Svc Hand	2.2	5	190	1
Food Svc Rest Room	2.2	5	190	1
Food Svc Prep Sinks	4.0	10	190	1
Food Svc Pot Wash	4.0	10	190	2
Miscellaneous	Post-Retrofit Flow (gpm)	Post-Retrofit Energy Use (MMBtu/yr)		Qty
Dish Washer	2.49	37.88		1

**Table 2b**

Fixture Type	Post-Retrofit Flow (gpm)	Qty
Std 4 & 8 inch Hot and Cold	0.50	6
General Purpose Sinks	1.50	2
Fixture Type	Post-Retrofit Flow (gpf)	Qty
Urinals (capable of 0.5 diaphragm)	0.13	1

**Table 2c**

Fixture Type	Post-Retrofit Flow (gpm)	Qty		
General Purpose Sinks	1.50	1		
Fixture Type	Post-Retrofit Usage			Qty
	(gpm)	(min/day)	(days/yr)	
Hand Wash / Food Svc Hand	2.2	10	190	1
Food Svc Prep Sinks	4.0	30	190	2
Food Svc Pot Wash	4.0	30	190	1

**Table 2d**

Fixture Type	Post-Retrofit Flow (gpm)	Qty		
Std 4 & 8 inch Hot and Cold	0.50	32		
General Purpose Sinks	1.50	3		
Fixture Type	Post-Retrofit Flow (gpf)	Qty		
Urinals (capable of 0.5 diaphragm)	0.13	2		
Urinals (capable of 1.0 diaphragm)	0.13	2		
Urinals	0.13	25		
Fixture Type	Post-Retrofit Usage			Qty
	(gpm)	(min/day)	(days/yr)	
Food Svc Prep Sinks	4.0	45	190	1
Food Svc Pot Wash	4.0	45	190	1
Miscellaneous	Post-Retrofit Flow (kgal/yr)	Post-Retrofit Energy Use (MMBtu/yr)	Qty	
Ice Machine (small-medium)	19.50	15.41	1	



**Table 2e**

Fixture Type	Post-Retrofit Flow (gpm)			Qty
Std 4 & 8 inch Hot and Cold	0.50			4
Single Spigot, cold only	0.50			9
Push Button Delay Spigot	0.50			2
Fixture Type	Post-Retrofit Flow (gpd)			Qty
Urinals	0.13			18
Urinals	0.50			4
Fixture Type	Post-Retrofit Usage			Qty
	(gpm)	(min/day)	(days/yr)	
Food Svc Rest Room	2.2	10	190	1
Food Svc Pot Wash	4.0	30	190	3

**Table 2f**

Fixture Type	Post-Retrofit Flow (gpm)			Qty
Std 4 & 8 inch Hot and Cold	0.50			3
General Purpose Sinks	1.50			1

**Table 2g**

Fixture Type	Post-Retrofit Flow (gpm)			Qty
Std 4 & 8 inch Hot and Cold	0.50			2
Push Button Delay Spigot	0.50			8
General Purpose Sinks	1.50			4
Fixture Type	Post-Retrofit Flow (gpd)			Qty
Urinals (capable of 0.5 diaphragm)	0.13			2
Urinals	0.13			8
Fixture Type	Post-Retrofit Usage			Qty
	(gpm)	(min/day)	(days/yr)	
Med Hand Sinks	2.2	10	190	1
Food Svc Pot Wash	4.0	30	190	2

**Table 2h**

Fixture Type	Post-Retrofit Flow (gpm)			Qty
Std 4 & 8 inch Hot and Cold	0.50			6
Push Button Delay Spigot	0.50			29
General Purpose Sinks	1.50			28
Push Button Delay Spigot	0.50			2
Fixture Type	Post-Retrofit Flow (gpd)			Qty
Urinals	0.13			17
Fixture Type	Post-Retrofit Usage			Qty
	(gpm)	(min/day)	(days/yr)	
Hand Wash / Food Svc Hand	2.2	7	190	1
Food Svc Prep Sinks	4.0	23	190	2
Miscellaneous	Post-Retrofit Flow (kgal/yr)	Post-Retrofit Energy Use (MMBtu/yr)		Qty
Ice Machine (small-medium)	19.50	15.41		1

**Table 2i**

Fixture Type	Post-Retrofit Usage			Qty
	(gpm)	(min/day)	(days/yr)	
Med Hand Sinks	2.2	10	190	1
Hand Wash / Food Svc Hand	2.2	10	190	2
Food Svc Rest Room	2.2	10	190	1
Food Svc Pot Wash	4.0	45	190	1
Miscellaneous	Post-Retrofit Flow	Post-Retrofit Energy Use (MMBtu/yr)		Qty
Kitchen Pre Rinse Sprayer (high flow)	1.15 gpm	6.47		5
Ice Machine (small-medium)	19.5 kgal/yr	15.41		1

**Table 2j**

Fixture Type	Post-Retrofit flow (gpm)			Qty
General Purpose Sinks	1.50			4
Fixture Type	Post-Retrofit Usage			Qty
	(gpm)	(min/day)	(days/yr)	
Med Hand Sinks	2.2	10	190	1
Hand Wash / Food Svc Hand	2.2	10	190	1
Food Svc Rest Room	2.2	10	190	1
Food Svc Prep Sinks	4.0	30	190	1
Food Svc Pot Wash	4.0	30	190	2

**Table 2k**

Fixture Type	Post-Retrofit Usage			Qty
	(gpm)	(min/day)	(days/yr)	
Med Hand Sinks	2.2	10	190	1
Food Svc Pot Wash	4.0	45	190	1
Miscellaneous	Post-Retrofit Flow	Post-Retrofit Energy Use (MMBtu/yr)		Qty
Kitchen Pre Rinse Sprayer (high flow)	1.15 gpm	1.29		1
Ice Machine (small-medium)	19.5 kgal/yr	15.41		1

**Table 2l**

Fixture Type	Post-Retrofit Flow (gpm)			Qty
Std 4 & 8 inch Hot and Cold	0.50			1
Push Button Delay Spigot	0.50			3
General Purpose Sinks	1.50			12
Lab Sink - Hot and Cold	1.50			3
Fixture Type	Post-Retrofit Flow (gpd)			Qty
Urinals (capable of 0.5 diaphragm)	0.13			2
Urinals	0.13			6
Fixture Type	Post-Retrofit Usage			Qty
	(gpm)	(min/day)	(days/yr)	
Med Hand Sinks	2.2	10	190	1
Food Svc Pot Wash	4.0	30	190	2
Miscellaneous	Post-Retrofit Flow (kgal/yr)	Post-Retrofit Energy Use (MMBtu/yr)		Qty
Ice Machine (small-medium)	19.50	15.41		1

**Table 2m**

Fixture Type	Post-Retrofit Flow (gpm)	Qty
Std 4 & 8 inch Hot and Cold	0.50	4

**Table 2n**

Fixture Type	Post-Retrofit Flow (gpm)			Qty
Lab Sink - Hot and Cold	1.50			1
Fixture Type	Post-Retrofit Usage			Qty
	(gpm)	(min/day)	(days/yr)	
Hand Wash / Food Svc Hand	2.2	10	190	3
Food Svc Rest Room	2.2	10	190	1
Food Svc Prep Sinks	4.0	23	190	1
Food Svc Pot Wash	4.0	15	190	2

**Table 2o**

Fixture Type	Post-Retrofit Flow (gpm)			Qty
Std 4 & 8 inch Hot and Cold	0.50			28
Lab Sink - Hot and Cold	1.50			2
Fixture Type	Post-Retrofit Flow (gpd)			Qty
Urinals (capable of .5 diaphragm)	0.13			11
Fixture Type	Post-Retrofit Usage			Qty
	(gpm)	(min/day)	(days/yr)	
Med Hand Sinks	2.2	5	190	2
Hand Wash / Food Svc Hand	2.2	5	190	1
Food Svc Rest Room	2.2	5	190	1
Food Svc Pot Wash	4.0	15	190	3

**Table 2p**

Fixture Type	Post-Retrofit Usage			Qty
	(gpm)	(min/day)	(days/yr)	
Hand Wash / Food Svc Hand	2.2	7	190	3
Food Svc Prep Sinks	4.0	30	190	1
Food Svc Pot Wash	4.0	30	190	2
Miscellaneous	Post-Retrofit Flow (kgal/yr)	Post-Retrofit Energy Use (MMBtu/yr)		Qty
Ice Machine (small-medium)	19.50	15.41		1

**Table 2q**

Fixture Type	Post-Retrofit Usage			Qty
	(gpm)	(min/day)	(days/yr)	
Food Svc Pot Wash	4.0	10	190	1

**Table 2r**

Fixture Type	Post-Retrofit Usage			Qty
	(gpm)	(min/day)	(days/yr)	
Hand Wash / Food Svc Hand	2.2	10	190	1
Food Svc Rest Room	2.2	10	190	1
Food Svc Prep Sinks	4.0	30	190	3
Miscellaneous	Post-Retrofit Flow (kgal/yr)	Post-Retrofit Energy Use (MMBtu/yr)		Qty
Ice Machine (small-medium)	19.50	15.41		1

**Table 2s**

Fixture Type	Post-Retrofit Flow (gpm)	Qty		
Std 4 & 8 inch Hot and Cold	0.50	16		
Single Spigot, cold only	0.50	1		
Push Button Delay Spigot	0.50	2		
General Purpose Sinks	1.50	7		
General Purpose & Single Spigot, cold only	1.50	28		
Fixture Type	Post-Retrofit Flow (gpd)	Qty		
Urinals (capable of 1.0 diaphragm)	0.13	9		
Urinals	0.13	2		
Fixture Type	Post-Retrofit Usage			Qty
	(gpm)	(min/day)	(days/yr)	
Med Hand Sinks	2.2	3.33	190	1
Hand Wash / Food Svc Hand	2.2	3.33	190	1
Food Svc Rest Room	2.2	3.33	190	1
Food Svc Prep Sinks	4.0	5	190	1
Food Svc Pot Wash	4.0	5	190	2

**Table 2t**

Fixture Type	Post-Retrofit Flow (gpm)			Qty
General Purpose Sinks	1.50			1
Fixture Type	Post-Retrofit Usage			Qty
	(gpm)	(min/day)	(days/yr)	
Hand Wash / Food Svc Hand	2.2	7	190	3
Food Svc Rest Room	2.2	10	190	1
Food Svc Prep Sinks	4.0	30	190	1
Food Svc Pot Wash	4.0	22.5	190	2
Miscellaneous	Post-Retrofit Flow (kgal/yr)	Post-Retrofit Energy Use (MMBtu/yr)		Qty
Ice Machine (small-medium)	19.50	15.41		1

**Table 2u**

Fixture Type	Post-Retrofit Usage			Qty
	(gpm)	(min/day)	(days/yr)	
Med Hand Sinks	2.2	10	190	1
Hand Wash / Food Svc Hand	2.2	10	190	2
Food Svc Rest Room	2.2	10	190	1
Food Svc Prep Sinks	4.0	30	190	1
Food Svc Pot Wash	4.0	30	190	2

**Table 2v**

Fixture Type	Post-Retrofit Flow (gpm)			Qty
Std 4 & 8 inch Hot and Cold	0.50			4
Push Button Delay Spigot	0.50			4
General Purpose Sinks	1.50			4
Fixture Type	Post-Retrofit Flow (gpi)			Qty
Urinals	0.13			6
Fixture Type	Post-Retrofit Usage			Qty
	(gpm)	(min/day)	(days/yr)	
Med Hand Sinks	2.2	5	190	1
Hand Wash / Food Svc Hand	2.2	5	190	2
Food Svc Rest Room	2.2	5	190	1
Food Svc Pot Wash	4.0	8	190	2

**Table 2w**

Fixture Type	Post-Retrofit Flow (gpm)			Qty
	(gpm)	(min/day)	(days/yr)	
Push Button Delay Spigot	0.50			2
	Post-Retrofit Usage			
Fixture Type	(gpm)	(min/day)	(days/yr)	Qty
Med Hand Sinks	2.2	10	190	1
Food Svc Pot Wash	4.0	45	190	1
	Post-Retrofit Flow	Post-Retrofit Energy Use (MMBtu/yr)		Qty
Kitchen Pre Rinse Sprayer (high flow)	1.15 gpm	3.88		3
Ice Machine (small-medium)	19.5 kgal/yr	15.41		1

**Table 2x**

Fixture Type	Post-Retrofit Usage			Qty
	(gpm)	(min/day)	(days/yr)	
Med Hand Sinks	2.2	10	190	1
Hand Wash / Food Svc Hand	2.2	10	190	1
Food Svc Rest Room	2.2	10	190	1
Food Svc Pot Wash	4.0	30	190	2
	Post-Retrofit Flow (gpm)	Post-Retrofit Energy Use (MMBtu/yr)		Qty
Kitchen Pre Rinse Sprayer (high flow)	1.15	3.28		1

**Table 2y**

Fixture Type	Post-Retrofit Usage			Qty
	(gpm)	(min/day)	(days/yr)	
Med Hand Sinks	2.2	10	190	1
Hand Wash / Food Svc Hand	2.2	10	190	2
Food Svc Rest Room	2.2	10	190	1
Food Svc Pot Wash	4.0	45	190	1
	Post-Retrofit Flow	Post-Retrofit Energy Use (MMBtu/yr)		Qty
Kitchen Pre Rinse Sprayer (high flow)	1.15 gpm	6.47		5
Ice Machine (small-medium)	19.5 kgal/yr	15.41		1

## 4.0 Computation of Savings:

*The following describes the methodology for computing Actual Energy Use Savings based on validated consumption and presents guaranteed Energy Use Savings.*

### a) Computation and Presentation of Energy Use Savings:

To measure the flushometer volume (gallons per flush) a digital inline flow meter will be used. The flow meter will be installed in series with the flushometer. All water that passes through the flushometer also passes through the meter, which in turn provides an accurate accounting of the flush volume.

To measure lavatory sink flow (gallons per minute) a flow-through measuring unit will be placed on the outlet of the sink. All water that passes through the outlet of the sink also passes through the flow-through measuring unit, which in turn provides an accurate accounting of the flow rate.

Once the true pre- and post-retrofit, per fixture consumption has been established and documented in the appropriate tables of this exhibit, the values will be inserted into the appropriate columns of the detailed audit/scope of work spreadsheets. These actual values will supersede the estimated values currently represented in the spreadsheet. Hence, the resulting spreadsheets will represent the "as-built" conditions.

If the actual per fixture consumptions differ from the estimated consumptions by less than or equal to 5%, it is considered to be within an acceptable tolerance based on Qualified Provider's conservative safety factors for this energy conservation measure, and therefore satisfies the Energy Savings Guarantee.

### b) Presentation of Savings:

The energy conservation measure described herein will result in the following effect on energy usage:

Bernheim MS - Total Annual Guaranteed Water Gallons Savings:	123 kGal
Bernheim MS - Total Annual Guaranteed Therm Savings:	532 therms
Board of Ed. - Total Annual Guaranteed Water Gallons Savings:	25 kGal
Board of Ed. - Total Annual Guaranteed Therm Savings:	89 therms
Brooks ES - Total Annual Guaranteed Water Gallons Savings:	77 kGal
Brooks ES - Total Annual Guaranteed kWh Savings:	10,001 kWh
Bullitt Central HS - Total Annual Guaranteed Water Gallons Savings:	320 kGal
Bullitt Central HS - Total Annual Guaranteed Therm Savings:	850 therms
Bullitt Central HS - Total Annual Guaranteed kWh Savings:	7,299 kWh
Bullitt East HS - Total Annual Guaranteed Water Gallons Savings:	106 kGal
Bullitt East HS - Total Annual Guaranteed Therm Savings:	562 therms
Bus Garage - Total Annual Guaranteed Water Gallons Savings:	9 kGal
Bus Garage - Total Annual Guaranteed kWh Savings:	1,088 kWh
Cedar Grove ES - Total Annual Guaranteed Water Gallons Savings:	120 kGal
Cedar Grove ES - Total Annual Guaranteed kWh Savings:	12,145 kWh
Crossroads ES - Total Annual Guaranteed Water Gallons Savings:	98 kGal
Crossroads ES - Total Annual Guaranteed kWh Savings:	9,875 kWh

Eastside MS - Total Annual Guaranteed Water Gallons Savings:	81 kGal
Eastside MS - Total Annual Guaranteed kWh Savings:	12,099 kWh
Freedom ES - Total Annual Guaranteed Water Gallons Savings:	104 kGal
Freedom ES - Total Annual Guaranteed Therm Savings:	615 therms
Hebron MS - Total Annual Guaranteed Water Gallons Savings:	45 kGal
Hebron MS - Total Annual Guaranteed kWh Savings:	7,993 kWh
Lebanon Junction - Total Annual Guaranteed Water Gallons Savings:	69 kGal
Lebanon Junction - Total Annual Guaranteed Therm Savings:	6,942 therms
Maint. Bldg. 1 - Total Annual Guaranteed Water Gallons Savings:	4 kGal
Maint. Bldg. 1 - Total Annual Guaranteed kWh Savings:	518 kWh
Maryville ES - Total Annual Guaranteed Water Gallons Savings:	75 kGal
Maryville ES - Total Annual Guaranteed Therm Savings:	424 therms
Mt. Washington ES - Total Annual Guaranteed Water Gallons Savings:	83 kGal
Mt. Washington ES - Total Annual Guaranteed Therm Savings:	514 therms
Mt. Washington ES - Total Annual Guaranteed kWh Savings:	1,073 kWh
Mt. Washington MS - Total Annual Guaranteed Water Gallons Savings:	114 kGal
Mt. Washington MS - Total Annual Guaranteed Therm Savings:	505 therms
Nichols ES - Total Annual Guaranteed Water Gallons Savings:	22 kGal
Nichols ES - Total Annual Guaranteed kWh Savings:	3,612 kWh
North Bullitt HS - Total Annual Guaranteed Water Gallons Savings:	83 kGal
North Bullitt HS - Total Annual Guaranteed Therm Savings:	417 therms
North Bullitt HS - Total Annual Guaranteed kWh Savings:	1,073 kWh
<del>Old Mill ES - Total Annual Guaranteed Water Gallons Savings:</del>	<del>37 kGal</del>
<del>Old Mill ES - Total Annual Guaranteed Therm Savings:</del>	<del>152 therms</del>
Overdale ES - Total Annual Guaranteed Water Gallons Savings:	83 kGal
Overdale ES - Total Annual Guaranteed Therm Savings:	488 therms
Overdale ES - Total Annual Guaranteed kWh Savings:	1,073 kWh
Pleasant Grove ES - Total Annual Guaranteed Water Gallons Savings:	102 kGal
Pleasant Grove ES - Total Annual Guaranteed Therm Savings:	606 therms
Riverview Opp. Ctr. - Total Annual Guaranteed Water Gallons Savings:	49 kGal
Riverview Opp. Ctr. - Total Annual Guaranteed Therm Savings:	101 therms
Riverview Opp. Ctr. - Total Annual Guaranteed kWh Savings:	2,951 kWh
Roby ES - Total Annual Guaranteed Water Gallons Savings:	51 kGal
Roby ES - Total Annual Guaranteed kWh Savings:	8,691 kWh
Shepherdsville ES - Total Annual Guaranteed Water Gallons Savings:	78 kGal
Shepherdsville ES - Total Annual Guaranteed Therm Savings:	488 therms
Zoneton MS - Total Annual Guaranteed Water Gallons Savings:	81 kGal
Zoneton MS - Total Annual Guaranteed Therms Savings:	12,099 therms



**EXHIBIT E.29 – Amended February 1, 2024**  
**Energy Savings Guarantee**  
**Direct Cost Avoidance Operational Savings**

**1.0 Agreed Upon Parameters:**

*The following are mutually agreed upon parameters are hereby stipulated for the purposes of this Agreement as fact and will not be measured, monitored or adjusted.*

a) Applicability:

This part of the performance guarantee applies to the stipulated Operational Savings realized by Owner as a result of direct cost avoidance.

b) Existing Condition:

As per the calculations set forth below, Qualified Provider and Owner based direct cost avoidance Operational Savings calculation on extensive survey and analysis. The Owner and Qualified Provider collaboratively agreed upon its, methods, figures, assumptions and results throughout the calculation process.

**2.0 Operational Savings from Repair of Controls, HVAC, Lighting & Plumbing:**

Information regarding pre-retrofit operational costs for HVAC repairs, replacement and maintenance and lighting repairs were provided by the owner. Applicable budget line items identified by Owner as being eliminated as a result of the Work performed by Qualified Provider were added together. Six years of data for HVAC repairs and one year for lighting material, provided by the owner, were utilized in arriving at the stipulated Operational Savings. Savings are estimated and agreed upon by Owner and Qualified Provider based on the scope of Qualified Provider's Work and the estimated resulting reduction in operational repair costs to the Owner. To maintain a conservative estimate, Trane utilized a calculated average of six years of HVAC maintenance expenditures. The stipulated operational savings detail relating to HVAC and lighting are set forth on the following page in Tables 1, 2, and 3.

<b>HVAC Repairs, Replacement and Maintenance Operational Costs</b>		
<b>Fiscal Year</b>	<b>Facility</b>	<b>Amount</b>
2011-12	Old Mill Elementary	\$ 2,253
		\$ -
2012-13	Old Mill Elementary	\$ 2,287
		\$ -
2013-14	Old Mill Elementary	\$ 9,229
		\$ -
2014-15	Old Mill Elementary	\$ 4,242
		\$ -
2015-16	Old Mill Elementary	\$ 4,464
		\$ -
2016-17	Old Mill Elementary	\$ 19,290
		\$ -
<b>Average HVAC</b>		

<b>Lighting Material Costs</b>		
<b>Fiscal Year</b>	<b>Facility</b>	<b>Amount</b>
2016-17	District-Wide - Interior Lighting	\$ 13,800
		\$ 13,386
2016-17	District-Wide - Exterior Lighting	\$ 14,353
		\$ 13,922
<b>Total Lighting</b>		

**Table 3**

<b>Calculated Operational Savings</b>		
HVAC		\$ 6,961
		\$ -
Lighting		\$ 28,153
		\$ 27,308
<b>Total</b>		



Troutman, Angie &lt;angie.troutman@bullitt.kyschools.us&gt;

**Re: BCPS Trane Contract- Amendment 2**

1 message

**Haycraft, Laura** <laura.haycraft@bullitt.kyschools.us>  
To: "Troutman, Angie" <angie.troutman@bullitt.kyschools.us>

Thu, Jan 16, 2025 at 12:13 PM

I laid the packet of papers on your desk. Have a blessed day.

On Thu, Jan 16, 2025 at 10:21 AM Troutman, Angie <angie.troutman@bullitt.kyschools.us> wrote:  
Awesome! Thank you.

On Thu, Jan 16, 2025 at 10:17 AM Clemens, Danny <danny.clemens@bullitt.kyschools.us> wrote:  
Emily approved it and I'll be sending this back over.

----- Forwarded message -----

**From:** Vessels, Emily <Emily.Vessels@dinsmore.com>  
**Date:** Thu, Jan 16, 2025 at 10:15 AM  
**Subject:** RE: BCPS Trane Contract- Amendment 2  
**To:** Clemens, Danny <danny.clemens@bullitt.kyschools.us>, Farris, Eric <Eric.Farris@dinsmore.com>

Danny, this is acceptable. They have adjusted exhibits to remove Old Mill and adjusted any totals accordingly. I don't see any issues.

Thanks,

## Dinsmore

**Emily H. Vessels**

Associate  
Dinsmore & Shohl LLP • Legal Counsel  
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E Emily.Vessels@DINSMORE.COM • dinsmore.com

**From:** Clemens, Danny <danny.clemens@bullitt.kyschools.us>  
**Sent:** Wednesday, January 15, 2025 1:09 PM  
**To:** Vessels, Emily <Emily.Vessels@DINSMORE.COM>; Farris, Eric <Eric.Farris@DINSMORE.COM>  
**Subject:** BCPS Trane Contract- Amendment 2

Trane has asked us to amend our contract due to the prior Old Mill building not being in service (it was replaced with a new school). Can you please review the amendment to see if it's acceptable?

BCPS Trane Contract- Amendment 2