

## CHANGE ORDER

Performance Contract dated <b>April 23, 2019</b> between Johnson Controls, Inc. and Customer	Change Order No. 5	Date (mo/day/yr) 9/20/2023
Customer City of La Crosse, WI		
<p>The parties wish to add to the Scope of the Work in the Contract. JCI has amended its original scope of work by recommending certain additional Energy Conservation Measures (ECM), which are identified in Schedule 1e. JCI has included an additional Assured Performance Guarantee as described in attached Schedule 2e. After the execution of Change Order 5, JCI shall provide a new Schedule of Values and Construction Schedule that shall apply to the additional Scope of Work. The additional Contract Price and the time for completion provided below modify the Contract Price and time for completion provided in the Contract. The Guarantee Term of the Assured Performance Guarantee of this Change Order 5 shall begin upon substantial completion of the Change Order No. 5 Scope of Work as outlined below. JCI has amended the Price and Payment Terms of the original Agreement to reflect the additional price based on the Scope of Work, attached as Schedule 4e.</p> <p>The above referenced Performance Contract is hereby modified to the extent described below in accordance with the Terms and Conditions of the CHANGE ORDERS section thereof.</p>		
Scope of Work changed as follows:		
Refer to Schedule 1e – Scope of Work (below) Refer to Schedule 2e – Assured Performance Guarantee Refer to Schedule 3e – Customer Responsibilities (below) Refer to Schedule 4e – Price and Payment Terms (below)		
Current total Performance Contract amount	\$ 9,028,309	
Total amount of this Change Order	\$ 2,390,502	
Total Performance Contract amount as revised by this Change Order	\$ 11,418,811	
The time for completion is: <input checked="" type="checkbox"/> increased, <input type="checkbox"/> decreased, <input type="checkbox"/> unchanged. The completion date for the scope of work described in this Change Order is:		(mo, day, yr) <b>12 months from the date of a Notice to Proceed with this Change Order 5</b>
<input checked="" type="checkbox"/> [check if applicable] Assured Performance Guarantee changed as follows:		
The Assured Performance Guarantee for the scope of work described in Schedule 1e is independent of the prior Assured Performance Guarantee identified in Schedule 2 in the original contract and as modified in Schedule 2a in Change Order 1 and as modified in all subsequent change orders. Refer to Schedule 2e – Assured Performance Guarantee (below) for the Guarantee which applies to the Change Order 5 scope of work.		
Unless specifically changed by this Change Order, all terms, conditions, and provisions of the above referenced Performance Contract remain unchanged and in full effect.		
JOHNSON CONTROLS, INC.	CUSTOMER	
Signature:	Signature:	
Printed Name:	Printed Name:	
Title:	Title:	

## SCOPE OF WORK

### I. SUMMARY OF THE SCOPE OF WORK

The following information lists and summarizes the Improvement Measures to be implemented for this project. The matrix identifies measures included in the Work with an “X”.

ECM Number	ECM Name	Facility							
		Erickson Pool	Northside Pool	Veterans Memorial	La Crosse Fire Station #2	La Crosse Fire Station #4	La Crosse Center	La Crosse Fire Station #3	Green Island Ice Arena
ECM-35	Retrofit Facility Lighting to LED	X	X						X
ECM-36	Retrofit Building Envelope							X	
ECM-37	Install New Solar				X	X	X		
ECM-38	Install New Pool On-site Hypochlorite Generation	X	X	X					

### II. DESCRIPTION OF THE SCOPE OF WORK

The following information provides a description of the scope of work, arranged first by ECM number, then by facility.

#### ECM-35: RETROFIT FACILITY LIGHTING TO LED

This measure upgrades specified existing facility lighting to LED sources. The scope of work for lighting retrofits is summarized below. Retrofits will be completed only where identified in the tables below and only for fixtures that are currently in-use and have lamps installed.

## Retrofit Work

Green Island Ice Arena					
Facility Zone	Fixture Count	Existing Fixture Description	New Fixture Description	Replacement Type	LED CCT
Main Rink Fixtures	12	4' 12L T5 HO	KT-LED25T5HO-48GC-850-DX2 25W, 3400 Lumen, 4', 240' Beam Angle, Ballast Bypass, 5000K	Retrofit	5000K

Northside Pool					
Facility Zone	Fixture Count	Existing Fixture Description	New Fixture Description	Replacement Type	LED CCT
Throughout	26	4' 2L T8 Strip/wrap	ESL-T8B4-12W-F150 4' Tubes Series, 12 Watts, 5000 Kelvin, 1740 Lumens, 145 LM/W, Shatter-proof Film Protected	Retrofit	4000K
Fluorescent Wallpack	4	40w Wallpack	ESL-MWP-1530W-13050-BZ Mini Wall Pack, 15/20/30W Wattage Adjustable, 3000/4000/5000 Kelvin Adjustable, Up to 4,200 Lumens,	Retrofit	5000K
Entry Canopy	1	70w Canopy	ESL-CP-3060W-43050-BZ 30/40/60W Wattage Adjustable Canopy, 30/40/50K K Adjustable Up To 7,800 Lumens	Retrofit	4000K
Entrance Pendants	2	175w MH Pendant	ESL-CL-55W-440S-M 55W CL IV Series Lamp E26 Base 5205Lm 4000K	Retrofit	4000K

Erickson Pool					
Facility Zone	Fixture Count	Existing Fixture Description	New Fixture Description	Replacement Type	LED CCT
Pump room & closets	6	4' 2L T8 Strip/vaportight	ESL-T8B4-12W-F150 12 Watts, 5000 Kelvin, 1740 Lumens, 145 LM/W	Retrofit	4000K
Throughout	42	4' VT 2L 40w PLL	ESL-Ti-VP4RK-S-36W-F40 36Watts 4000 Kelvin 4570 Lumens 127 lm/W	Retrofit	4000K
Ceiling Round	23	26w 4pin CFL	KT-LED94P-H-840-S 9Watt LED PL Lamp - 4-Pin - 4000K - 1,050 Lumens - Ballast Compatible	Retrofit	4000K

*ECM-Specific Inclusions, Exclusions, and Clarifications to the Scope of Work*

- Customer shall be responsible for any and all hazardous material abatement prior to installation of any components as required.
- All circuit breakers, contactors, switches/controls, existing fixtures, and the electrical system in general including grounding are assumed to be operational working order and compliant with current NEC requirements; repairs to bring the electrical system into operational working order and compliant with current NEC are excluded.
- Lighting fixtures not identified in the Scope of Work are excluded from any repair or replacement scope.
- Reconfiguration of existing lighting system layout is excluded, except where noted in the Scope of Work.

- Conformance to IESNA standards is excluded if the existing layout does not comply with same.
- Conformance to broadcast recording lighting requirements is excluded,
- Repair, replacement, or calibration of damaged or defective motion sensors, time clocks, switches, breakers, and wiring unless otherwise noted in the Scope of Work is excluded.
- Repair, replacement, or upgrade of existing indoor or exterior emergency and/or egress lighting system unless otherwise noted in the Scope of Work is excluded.
- Replacement of defective emergency battery backup ballasts unless otherwise noted the Scope of Work is excluded.
- Repair or upgrades required to rectify existing lighting or electrical system code violations unless specifically described in this Scope of Work is excluded.
- Repair or replacement of cracked, broken, missing, yellowed, or damaged fixture lenses or louvers unless otherwise noted in the Scope of Work is excluded.

### **ECM-36: RETROFIT BUILDING ENVELOPE**

Fire Station #3 was surveyed for the application of this measure. Energy is lost from various leakages throughout the buildings due to infiltration or exfiltration. The heat losses and heat gains occur due to gaps and openings that allow the building's conditioned (heated or cooled) air to mix with the outside ambient air. This measure will seal these leaks, resulting in energy savings and may improve comfort in the areas and occupied spaces that are subjected to outside air infiltration.

Infiltration/Exfiltration is the rate of uncontrolled air exchange that occurs through unintentional building openings. Throughout the buildings, leaks were found that would allow heat to be lost during the winter and heat gained during the summer. These openings range from gaps around doors, overhang garage doors and various other gaps allowing air to pass from a region of higher pressure to that of lower pressure. Outside wind conditions also provide increased pressure gradients across the leakage surfaces, which allow for correspondingly increased leakage rates. Temperature gradients also create the "source to sink" flow, therefore the greater the difference between the outside air and the indoor air temperature, the greater the rate of infiltration. Doors, roof to wall joint, rooftop ventilator and defunct relief vents are all major heat loss and gain contributors to the buildings.

JC shall install door sweeps and weather-stripping around doors and apply air sealing foam around structural leakage where roof meets the wall. During the door weatherproofing process, the hinges may need to be replaced to ensure proper mechanical functioning. Also, the treads may need to be replaced with higher compressive strength units in order to maintain seal quality and ensure that deformation does not occur after the improvement due to possible rolling loads. All weather-stripping is to be of aluminum mill finish with a black gasket, unless otherwise specified.

<b>La Crosse Fire Station #3</b>		
<b>TYPE OF MEASURES</b>	<b>Building level</b>	<b>quantity or distance</b>
Roof / Wall Joint to be Sealed.	Roof	160 Feet
Ext. Door(s) to be weather-stripped & sealed	All Levels	4 Doors
Over-head Door(s) to be sealed on 3 sides	All Levels	4 OH Doors

#### **Inclusions:**

- Weather-stripping of doors
- Foam air sealing of the gap where roof meet the wall
  - Fire Retardant, Poly Urethane Foam

**Exclusions:**

- Repair, replacement, or the addition of insulation
- Replacement of building elements (windows, doors, etc.)
- Window Film
- Changes to building pressurization
- Air curtains

**ECM-37: INSTALL NEW SOLAR PV**

This ECM includes the installation of a new solar photovoltaic (PV) system which will be located on existing roofs at the La Crosse Center, La Crosse Fire Station #2, and La Crosse Fire Station #4 (a new building to be constructed in 2024 and currently in design phase). The systems will be connected via a net-metering agreement to the existing electric meters serving each facility. The new PV system will reduce the net consumption of electricity at the facilities by producing electricity using solar energy. A reduction in electric demand is also anticipated as a result of the generating capacity of the new PV system.

*New Installation Work*

Impacted Facilities:

- Design and final engineering for each proposed photovoltaic system, including permit drawings and structural review.
- Provide and install photovoltaic modules arranged at each facility to comprise the system size, azimuth, and tilt as noted in the table below. Modules to be Vertex N TSM-NEG19RC.20 bifacial dual glass mono-crystalline modules or equal, quantities to be determined during final design.
- Provide and install AC-to-DC inverters as identified in the table below. Inverters to be CPS inverters or equal, quantities and sizes to be determined during final design.
- Photovoltaic modules to be mounted to appropriate mounting hardware on existing roof surfaces. Mounting hardware to be either a ballasted racking system installed on existing flat roof surfaces or flush mount rail system for sloped roof surfaces, final racking to be determined during final design.
- Provide a Performance Data Acquisition system including data logger with a minimum of one year of data storage, current transformers, irradiance sensors, data output connections, and kiosk software. Irradiance sensors to be installed at each facility in the plane of the array or horizontally to be determined during final design.
- Provide one high-accuracy pyranometer to monitor global horizontal irradiance, located at La Crosse Center, to be connected to that facility's Performance Data Acquisition system. Plane-of-array sensors will be installed at the other two sites.

Facility	Array Size	Array Azimuth	Array Tilt	Inverter	Sensor	Service Voltage
La Crosse Center	251 kW(dc) / 185 kW(ac)	One (1) segment at 204 degrees (250 Modules) One (1) segment at 207 degrees (172 Modules)	10 Degree tilt	CPS	Horizontally installed pyranometer with backup sensor	480/277V
La Crosse Fire Station #2	54 kW(dc) / 50 kW(ac)	One (1) segment at 165 degrees	10 Degree tilt	CPS	plane-of-array solar irradiance	208/120 V
La Crosse Fire Station #4	69 kW(dc) / 50 kW(ac)	Two (2) segments at 180 degrees	10 Degree tilt	CPS	plane-of-array solar irradiance	208/120 V

*ECM-Specific Inclusions, Exclusions, and Clarifications to the Scope of Work*

- Customer shall be responsible for any and all hazardous material abatement prior to installation of any components as required.
- All electrical distribution panels, circuit breakers, contactors, switches/controls, existing fixtures, and the electrical system in general including grounding are assumed to be operational working order and compliant with current NEC requirements; repairs to bring the electrical system into operational working order and compliant with current NEC are excluded.
- The new Fire Station #4 in the design phase will be built to the design specification provided in the drawings forwarded by Wendel during the development phase of this solar project. Any changes to the direction of the building and delay in construction of the building will impact the project timeline of the Solar PV and may impact cost and savings.
- Scope includes electrical cabling required to connect photovoltaic modules into strings and arrays of panels per manufacturer recommended and code compliant cabling. Electrical connections from arrays to inverters and from inverters to the electric meter to be in code compliant conduit.
- Johnson Controls shall install the new PV systems with existing roof manufacturer standards to maintain current and any new roof warranty(ies) as it relates to the solar panel installation. At impacted locations, existing structural steel, joists, roof decks, parking lots, walkways are anticipated to be adequate for solar panel installation. If during the design phase Johnson Controls, encounter structural issues, geo-tech issues, drainage issues, septic system issues with any of the roofs, roof framing, parking lots and walkways, JCI shall relocate the problem areas of solar arrays to a different location in order to maintain the total system size. An adjustment to the guarantee will occur if the new location is on a different electric rate.
- In the event that any of the proposed locations are determined to not be a viable option without significant modifications as determined above, the scope of work for this ECM shall be reduced by deduct change order and the costs associated with the reduced scope shall be credited to the Customer. The guaranteed savings shall also be adjusted accordingly by a formal written amendment to the Agreement. Alternatively, customer may, at customer's option, provide an equitable adjustment change order to Johnson Controls for any necessary modifications not included in the scope of work required to accommodate the installation.

**Exclusions:**

- Resolution of existing design, service, and or distribution conditions known or unknown.
- Correction of any existing applicable building code violations and Federal Americans with Disabilities Act (ADA) violations identified by JCI during the execution of the Work. Such violations will be brought to the attention of the Customer for remedy.
- Temporary power during tie-in.
- Repair or replacement of defective electrical equipment and electrical distribution system, except the equipment described in the Scope of Work (Defective equipment identified by JCI during implementation of the Scope of Work will be brought to the attention of the Customer).
- Repairs/replacement of electrical components or wire found to be corroded or rusted or otherwise unacceptable for installation of components or fittings required for installation other than what is specified in the Scope of Work.
- The scope of work does not include the repair or installation of any structural systems.
- The scope of work does not include the repair or installation of any roofs.
- Ongoing annual fees past year 5 for the PV monitoring system.

**ECM-38: INSTALL NEW POOL - ON-SITE HYPOCHLORITE GENERATION***Aquatic Water Treatment*

This ECM includes the replacement of existing Pular system with Nexgen 60 on site hypochlorite system. The proposed Nexgen system, or Sodium hypochlorite generators, produce pool chlorination chemicals from the electrochemical reaction between salt, water, and electricity.

Facility	Current System Type	Chemical Type	Proposed System
Erickson Pool	Pular System	Calcium Hypochlorite Muriatic Acid/CO2	Nexgen 60
Northside Pool	Pular System	Calcium Hypochlorite Muriatic Acid/CO2	Nexgen 60

Facility	Current System Type	Chemical Type	Proposed System
Veterans Memorial	Pular System	Calcium Hypochlorite Muriatic Acid/CO2	Nexgen 60

### *VFD Installation and Programming (Aquatic Control)*

This ECM also includes the installation of VFD on existing motors at northside and Erickson pools. Each of the three sites, Erickson, Northside, and Veterans Memorial, has a circulation pump and feature pumps. The Veterans Memorial already has VFD installed but it is not actively controlled – the Veterans Memorial VFD will be programmed to work with the new Aquatic controls. All the sites have class F motor/pumps which do not need to be replaced.

### The proposed installation:

#### Northside

- The existing BECSys chemistry controller will be re-used
- Furnish and install a new VFD and new smart controller to meet state required turnover rate
- On-Site Start-Up and Training

#### Veterans Memorial

- The existing BECSys chemistry controller will be re-used.
- Reprogramming of existing VFD (existing VFD shall remain in place) and add new VFD smart controller to meet state required turnover rate
- On-Site Start-Up and Training

#### Erickson

- The existing BECSys chemistry controller will be re-used.
- Furnish and install a new VFD and new smart controller to meet state required turnover rate
- On-Site Start-Up and Training

Site Name	Northside	Veterans Memorial	Erickson
Replacement of existing Pump	NO	NO	NO
Smart Aquatic Controller with VFD Integration	YES	YES	YES
New Chemistry Controller*	NO	NO	NO
Pump Motor Size	25hp	25hp	40hp

\* Reuse Existing BECSys

### *ECM-Specific Inclusions, Exclusions, and Clarifications to the Scope of Work*

- Owner provides salt.
- Existing contract with Carrico and any changes or impacts to that contract as a result of this contract shall be the responsibility of the City of La Crosse
- Customer shall be responsible for any and all hazardous material abatement prior to installation of any components as required.

- All circuit breakers, contactors, switches/controls, existing fixtures, and the electrical system in general including grounding are assumed to be operational working order and compliant with current NEC requirements; repairs to bring the electrical system into operational working order and compliant with current NEC are excluded.
- All workmanship will be warranted for a period of one year.
- All materials will be warranted by the manufacturer's warranty. Warranty does not cover damage by misuse, abuse, tampering or "acts of nature" outside our control.

- |                                 |          |
|---------------------------------|----------|
| 1. Aquaify (SPC / VFD's)        | (1) Year |
| 2. ChlorKing (NEXGEN / HypoGen) | (3) Year |

*Inclusions:*

- Design and Engineering:
  - Perform site assessment.
  - Provide design for equipment replacement and upgrades.
  - Provide equipment installation specifications.
  - Provide piping and piping interface. (Nexgen)
  - Provide engineer stamped construction drawings.
- General Construction:
  - Construction administration and management of the scope of work and interfacing scopes of work.
  - Documentation including:
    - Design-assist:
      - Review and comment on site utilities and site located equipment.
      - Provide installation sequencing and methods description.
      - Provide and coordinate locations and elevations of piping, conduits, devices, and plumbing.
      - Provide and coordinate floor, wall, tank, and roof penetrations.
      - Review, comment and coordinate equipment and material submittal package/s.
  - Certifications.
  - Manuals.
  - Shop drawings and schematics.
  - Safety and project reporting.
  - Warranties.
  - Close-out documentation.
  - Freight for supplied items.
  - Receive, store, manage and deliver equipment provided by ECM/Aqua Energy Services.
  - Rubbish and recycling service.
  - Equipment supply and rental of contractor specific equipment.
  - Travel and lodging of specialty operators and technicians.
- Permits:



- Procure Building Permit for electrical installation under General Pool Contractor License, using electrical subcontractor. Final price based on stated final project cost. (see allowance).
- Coordinate and procure electrical engineering and stamped plans.
- Electrical permit application for added circuits as a portion of main building permit.
- Coordinate with local health authority.
  - Health permit to construct/renovate (if needed)
  - Courtesy calls, meetings, shared information (as needed) to keep them aware of the system changes.
  - It is assumed that a construction license will not be required by the health department. We make this assumption based on research of City, County, and state codes and statutes.
- Demolition:
  - Demolish and dispose of removed equipment aside from all equipment that the owner requests to be preserved (Notice must be provided to JCI 15 days prior to demolition).
- Concrete:
  - Re-Use existing housekeeping pads for pool pumps..
- Filter Room Equipment:
  - Replace pumps using like for like same brand pumps with upgraded motors. (Same motor frame and mounting plate)
  - Install VFDs for each pump with smart control on circulation only.
  - All pump installations that interface with existing flanges will include new gaskets.
  - Hoisting and rigging. Use of existing hoisting equipment where available.
- Sanitation System:
  - Replace existing sanitation system with ChlorKing NEXGEN Systems.
  - Re-use and re-program existing controllers.
- Electrical: (Pools, Features, and Pool/Feature Equipment Only)
  - Supply and install of conduit, line and low voltage power, and signal wiring to new pool mechanical equipment and controls.
  - Disconnect and reconnect equipment to be replaced.
  - All Conduit will be schedule 40 PVC, interior and exterior equipment to be NEMA 4X rated.
  - Pipe, fittings, wire, junction boxes, breakers.
  - Bonding and grounding of new equipment.
  - Electrical work downstream of the existing pool electrical panel. Replacement of feeder and panel is excluded.
- Scaffolding:
  - Scaffolding and lift systems to perform scope of work are included.
- Start-up and Testing:
  - Start-up of pool systems.
  - Testing of pool systems.
  - Owner's training for a total of 4 hours.

## Exclusions:

## General Conditions:

- a. All other permits, applications, & fees outside of electrical permits including: NPDES, SMA, Building, etc.
- b. Liquidated damages & retainage.
- c. Protection of finished and adjacent surfaces.
- d. Weather protection.
- e. Temporary utilities, facilities, controls, etc.
- f. Construction barriers, erosion, or dust/noise/fume control.

## 2. Concrete

## 3. Waterproofing

## 4. Landscaping

## 5. HVAC system

## 6. Mechanical, plumbing, excavation, site surveying, grading, architectural, and structural.

## 7. Utilities:

- a. Connections to the sewer/storm/waste.
- b. Sewer outside of backwash piping.
- c. Storm.

## 8. Electrical:

- a. All electrical upstream of existing facility power.
- b. Solar PV system connections.

## 9. Commissioning:

- a. Cost of water for hydrostatic testing and testing of water recirculation systems.
- b. Cost of electricity for system and equipment testing.
- c. Pool specific – commissioning, start-up, or maintenance of pools and/or any pool or facility systems outside this direct scope of work.

## 10. Anything not expressly stated above.

## ASSURED PERFORMANCE GUARANTEE

### I. PROJECT BENEFITS

**A. Certain Definitions.** For purposes of this Agreement, the following terms have the meanings set forth below:

**Annual Project Benefits** are the portion of the projected Total Project Benefits to be achieved in any one year of the Guarantee Term.

**Annual Project Benefits Realized** are the Project Benefits actually realized for any one year of the Guarantee Term.

**Annual Project Benefits Shortfall** is the amount by which the Annual Project Benefits exceed the Annual Project Benefits Realized in any one year of the Guarantee Term.

**Annual Project Benefits Surplus** is the amount by which the Annual Project Benefits Realized exceed the Annual Project Benefits in any one year of the Guarantee Term.

**Baseline** is the mutually agreed upon data and/or usage amounts that reflect conditions prior to the installation of the Improvement Measures as set forth in Section IV below.

**Capital Contribution** represents the amount the Customer will contribute to upgrade facilities as part of this project. Customer will contribute additional budget capacity each year to support the repayment of the capital investment that JCI is putting in the facilities.

**Guarantee Term** will commence on the first day of the month next following the Substantial Completion date and will continue through the duration of the M&V Services, subject to earlier termination as provided in this Agreement.

**Installation Period** is the period beginning on JCI's receipt of Customer's Notice to Proceed and ending on the commencement of the Guarantee Term.

**Measured Project Benefits** are the utility savings and cost avoidance calculated in accordance with the methodologies set forth in Section III below.

**Non-Measured Project Benefits** are identified in Section II below. The Non-Measured Project Benefits have been agreed to by Customer and will be deemed achieved in accordance with the schedule set forth in the Total Project Benefits table below. Customer and JCI agree that: (i) the Non-Measured Project Benefits may include, but are not limited to, future capital and operational costs avoided as a result of the Work and implementation of the Improvement Measures, (ii) achievement of the Non-Measured Project Benefits is outside of JCI's control, and (iii) Customer has evaluated sufficient information to conclude that the Non-Measured Project Benefits will occur and bears sole responsibility for ensuring that the Non-Measured Project Benefits will be realized. Accordingly, the Non-Measured Project Benefits shall not be measured or monitored by JCI at any time during the Guarantee Term, but rather shall be deemed achieved in accordance with the schedule set forth in the Total Project Benefits table below.

**Project Benefits** are the Measured Project Benefits plus the Non-Measured Project Benefits to be achieved for a particular period during the term of this Agreement.

**Total Project Benefits** are the projected Project Benefits to be achieved during the entire term of this Agreement.

**Utility Incentive Benefits** are a one-time rebate anticipated to occur during Year 1 of the Project Benefits Term and are not guaranteed by JCI.

**B. Project Benefits Summary.** Subject to the terms and conditions of this Agreement, JCI and Customer agree that Customer will be deemed to achieve a total of \$2,396,929 in Non-Measured Project Benefits and JCI guarantees that Customer will achieve a total of \$1,037,760 in Measured Project Benefits during the term of this Agreement, for Total Project Benefits of \$3,434,689 as set forth in the Total Project Benefits table below.

**Total Project Benefits**

Year	Guaranteed Benefits	Not Guaranteed			Capital Contribution****	Total
	Utility Cost Avoidance [Measured]*	Operations & Maintenance Cost Avoidance**	Utility Cost Avoidance [Non-measured]**	Utility Incentive Benefits***		
1	\$ 37,293	\$ 33,699	\$ 29,739	\$393,409	\$ 96,539	\$590,680
2	\$ 38,785	\$ 34,795	\$ 30,929	\$ -	\$ 96,478	\$200,986
3	\$ 40,336	\$ 35,925	\$ 32,166	\$ -	\$ 54,045	\$162,472
4	\$ 41,950	\$ 37,093	\$ 33,453	\$ -	\$ -	\$112,495
5	\$ 43,628	\$ 38,299	\$ 34,791	\$ -	\$ -	\$116,717
6	\$ 44,936	\$ 39,543	\$ 35,834	\$ -	\$ -	\$120,314
7	\$ 46,285	\$ 40,828	\$ 36,909	\$ -	\$ -	\$124,022
8	\$ 47,673	\$ 42,155	\$ 38,017	\$ -	\$ -	\$127,845
9	\$ 49,103	\$ 43,525	\$ 39,157	\$ -	\$ -	\$131,786
10	\$ 50,576	\$ 44,940	\$ 40,332	\$ -	\$ -	\$135,848
11	\$ 52,094	\$ 46,401	\$ 41,542	\$ -	\$ -	\$140,036
12	\$ 53,656	\$ 47,909	\$ 42,788	\$ -	\$ -	\$144,353
13	\$ 55,266	\$ 49,466	\$ 44,072	\$ -	\$ -	\$148,804
14	\$ 56,924	\$ 51,073	\$ 45,394	\$ -	\$ -	\$153,391
15	\$ 58,632	\$ 52,733	\$ 46,756	\$ -	\$ -	\$158,121
16	\$ 60,391	\$ 54,447	\$ 48,159	\$ -	\$ -	\$162,996
17	\$ 62,203	\$ 56,216	\$ 49,603	\$ -	\$ -	\$168,022
18	\$ 64,069	\$ 58,043	\$ 51,091	\$ -	\$ -	\$173,203
19	\$ 65,991	\$ 59,930	\$ 52,624	\$ -	\$ -	\$178,545
20	\$ 67,970	\$ 61,878	\$ 54,203	\$ -	\$ -	\$184,051
<b>Total</b>	<b>\$1,037,760</b>	<b>\$ 928,899</b>	<b>\$ 827,559</b>	<b>\$393,409</b>	<b>\$ 247,061</b>	<b>\$3,434,689</b>

\* Utility Cost Avoidance figures in the table above are based on anticipated increases in unit energy costs as set forth in the table in Section IV below and are rounded to the nearest hours.

\*\* Operations & Maintenance Cost Avoidance are Non-Measured Project Benefits. Operations & Maintenance Cost figures in the table above are based on a mutually agreed fixed annual escalation rate of three and one quarter percent (3.25%) beginning Year 1 and are rounded to the nearest dollar.

\*\*\* Utility Incentive Benefits are a one-time rebate anticipated to occur during Year 1 of the Project Benefits Term and are not guaranteed by JCI.

\*\*\*\* The amounts set forth in the Capital Contribution column reasonably represent the amount the Customer will contribute to upgrade facilities as part of this project. Customer will contribute additional budget capacity each year to support the repayment of the capital investment that JCI is putting in the facilities.

Within sixty (60) days of the commencement of the Guarantee Term, JCI will calculate the Measured Project Benefits achieved during the Installation Period plus any Non-Measured Project Benefits applicable to such period and advise Customer of same. Any Project Benefits achieved during the Installation Period may, at JCI's discretion, be allocated to the Annual Project Benefits for the first year of the Guarantee Term. Within sixty (60) days of the first anniversary of the commencement of the Guarantee Term, JCI will calculate the Measured Project Benefits achieved for the applicable year plus any Non-Measured Project Benefits applicable to such period and advise Customer of same.

***Customer acknowledges and agrees that if, for any reason, it (i) cancels or terminates receipt of M&V Services, (ii) fails to pay for M&V Services in accordance with Schedule 4, (iii) fails to fulfill any of its responsibilities necessary to enable JCI to complete the Work and provide the M&V Services, or (iv) otherwise cancels, terminates or materially breaches this Agreement, the Assured Performance Guarantee shall automatically terminate and JCI shall have no liability hereunder.***

### **C. Project Benefits Shortfalls or Surpluses.**

- (i) ***Project Benefits Shortfalls.*** If an Annual Project Benefits Shortfall occurs for any one year of the Guarantee Term, JCI shall, at its discretion and in any combination, (a) set off the amount of such shortfall against any unpaid balance Customer then owes to JCI, (b) where permitted by applicable law, increase the next year's amount of Annual Project Benefits by the amount of such shortfall, (c) pay to Customer the amount of such shortfall, or (d) subject to Customer's agreement, provide to Customer additional products or services, in the value of such shortfall, at no additional cost to Customer. Should a shortfall occur, payment would only be made during those years with paid M&V Services.
- (ii) ***Project Benefits Surpluses.*** If an Annual Project Benefits Surplus occurs for any one year of the Guarantee Term, JCI may, at its discretion and in any combination, (a) apply the amount of such surplus to set off any subsequent Annual Project Benefit Shortfall during the Guarantee Term, or (b) bill Customer for the amount of payments made pursuant to Section C(i)(c) above and/or the value of the products or services provided pursuant to clause C(i)(d) above, in an amount not to exceed the amount of such surplus.
- (iii) ***Additional Improvements.*** Where an Annual Project Benefits Shortfall has occurred, JCI may, subject to Customer's approval (which approval shall not be unreasonably withheld, conditioned, or delayed), implement additional Improvement Measures, at no cost to Customer, which may generate additional Project Benefits in future years of the Guarantee Term.

## II. NON-MEASURED PROJECT BENEFITS

Customer has furnished the foregoing information to JCI, which information forms the basis of the Non-Measured Project Benefits. Customer agrees that the Non-Measured Project Benefits are reasonable and that the installation of the Improvement Measures will enable Customer to take actions that will result in the achievement of such Non-Measured Project Benefits.

### ECM-35: Lighting Retrofit

- Erickson Pool – Exterior
- Northside Pool – Exterior

The savings for this ECM are generated through a reduction in energy used by the lighting system.

Estimated Parameters	Assumed Value	Justification, Source and Description
Pre- and Post-Installation Fixture Power Draw (kW)	ANSI	The pre-retrofit and post-installation power draw are based on typical wattages as published by ANSI (American National Standards Institute).
Burn Hours	See below.	The lighting system annual run hours by space type are agreed to be as shown in the table below. These run hours are based on interviews with staff and published operating hours. These values will not be measured.

Burn Hours:

Location	Fixture Type (Pre-retrofit)	Fixture Type (Post-retrofit)	Quantity	Burn Hours
Erickson Pool	4' 2L T8 Strip/vaportight	ESL-T8B4-12W-F150	6	500
	4' VT 2L 40w PLL	ESL-Ti-VP4RK-S-36W-F40	42	
	26w 4pin CFL	KT-LED94P-H-840-S	23	
Northside Pool	4' 2L T8 Strip/wrap	ESL-T8B4-12W-F150	26	750
	40w Wallpack	ESL-MWP-1530W-13050-BZ	4	500
	70w Canopy	ESL-CP-3060W-43050-BZ	1	4300
	175w MH Pendant	ESL-CL-55W-440S-M	2	500

### Equations for Calculating Lighting Retrofit Savings

#### Demand (kW)

$$\text{Connected kW Saving} = \sum_u [ (\text{kW/Fixture}_{\text{baseline}} \times \text{Quantity}_{\text{baseline}} - \text{kW/Fixture}_{\text{post}} \times \text{Quantity}_{\text{post}}) ]_{t,u}$$

$$\text{kW Savings} = \sum_u [ \text{Connected kW Savings}_u \times \text{Coincident Factor}_u ]_{t,u}$$

where:

- kW/fixture<sub>baseline</sub> = lighting baseline demand per fixture for usage group *u*
- kW/fixture<sub>post</sub> = lighting demand per fixture during post-installation period for usage group. If multiple wattages are possible (i.e. multiple levels of lighting are possible) then the wattage to be used is the highest wattage
- Quantity<sub>baseline</sub> = quantity of affected fixtures before the lighting retrofit for usage group *u*
- Quantity<sub>post</sub> = quantity of affected fixtures after the lighting retrofit for usage group *u*
- Coincident Factor<sub>u</sub> = *Coincident* Factor is a percentage multiplier to account for Demand Diversity of each specific usage group *u*. This might be 100% for hallways and open offices (all fixtures on during the day), or 75% for private offices, many of which are generally vacant with lights off at any one time

An example of usage group is 4' four lamp T-8 fixtures.

**Energy (kWh)**

$$\text{kWh Savings}_{\text{Lighting}} = \sum_s [(kW/\text{Fixture}_{\text{baseline}} \times \text{Quantity}_{\text{baseline}} \times \text{Burn Hours}) - \sum_{\text{level}} (kW/\text{Fixture}_{\text{post}} \times \text{Quantity}_{\text{post}} \times \text{Burn Hours})]_{t,s}$$

where:

- kW Savings<sub>u</sub> = kilowatt savings realized during the post-installation time for usage group *u*
- Burn Hours = number of operating hours during the time period *t* for the usage group *s* (*s* is space type, for example offices)
- Level For post-installation the level is the wattage trim level. Example levels include daylight harvesting, presentation mode and full power

It is agreed that these are reasonable values and will not be measured.

Note: Green Island Ice Arena Lighting Retrofit energy savings are not included because the utility invoices are paid by the tenant which is not an entity of the City of La Crosse.

**ECM-36: Building Envelope – Fire Station #3**

The savings for this ECM are generated through a reduction in air leakage through the building envelope.

Air Leakage	Length (feet)	Width (inches)	Total (square feet)
Roof/Wall	160	1/32	0.42
Overhead Doors	80	3/32	0.63
Doors	39	1/8	0.41

The savings will be calculated according to:

$$\text{Energy savings} = (\text{leakage} \times \text{bldg "K"}) \times (\text{wind P factor}) \times (\text{HDD} \times 24 \times 60) \times (.075) \times (.243) / 100,000 \times \text{System Efficiency \%}$$

...where,

- Leakage = 1.46 square feet
- Bldg "K" = average air infiltration and has been calculated to be 140 liters per second
- Wind P factor...based upon NOAA 30-year Climate Normal
- Hours per day = 24
- Minutes per hour = 60
- Density of Air = 0.075 lbm/ft<sup>3</sup>
- Specific Heat of Air = 0.243 btu/lbm-F



System Efficiency = 80%

It is agreed that these are reasonable values and will not be measured.

**ECM-37: Solar PV - Demand**

- Fire Station #2
- Fire Station #4
- La Crosse Center

The calculated demand savings for solar photovoltaic installations depend on-peak solar generation occurring at the same time as peak building demand. Due to the unpredictability of weather and building usage patterns, these values are calculated based on historical weather data (Typical Meteorological Year, or TMY) and assumed building energy demand profiles and will not be measured.

The utility rates are explained in Section IV below. The monthly demand charges are calculated as follows:

$$Demand\ Charges\ (\$) = Monthly\ Distribution\ Demand\ Charges\ (\$) + Monthly\ Peak\ Demand\ Charges\ (\$)$$

$$Distribution\ Demand\ Charge\ (\$) = [Max\ (Annual\ Distribution\ Demand(kW)) * Distribution\ Demand\ Rate\ (\$/kW)]$$

$$Monthly\ Peak\ Demand\ Charge\ (\$) = Monthly\ Peak\ Demand\ (kW) * Seasonal\ Peak\ Demand\ Rate\ (\$/kW)$$

The estimated energy production for this ECM is based on a computer simulation performed using the HelioScope software. Hourly simulation results from the HelioScope software were then fed into the Energy Toolbase software to determine the demand savings by comparing the estimated demand profile of the building before solar is installed to the estimated demand profile after solar is installed. Below are the anticipated demand savings for each site:

Location	Average Monthly Demand (kW)
Fire Station #2	39
Fire Station #4 [New]	39
La Crosse Center	162

It is agreed that these are reasonable values and will not be measured.

**ECM-38: On-Site Sodium Hypochlorite Generation**

- Erickson Pool
- Northside Pool
- Veterans Memorial Pool

The *electric savings* have been calculated according to:

Baseline Pump Energy Usage (kWh):

$$Max\ Motor\ Rating\ (kW) = HP * 0.746\ kW/HP * Pump\ Service\ Factor$$

$$Current\ Pump\ Usage\ (kW) = Max\ Motor\ Rating\ (kW) * Estimated\ Load\ Factor\ for\ fixed\ speed\ pump\ \%$$

Current Pump Usage (kW) X 87 Days X 24 Hours/Day

Proposed Pump System Operation (kWh):

Proposed Pump Usage (kW) = Rated Pump Head (TDH) X Design Flowrate GPM / (% Pump Eff. X 3,960 constant factor) / (NEMA Nominal Motor Efficiency) X 0.746 kW/HP

Proposed Pump Usage (kW) X 87 Days X 24 Hours/Day

Annual Energy Savings = Baseline Pump Energy Usage (kWh) – Proposed Pump System Operation (kWh)

...where,

<b>Pool/Aquatic Specifications</b>			
<b>Venue:</b>	<b>Northside</b>	<b>Veterans Memorial</b>	<b>Erickson</b>
Volume (Gallons)	230,000	268,000	250,000
Min. Required Turnover Time (Minutes)	360	360	360
Days of Operation (per year)	87	87	87
Occupied or In-Use Hours (Daily)	7	7	10
Unoccupied or Not In-Use Hours (Daily)	17	17	14
Occupied Hours (Annual)	609	609	870
Unoccupied Hours (Annual)	1,479	1,479	1,218
Filter Type	Sand	Sand	Sand
Backwash Interval (Days)	7	7	7
Pressure at Pump Effluent (PSI)	2	8	13
Vacuum at pump Influent (inHg)	10	10	10
Current Pumping TDH	15.92	29.78	41.33
Dirty Filter TDH (Est. based on filter differential at backwash)	68.00	68.00	68.00
Current Design Turnover Time	360.78	393.79	339.63
Min. Turnover Rate (GPM)	639	744	694

<b>Current Pump System Operation</b>			
<b>Pump ID</b>	<b>Northside</b>	<b>Veterans Memorial</b>	<b>Erickson</b>
Pump Size (Horsepower)	25	25	40
Rated Pump Flow (gpm)	750	847	866
Rated Pump Head (TDH)	70	70	70
NEMA Nominal Motor Efficiency	91%	89.5%	91.7%
Pump Motor Service Factor	1.1	1.25	1.25
Pump Operation per Day (hrs)	24	24	24
Estimated Load Factor for fixed speed pump %	85.0%	80.4%	85.0%
Water Horsepower (Calculated)	13.26	14.97	15.31
Pump Brake Horsepower (Calculated)	14.57	16.73	16.69
Pump Efficiency	91%	90%	92%

Ratio	0.58	0.67	0.42
Max Motor Rating (kW)	20.52	23.31	37.30
Current Pump Usage (kW)	17.44	18.73	31.71
Current Yearly Pump Usage (kWh)	36410.02	39111.57	66200.04
Current Yearly Pump Cost	\$2,736.46	\$2,939.50	\$4,975.39

Proposed Pump System Operation with venue in use (Bather Mode)			
Pump Model#			
Pump Size (Horsepower)	25	25	40
Rated Pump Flow (gpm)	750	847	866
Rated Pump Head (TDH)	70	70	70
NEMA Nominal Motor Efficiency	91.0%	89.5%	91.7%
Pump Motor Service Factor	1.1	1.25	1.25
Water Horsepower (Calculated)	13.26	14.97	15.31
Pump Brake Horsepower (Calculated)	14.57	16.73	16.69
Pump Efficiency	91%	90%	92%
Ratio	0.58	0.67	0.42
Max Motor Rating (kW)	20.52	23.31	37.30
Pump operation per day in Bather Mode (hrs)	24	24	24
Percentage of time in (DAY MODE)	100%	100%	100%
Design Flowrate GPM (default to Minimum Req.)	638.9	744.4	694.4
Unique based on known head	0.000124444	9.75734E-05	9.33388E-05
Average System TDH (ft)	50.80	54.07	45.01
Average System BHP	9.01	11.36	8.61
Average Motor Power (kW)	7.38	9.47	7.00
Load Factor	36%	41%	19%
Proposed Pump Usage (kW)	10.17	12.26	10.89
<b>Yearly Pump Usage in Day Mode (kWh)</b>	<b>21242.95</b>	<b>25589.30</b>	<b>22738.98</b>

Summary			
Current Usage per Year (kWh)	<b>36410.02</b>	<b>39111.57</b>	<b>66200.04</b>
Usage per Year following proposed changes (kWh)	<b>21242.95</b>	<b>25589.30</b>	<b>22738.98</b>
Yearly Savings kWh	<b>15167.08</b>	<b>13522.27</b>	<b>43461.06</b>

The *natural gas savings* are derived from having to heat less water as a result of a reduction in the amount of water lost due to dilution and draining. The natural gas savings have been calculated according to:

$(\text{Hot Water Gal/yr} \times \Delta T \times 8.33\text{lb/gal}) / \text{Efficiency} \times 100,000$  therm conversion

...where,

Water from Dilution:

Venue:	Northside	Veterans Memorial	Erickson
Hot Water (Gal/yr):	242,121	282,124	263,175
Hot Water Supply Temp (°F):	76	82	83
Make-up Water Temp (°F):	55	55	55
Hot Water Efficiency (%):	89%	89%	89%

Water from Draining:

Venue:	Northside	Veterans Memorial	Erickson
Hot Water (Gal/yr):	115,000	134,000	125,000
Hot Water Supply Temp (°F):	120	120	120
Make-up Water Temp (°F):	55	55	55
Hot Water Efficiency (%):	89%	89%	89%

The *water savings* have been calculated according to:

Pool Volume (Gallons) x 1.21% Constant x Days per Year Operation

...where,

Constant (1.21%) is the typical daily dilution percentage for pools of this size range to meet a target of 500ppm TDS.

Venue:	Northside	Veterans Memorial	Erickson
Pool Volume (Gallons):	230,000	268,000	250,000
Days/Year Operation:	87	87	87

It is agreed that these are reasonable values and will not be measured.

### Non-measured Project Benefits

Scope of Work	Location	Year 1 Benefits
Lighting Retrofit	Erickson Pool	\$99
	Northside Pool	\$71
Building Envelope	Fire Station #3	\$537
On-site Hypochlorite Generation	Erickson Pool	\$6,309
	Northside Pool	\$3,660
	Veterans Memorial Pool	\$4,184
Solar PV [Demand]	Fire Station #2	\$2,953
	Fire Station #4 [New]	\$2,953
	La Crosse Center	\$8,973
<b>Total</b>		<b>\$29,739</b>

## Operations and Maintenance Savings

### Lighting Retrofit

- Erickson Pool – Exterior
- Green Island Ice Arena
- Northside Pool – Exterior

Customer shall see a reduction in the cost of lighting materials as a direct result of the implementation of this ECM. O&M cost avoidance for lighting materials derive from the installation of new lighting equipment which include cost avoidance from reduced expenses for lamps and ballasts realized as a result of the replacement of existing fluorescent lamps with LED lamps and the elimination of existing ballast materials. LED lamps have longer rated lives with warranties as indicated in the warranty submittal.

Operations and Maintenance Savings were calculated as follows:

#### *Erickson Pool:*

Quantity = six (6)...4' 2L T8 Strip/vaportight... ESL-T8B4-12W-F150

2 lamps per fixture X 6 Fixtures = 12 Lamps; Assuming 10% yearly replacement @~\$5 per lamp = \$6

1 ballast per fixture at the cost of \$90 each; Assuming 10% yearly replacement =  $6 \times 1 \times 0.1 \times \sim\$90 = \$56$

Labor cost to replace ballast is to be \$60 per ballast replaced:  $\sim\$60 \times 6 \times 1 \times 0.1 = \$37$

Labor cost to replace lamp is to be \$60 per ballast replaced:  $\sim\$60 \times 6 \times 1 \times 0.1 = \$37$

Quantity = forty-two (42)...4' VT 2L 40w PLL... ESL-Ti-VP4RK-S-36W-F40

2 lamps per fixture X 42 Fixtures = 84 Lamps; Assuming 10% yearly replacement @~\$12.5 per lamp = \$108

Labor cost to replace lamp is to be \$60 per ballast replaced:  $\sim\$60 \times 2 \times 42 \times 0.1 \times 0.5 = \$260$

Quantity = twenty-three...(23) 26w 4pin CFL... KT-LED94P-H-840-S

1 lamps per fixture X 23 Fixtures= 23 Lamps; Assuming 10% yearly replacement @~\$4 per lamp = \$10

Labor cost to replace lamp is to be \$60 per ballast replaced:  $\sim\$60 \times 1 \times 23 \times 0.1 \times 0.5 = \$71$

#### *Green Island Ice Arena:*

Quantity = twenty-four (24)... 4' 12L T5 HO... KT-LED25T5HO-48GC-850-DX2

12 lamp per fixture X 24 Fixtures= 288 Lamps; Assuming 10% yearly replacement @~\$5 per lamp X 0.5\* = \$74

6 ballast per fixture at the cost of \$90 each; Assuming 10% yearly replacement =  $24 \times 6 \times 0.1 \times \sim\$100 \times 0.5^* = \$743$

Labor cost to replace ballast is to be \$40 per ballast replaced:  $\sim\$40 \times 24 \times 6 \times 0.1 \times 0.5^* = \$297$

Lift Rental = \$125

\*50% factor applied since facility only operated six months of the year

#### *Northside Pool:*

Quantity = twenty-six (26)...4' 2L T8 fixtures... ESL-T8B4-12W-F150

2 lamps per fixture X 26 Fixtures= 52 Lamps; Assuming 10% yearly replacement @~\$5 per lamp = \$27

1 ballast per fixture at the cost of \$90 each; Assuming 10% yearly replacement =  $26 \times 1 \times 0.1 \times \sim\$90 = \$242$

Labor cost to replace ballast is to be \$28 per ballast replaced:  $\sim\$28 \times 26 \times 1 \times 0.1 = \$74$

### On-site Hypochlorite Generation

- Erickson Pool
- Northside Pool
- Veterans Memorial Pool

Savings = Existing Chlorine Cost – (ChlorKing Cell Replacement + Muriatic Acid + ChlorKing Replacement Parts + Salt)

...where,

Existing Chlorine Cost (per Carrico Aquatic Resources contract)

*Erickson Pool* = \$13,860.00

*Northside Pool* = \$12,600.00

*Veterans Memorial Pool* = \$15,120.00

All Pools:

ChlorKing Cell Replacement Cost (@Year 10) = \$26,400 [\$2,640/yr]

Muriatic Acid (1 gallon per 20 # of chlorine produced)

$((\$4.50/\text{gallon} \times 30 \text{ gallons/day})/20 \text{ # of chlorine}) \times 87 \text{ days/year} = \$587.25$

ChlorKing Replacement Parts (average)

$(\$750/\text{year (Years 3 through 20)}/20 \text{ years}) = \$318.75^{(a)}$

Salt (3 # of salt per 1 # of chlorine produced)

$= (\$0.13/\text{# salt} \times 3 \times (30 \times .65^{**}) \times 87 \text{ days/year}) = \$131.67^{(b,c,d)}$

(a) First three years under warranty

(b) 0.65 = chlorine content of existing tablets used (65%)

(c) Declining scale each of the first five years; no salt required thereafter.

(d) Assumes pool is no longer drained each year but does allow for some lowering of the water level during winter.

ECM	Year 1 Benefits
Lighting Retrofit – Erickson Pool	\$586
Lighting Retrofit – Green Island Ice Arena	\$1,239
Lighting Retrofit – Northside Pool	\$343
On-site Hypochlorite Generation – Erickson Pool	\$10,505
On-site Hypochlorite Generation – Northside Pool	\$9,212
On-site Hypochlorite Generation – Veterans Memorial Pool	\$11,814
<b>Total</b>	<b>\$33,699</b>

### III. MEASUREMENT AND VERIFICATION METHODOLOGIES

The following is a brief overview of the measurement and verification methodologies applicable to the Improvement Measures set forth below. JCI shall apply these methodologies, as more fully detailed in the guidelines and standards of the International Measurement and Verification Protocol (IPMVP).

#### Option A

#### Retrofit Isolation – Key Parameter Measurement

Measured Project Benefits are determined by key parameter measurement of the energy use of the system(s) to which a Facility Improvement Measure (FIM) was applied separate from the energy use of the rest of the facility.

Option A savings are quantified as follows :

Calculated FIM Savings multiplied by a safety factor multiplied by the escalation factor from Schedule IV.

Key parameter measurement means that some but not all parameters will be measured. Careful review of the design and installation of Improvement Measures is intended to demonstrate that the stipulated values fairly represent the probable actual values. Agreed-upon values will be shown in the measurement and verification plan. Engineering calculations using measurements and stipulations are used to calculate Measured Project Benefits for the duration of the Guarantee Term.

Measured Project Benefits from the following Improvement Measures will be calculated using Option A while M&V services are active:

#### ECM-37: Solar PV

- Fire Station #2
- Fire Station #4
- La Crosse Center

The electrical production for this ECM will be verified using IPMVP Option A, Retrofit Isolation with Key Parameter Measurement. The electrical production for this ECM is generated through a production of electricity through the solar photovoltaic arrays; therefore, the measurement boundary is the Solar PV system itself.

Parameter	Measurement Frequency	Measurement Description
Irradiance (kWh/m <sup>2</sup> )	ongoing	The irradiance will be measured using a pyranometer. The value will be totalized, and the totalized value will be recorded on an hourly basis using the system software. Two pyranometers will be installed at the same tilt and azimuth angle as the PV array. One of these pyranometers will be the primary and will have a rated accuracy of +/- 2%. The other pyranometer will be a backup, will have a rated accuracy of +/- 5%, and will be used to fill in any gaps in the irradiance data from the primary pyranometer. The primary pyranometer will be sent to a manufacturer-certified laboratory every two years for recalibration starting year 4.
AC Energy (kWh)	ongoing	The AC energy will be measured using revenue-grade AC meters located near the AC interconnection point of each PV system.

The estimated energy production for this ECM is based on a computer simulation performed using the HelioScope software. Below is the baseline monthly and annual solar irradiance (Plane of Array at Fire Station #2 and Fire Station #4; Global Horizontal at La Crosse Center), based on the NSRDB TMY weather data for La Crosse Municipal Airport. Also shown in the table below is the Year 1 Energy production estimate for the combined output of the PV systems.

<b>PV Array</b>	<b>Baseline Global Incident (Plane of Array) Irradiance (kWh/m<sup>2</sup>)</b>	<b>Baseline Global Incident (Global Horizontal) Irradiance (kWh/m<sup>2</sup>)</b>	<b>Baseline Year 1 AC Energy output (kWh)</b>
Fire Station #2	1,333		56,969
Fire Station #4	1,339		73,609
La Crosse Center		1,263	280,148
<b>Annual Total</b>	---	---	410,726

Below is the Baseline AC Energy Output for the combined PV systems, by Project Year. These numbers include degradation of 3% during the first year then 0.5% per year thereafter from the 2nd until 20th year of the manufacturer's warranty period were accounted for in the savings model.

<b>Project Year</b>	<b>Baseline AC Energy output(kWh)</b>
1	410,726
2	408,672
3	406,629
4	404,596
5	402,573
6	400,560
7	398,557
8	396,564
9	394,582
10	392,609
11	390,646
12	388,692
13	386,749
14	384,815
15	382,891
16	380,977
17	379,072
18	377,176
19	375,291
20	373,414

The energy production guarantee shall assume the monthly baseline (reference) solar irradiance as shown above. On an annual basis (recorded monthly), the total measured AC Energy output of the PV systems will be adjusted based on the actual measured plane-of-array solar irradiance received compared to the baseline (reference) plane-of-array solar irradiance, as per the following formula:

$$P_{Adjusted} = (P_{Measured}) \left( \frac{Q_{reference}}{Q_{actual}} \right)$$

Where P is energy measured in kWh and Q is solar irradiance measured in kWh/m<sup>2</sup>, either the actual measured or the reference as shown. If the adjusted amount of measured energy produced is less than the baseline energy for a given Project Year, the amount of kWh shortfall will be multiplied by the applicable \$/kWh electricity rate for that



Project Year, and the result will be the PV ECM Project Benefit Shortfall for that year. If the adjusted amount of measured energy produced is greater than the baseline energy for a given Project Year, the amount of kWh surplus will be multiplied by the applicable \$/kWh electricity rate for the site for that Project Year, and the result will be the PV ECM Project Benefit Surplus for that year.

**CHANGES IN USE OR CONDITION; ADJUSTMENT TO BASELINE  
AND/OR ANNUAL PROJECT BENEFITS**

Customer agrees to notify JCI, within fourteen (14) days, of (i) any actual or intended change, whether before or during the Guarantee Term, in the use of any facility, equipment, or Improvement Measure to which this Schedule applies; (ii) any proposed or actual expansions or additions to the premises or any building or facility at the premises; (iii) a change to utility services to all or any portion of the premises; or (iv) any other change or condition arising before or during the Guarantee Term that reasonably could be expected to change the amount of Project Benefits realized under this Agreement.

Such a change, expansion, addition, or condition would include, but is not limited to: (a) changes in the primary use of any facility, Improvement Measure, or portion of the premises; (b) changes to the hours of operation of any facility, Improvement Measure, or portion of the premises; (c) changes or modifications to the Improvement Measures or any related equipment; (d) changes to the M&V Services provided under this Agreement; (e) failure of any portion of the premises to meet building codes; (f) changes in utility suppliers, utility rates, method of utility billing, or method of utility purchasing; (g) insufficient or improper maintenance or unsound usage of the Improvement Measures or any related equipment at any facility or portion of the premises (other than by JCI); (h) changes to the Improvement Measures or any related equipment or to any facility or portion of the premises required by building codes or any governmental or quasi-governmental entity; or (i) additions or deletions of Improvement Measures or any related equipment at any facility or portion of the premises.

Such a change or condition need not be identified in the Baseline in order to permit JCI to make an adjustment to the Baseline and/or the Annual Project Benefits. If JCI does not receive the notice within the time period specified above or travels to either Customer's location or the project site to determine the nature and scope of such changes, Customer agrees to pay JCI, in addition to any other amounts due under this Agreement, the applicable hourly consulting rate for the time it took to determine the changes and to make any adjustments and/or corrections to the project as a result of the changes, plus all reasonable and documented out-of-pocket expenses, including travel costs. Upon receipt of such notice, or if JCI independently learns of any such change or condition, JCI shall calculate and send to Customer a notice of adjustment to the Baseline and/or Annual Project Benefits to reflect the impact of such change or condition, and the adjustment shall become effective as of the date the change or condition first arose. Should Customer fail to promptly provide JCI with notice of any such change or condition, JCI may make reasonable estimates as to the impact of such change or condition and as to the date on which such change or condition first arose in calculating the impact of such change or condition, and such estimates shall be conclusive.

#### IV. BASELINE CALCULATIONS AND UTILITY RATES

The unit utility costs for the Baseline period are set forth below as “Base Utility Cost” and represent the average of the utility costs that were used for all calculations made under this Schedule. The Base Utility Cost shall be escalated annually by the actual utility cost escalation but such escalation shall be no less than the mutually agreed “floor” escalation rate of four percent (4%) per year during the first five years and three percent (3%) per year thereafter. The Base Utility Cost for each type of utility represents the 12 month average utility costs from calendar year 2022.

	<b>Electric \$/kWh</b>	<b>Demand \$/kW [On-Pk only]</b>	<b>Natural Gas \$/Therm</b>
<i>La Crosse Center</i>	<b>\$0.0655</b>	<b>\$15.70</b>	
<i>Fire Station 2</i>	<b>\$0.0804</b>	<b>\$12.17</b>	
<i>Fire Station 3</i>	<b>\$0.1405</b>		\$1.00
<i>Fire Station 4</i>	<b>\$0.1408</b>		
<i>Erickson Pool</i>	<b>\$0.0755</b>	<b>\$12.17</b>	\$1.01
<i>Northside Pool</i>	<b>\$0.0752</b>	<b>\$12.17</b>	\$1.01
<i>Veterans Memorial Pool</i>	<b>\$0.1467</b>		\$1.02

##### Solar PV:

The existing utility rate schedules for the Customer's Fire Station #2 and Fire Station #4 facilities will be modified by the Customer's Utility Company by a net-metering schedule that limits the size of renewable resource generators to a maximum of 100 kilowatts (AC) per site. The proposed photovoltaic systems shall remain under this size and allow for utility bill credit equal to the savings as described in Schedule 2a and are based upon the following.

##### Pg-1 Net Energy Billing Service <=100 kW-AC:

Available to all customers who offset retail load with a generation resource 100 kW-AC or less connected behind the meter at their premise, such as rooftop solar.

- Energy: Net metering at full retail rates with monthly banking of excess kWh; any excess kWh at year end is paid out using on-peak and off-peak energy prices shown within the Pg-2B tariff.
- Capacity & Transmission Credits: Not provided.

The proposed La Crosse Center photovoltaic system size will exceed 100 kilowatts (AC) but not exceed 200 kilowatts (AC), therefore, the existing rate schedules for the Customer's facilities will be modified by the Customer's Utility Company to Pg-2B Sale to Company After Self Supply. Excess energy generated under this arrangement must be delivered to the grid. Customer will realize benefit as described below.

##### Pg-2B Sale to Company After Self Supply <=1 MW-AC:

Available to any generator certified as a “Qualifying Facility” under Part 292 of PURPA with a nameplate capacity of 1,000 kW-AC or less. Generation may be used to offset retail load and excess generation is purchased by Xcel Energy without a contract as follows:

- Energy: Excess kWh are adjusted for loss factors and credited at wholesale locational marginal prices (LMPs) averaged across summer peak, winter peak, and off-peak periods; the forecasted LMPs are updated annually and approved by the Public Service Company of Wisconsin.
- Capacity: No credits paid
- Transmission: All kWh are adjusted for loss factors and credited at avoided transmission costs.

## **V. PRIMARY OPERATIONS SCHEDULE PRE & POST RETROFIT**

There is no anticipated change to the operating hours at the facilities included in this agreement.

## VI. MEASUREMENT & VERIFICATION SERVICES

JCI will provide the M&V Services set forth below in connection with the Assured Performance Guarantee.

1. During the Installation Period, a JCI Performance Assurance Specialist will track Measured Project Benefits. JCI will report the Measured Project Benefits achieved during the Installation Period, as well as any Non-Measured Project Benefits applicable to the Installation Period, to Customer within 60 days of the commencement of the Guarantee Term.
2. Within 60 days of the first anniversary of the commencement of the Guarantee Term, JCI will provide Customer with an annual report containing:
  - A. an executive overview of the project's performance and Project Benefits achieved to date;
  - B. a summary analysis of the Measured Project Benefits accounting; and
  - C. depending on the M&V Option, a detailed analysis of the Measured Project Benefits calculations.
3. During Year One of the Guarantee Term only, a JCI Performance Assurance Specialist will monitor the on-going performance of the Improvement Measures, as specified in this Agreement, to determine whether anticipated Measured Project Benefits are being achieved. In this regard, the Performance Assurance Specialist will periodically assist Customer, on-site or remotely, with respect to the following activities:
  - A. review of information furnished by Customer from the facility management system to confirm that control strategies are in place and functioning;
  - B. advise Customer's designated personnel of any performance deficiencies based on such information;
  - C. coordinate with Customer's designated personnel to address any performance deficiencies that affect the realization of Measured Project Benefits; and
  - D. inform Customer of opportunities to further enhance project performance and of opportunities for the implementation of additional Improvement Measures.
4. For specified Improvement Measures, JCI will:
  - A. conduct pre and post installation measurements required under this Agreement;
  - B. confirm the building management system employs the control strategies and set points specified in this Agreement; and
  - C. analyze actual as-built information and adjust the Baseline and/or Measured Project Benefits to conform to actual installation conditions (e.g., final lighting and water benefits calculations will be determined from the as-built information to reflect the actual mix of retrofits encountered during installation).
  - D. confirm that the appropriate metering and data points required to track the variables associated with the applicable Improvement Measures' benefits calculation formulas are established; and
  - E. set up appropriate data capture systems (e.g., trend and totalization data on the facility management system) necessary to track and report Measured Project Benefits for the applicable Improvement Measure.
    - i. Trend data records maintained in the ordinary course of system operation may be used and relied upon by Subcontractor in connection with Project Benefits calculations, as well as in other commercial uses relating to building system performance. Subcontractor will use commercially reasonable efforts to ensure the integrity of the data collected to calculate the required metrics. In the event data is lost due to equipment failure, power failure or other interruption in data collection, transmission or storage, Subcontractor will use reasonable engineering methods to estimate the impact of or replace the lost data.

## CUSTOMER RESPONSIBILITIES

In order for JCI to perform its obligations under this Agreement with respect to the Work, the Assured Performance Guarantee, and the M&V Services, Customer shall be responsible for the following in addition to Customer Responsibilities outlined in Schedule 3 of the Agreement dated April 23, 2019 and as amended in prior Change Orders:

1. Providing JCI, its subcontractors, and its agents reasonable and safe access to all facilities and properties that are subject to the Work and/or M&V Services;
2. Providing for shut down and scheduling of affected locations during installation as needed to accomplish the Work and/or M&V Services;
3. Providing timely reviews and approvals of design submissions, proposed change orders, and other project documents;
4. Promptly notifying JCI of any change in use or condition described in Section III of Schedule 2e or any other matter that may impact the Assured Performance Guarantee;
5. Taking all actions reasonably necessary to achieve the Non-Measured Project Benefits;
6. Provide all chemicals required for pool operation

## PRICE AND PAYMENT TERMS

Customer shall make payments to JCI pursuant to this Schedule 4e.

1. Work. The price to be paid by Customer for the Work described in Schedule 1e shall be \$2,390,502. Payments (including payment for materials delivered to JCI and work performed on and off-site) shall be made to JCI as follows:

First payment due:	50%	\$1,195,251 due October 20, 2023
Second payment due:	10%	\$239,050 due November 30, 2023
Third payment due:	10%	\$239,050 due December 30, 2023
Fourth payment due:	10%	\$239,050 due January 30, 2024
Fifth payment due:	10%	\$239,050 due February 28, 2024
Sixth payment due:	5%	\$119,525 due June 30, 2024
Final payment due:	5%	\$119,526 due July 30, 2024

If construction is delayed the payment schedule above may be adjusted accordingly.

2. M&V Services. The total price for JCI's additional M&V Services, included in Paragraph 1 above, as detailed on Schedule 2e of this Agreement, is \$12,500. The term of this M&V Services Agreement is 1 year.

At the end of Project Benefits Year 1, as described in Schedule 2e, the M&V will transition to stipulated benefits for the remainder of the Guarantee Term. During Year 1, the Customer may elect to continue Option A at the current pricing with an annual escalation rate of three percent (3%).

**NOTICE TO PROCEED**

Johnson Controls, Inc.  
12000 West Wirth Street  
Wauwatosa, Wisconsin 53222  
ATTN: Jim Bieser

Re: Notice to Proceed for 2PZK-0052 City of La Crosse PC – Buildings, Change Order No. 5

Dear Jim Bieser:

This Notice to Proceed is being issued by City of La Crosse, WI (“Customer”) to Johnson Controls, Inc. (“JCI”) pursuant to that certain Performance Contract entered into between Customer and JCI for the purpose of notifying JCI to commence work under such contract.

In the event that this Notice to Proceed is delivered by Customer prior to the execution of the Performance Contract by Customer and JCI, Customer understands and expects JCI will incur significant costs and expenses in complying with this Notice to Proceed. In the event the Performance Contract is not executed by the parties, for any reason, Customer agrees to pay JCI for its costs and fees incurred in complying with this Notice to Proceed on a time and material basis. Customer also agrees JCI shall be entitled to a reasonable markup thereon for profit and overhead. Customer agrees to pay amounts billed by JCI no later than five (5) days after Customer receives JCI’s payment application. JCI will continue to submit payment applications to Customer until the Performance Contract is executed. Once the Performance Contract is executed, JCI will begin submitting its payment applications to Customer in accordance with the terms and conditions set forth therein. Any amounts already paid by Customer will be credited towards the Performance Contract price.

By signing and dating this Notice to Proceed, the parties hereto agree to these terms and represent and warrant they have the authority to execute this Notice to Proceed on behalf of their respective organizations.

**City of La Crosse, WI (“Customer”)**

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

Printed Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

**ACKNOWLEDGED & AGREED TO:**

**JOHNSON CONTROLS, INC.**

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

Printed Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

**CERTIFICATE OF SUBSTANTIAL COMPLETION**

**PARTIES:** JOHNSON CONTROLS, INC. ("JCI")  
507 East Michigan Street  
Milwaukee, Wisconsin 53202

City of La Crosse, WI ("Customer")  
400 La Crosse St  
La Crosse, Wisconsin 54601

**PROJECT:** 2PZK-0052 City of La Crosse PC – Buildings, Change Order No.5; Performance Contract dated April 23, 2019 between JCI and Customer

By executing this Certificate of Substantial Completion, Customer acknowledges the following:

- a. The work set forth in the Performance Contract Change Order is substantially complete.
- b. Customer has received the manuals, warranty information, and training required under the Performance Contract.
- c. The following punch list items must be completed by JCI (check as applicable):

- punch list attached
- punch list complete

- d. Upon completion of the punch list items, or if such punch list items are complete, JCI and Customer shall sign the Certificate of Final Completion attached hereto.

Dated [redacted], 20 [redacted].

**CUSTOMER:**

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

Printed Name: \_\_\_\_\_

Title: \_\_\_\_\_

**JOHNSON CONTROLS, INC.**

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

Printed Name: \_\_\_\_\_

Title: \_\_\_\_\_



### CERTIFICATE OF FINAL COMPLETION

**PARTIES:** JOHNSON CONTROLS, INC. ("JCI")  
507 East Michigan Street  
Milwaukee, Wisconsin 53202

City of La Crosse, WI ("Customer")  
400 La Crosse St  
La Crosse, Wisconsin 54601

**PROJECT:** 2PZK-0052 City of La Crosse PC – Buildings, Change Order No.5; Performance Contract dated April 23, 2019 between JCI and Customer

By executing this Certificate of Final Completion, Customer acknowledges the following:

- a. The work set forth in the Performance Contract Change Order has been reviewed and determined by Customer to be fully complete.
- b. Customer accepts the work as complete and hereby releases JCI's obligations under any performance and payment bonds posted for the project as of the date set forth below.

Dated [redacted], 20 [redacted].

**CUSTOMER:**

**JOHNSON CONTROLS, INC.**

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

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

Printed Name: \_\_\_\_\_

Printed Name: \_\_\_\_\_

Title: \_\_\_\_\_

Title: \_\_\_\_\_