

Attachment B.1:

**Attachments to
Form of GESC**

ATTACHMENT I

To

GUARANTEED ENERGY SAVINGS CONTRACT

EXHIBITS

Exhibit I	Performance Bond/Construction Bond
Exhibit II (i)	Certificate of Substantial Completion
Exhibit II (ii)	Certificate of Final Acceptance
Exhibit III	Indicative Prevailing Wage Rate Schedule
Exhibit IV	Economic Opportunity Requirements
Exhibit V	Permitted Energy Escalation Rates
Exhibit VI	Form of Notice to Proceed
Exhibit VII	Form of Project Price Proposal
Exhibit VIII	Service and Technical Requirements
Exhibit IX	[Form of Lease]

Exhibit X Contract Deliverables

Exhibit XI Form of Application for Payment

Exhibit XII. Requirements for Critical Path Schedule

Exhibit I

Forms of Performance Bond and Construction Bond

[Preferred form to be provided]

Exhibit II

Exhibit II (i) Certificate of Substantial Completion

[Preferred form to be provided]

Exhibit II (ii) Certificate of Final Acceptance

[Preferred form to be provided]

Exhibit III

Indicative Prevailing Wage Rate Schedule

[To be provided]

Exhibit IV

Economic Opportunity Requirements

[To be provided]

Exhibit V

Permitted Energy Escalation Rates

Electricity escalation rate will be 1.5% annually for the contract period.

Exhibit VI

Form of Notice to Proceed

[Preferred form to be provided]

Exhibit VII

Form of Price Proposal

[illegible]

Exhibit VIII

Service and Technical Requirements

[As defined in the RFP document]

Exhibit IX

Form of Lease

[Preferred form to be provided]

Exhibit X

Contract Deliverables

Schedules

To be prepared in accordance with Article 3.

Design and Engineering Documents

To the extent applicable, preliminary design documents consisting of design criteria, preliminary design drawings, outlining specifications and other documents to fix and describe the size, quality and character of the Project Equipment, its structural, mechanical and electrical systems, and the materials and other elements of the Equipment installations as may be appropriate.

To the extent applicable, construction documents including technical drawings, schedules, diagrams and specifications, job books containing calculations used in the final design, but excluding shop drawings, setting forth in detail the requirements for construction of the ECM Installations that—

- establish the scope of the Equipment installations in greater detail;
- provide information necessary for the use of those in the building trades; and
- include documents necessary for regulatory agency approval.

To the extent applicable, record or as-built drawings showing significant changes made during construction.

Operation Manuals

The Operation Manuals shall (a) include the full technical information and non-technical explanations so the City can use and operate each item of Project Equipment for its intended purpose, (b) the operation and maintenance requirements for each item of Equipment and (c) at a minimum, include the following to the extent applicable:

- operation and maintenance requirements applicable to all portions of the Equipment, and minimum and maximum operating ranges of all Equipment;
- sequence of events required for startup, operation and shutdown of all Equipment under normal and emergency conditions;
- interrelationship of items of Equipment and processes;
- routine maintenance activities and schedule for all Equipment necessary for the continuous safe and efficient operation of the Equipment installations, including the type, quantity and sources of materials required for such maintenance; and
- list of recommended spare parts.

Exhibit XI

Form of Application for Payment

To: Philadelphia Energy Authority (“**PEA**”)

From: [] (the “**ESCO**”)

Pursuant to Section 8.2 of the Guaranteed Energy Savings Contract, dated as of [] [], 20[] between the PEA and the ESCO (the “**Contract**”), the ESCO hereby applies for Amount Payable set forth below, such amount representing the amount due for having achieved the milestones identified below.

Milestones [list separately]	Payment Amount [list separately]
Total Milestone Amounts	
Less [●]% Retainage	
Amount Payable	

On behalf of the ESCO, I hereby certify as follows:

1. the Work for which payment is sought (a) has been performed to the extent indicated in this Application for Payment, as determined pursuant to **Schedule D (ESCO Compensation and Milestone Payment Schedule)** of the Contract, and substantially in

accordance with the Contract and (b) has not been the subject of a previous Application for Payment;

2. there are no liens or encumbrances on the City Lighting Property or the City Street Lighting System arising from the performance of the Work; and

3. the Contract is in full force and effect and no event of default on the part of the ESCO exists thereunder and no event or condition exists that, with the giving of notice or the passage of time, would constitute such an event of default.

Capitalized terms used in this Application for Payment are defined in the Contract.

[ESCO]

By: _____
Authorized Representative

Exhibit XII

Requirements for Critical Path Schedule

[This schedule sets out the City's requirements for the software and other criteria for presentation and communication of the critical path schedule.]

ATTACHMENT II

to

GUARANTEED ENERGY SAVINGS CONTRACT

SCHEDULES

Background

Schedule A	Scope of Work
Schedule B	Description of City Lighting Systems; Pre-Existing Lighting and Lighting Controls Inventory

Savings Guarantee and Payments

Schedule C	Energy Saving Guarantee
Schedule D	ESCO Compensation and Milestone Payment Schedule
Schedule E	Baseline Energy Consumption; Baseline Adjustments
Schedule F	Measurement and Verification
Schedule G	Analysis of Final Project Costs and Final Project Cash Flow
Schedule H	Prevailing Wage Rates

Schedule I [Intentionally Left Blank]

Implementation Phase

Schedule J Implementation Schedule

Schedule K Commissioning and Integration Plan

Schedule L Standards of Illumination and Control

Schedule M ESCO's Training Responsibilities

Schedule N Waste and Hazardous Material Removal Responsibilities

Schedule O City Approved Subcontractor List

Schedule P Economic Opportunity Plan

Operation Phase

Schedule Q ESCO's System Service Responsibilities

Schedule R City's System Service Responsibilities

Schedule S System Service Responsibilities Checklist

Schedule T Annual Reporting Requirements

Schedule A through Schedule C

[See Schedules A through Schedule C of the Investment Grade Audit Report]

Schedule D

ESCO Compensation and Milestone Payment Schedule

Insert final ESCO price proposal based on RFP bids as further negotiated in the Audit/Design Period. Include fixed price bids for luminaires, changes such as wiring and change order overhead for non-fixed price changes. Include M&V Fee.

Milestone Schedule

This schedule lists construction milestones against which payment will be made. The list can be detailed so as to permit payment for small increments of construction. Each milestone must be capable of independent audit and not based on judgment. Percent complete is not an auditable standard unless based on installation of a specific number of units of identical material or equipment against a fixed total of such units in the Scope of Work.

Schedule E

Baseline Energy Consumption; Baseline Adjustments

[From Audit Report]

Schedule F

Measurement & Verification Plan

Instructions for Completion of the Savings Measurement & Verification Plan

This Schedule should be based on the monitoring and verification (M&V) definitions, standards and measurement methods adopted by the International Performance Measurement & Verification Protocol (“**IPMVP**”), currently maintained and managed by the Efficiency Valuation Organization. The U.S. Department of Energy led the effort to create the IPMVP and its “M&V Guidelines:

Measurement and Verification for Federal Energy Projects Version 3.0” follows the IPMVP definitions, standards and measurement methods

Key concepts of the IPMVP which are important to PennSEF Participants:

- **Baseline Period:** The period chosen to represent operation of the facility or system before implementation of an ECM. For PennSEF, the Baseline Period is normally to be based on three years of utility data.
- **Reporting Period:** The period following implementation of an ECM when savings reports adhere to the IPMVP. PennSEF Participants and the PennSEF Program are to

receive quarterly and annual reports during the period of debt service for each measure or blended measure.

- **Types of Savings:** Generally, two types of savings are defined by the IPMVP:
 - *Avoided Energy/Water Use*
The reduction in energy/water use occurring in the reporting period, relative to what would have occurred if the facility had been equipped and operated as it was in the baseline period. Cost avoidance is the monetary equivalent of avoided energy/water use.
 - *Normalized Savings*
The reduction in energy/water use or cost occurring in the reporting period, relative to what would have occurred if the facility had been equipped and operated under a normal set of conditions that may be defined as a long term average. Normal conditions may also be set as those prevailing during the baseline period, especially if they were used as the basis for predicting savings.
- **Measurement and Verification (M&V):** The process to reliably determine actual savings within a facility, system or equipment by comparing resource use before and after implementation of a project.

The City adopts the four M&V Options defined by the IPMVP for the measurement of energy and water savings. These are briefly summarized here:

- **Option A: Retrofit Isolation 1**
 - Based on a measurement of one key parameter.
 - Equation:
$$\text{Savings} = \text{Stipulated Value} \times [\text{Lifetime in years of the installed measure}]$$
 - Cost of performing Option A is usually less than other options.
 - Common Applications: Lighting
- **Option B: Retrofit Isolation 2**
 - Measures all major parameters relevant to the performance of the retrofit.
 - Equation:
$$\text{Savings} = [\text{Baseline Period Energy/Water Use}] - [\text{Reporting Period Energy/Water Use}]$$
 - Cost of performing Option B is typically more costly than Option A.
 - Common Applications: Boilers or other devices whose resource use can be isolated from other devices or activities contributing to a site's or all resource use.
- **Option C: Whole Facility**
 - Involve the use of utility meters, whole-facility meters or sub-meters.
 - Equation:

$$\begin{aligned} \text{Savings} = & [\text{Baseline Period Energy/Water Use}] \\ & - [\text{Reporting Period Energy/Water Use}] \\ & \pm f(\text{weather, occupancy, facility use, etc.}) \end{aligned}$$

- Cost of Option C depends on the source of the energy data, and the difficulty of tracking static factors. It may adjust for changes in such factors as weather, occupancy, and facility use. Typically, the cost of performing Option C M&V is more costly than that for Options A or B but the latter may not be relevant or useful to measuring savings for which Option C has been designed.
- Common Applications: Where energy performance of the whole facility will be assessed, not only the performance of the ECMs.
- **Option D: Calibrated Simulation**
 - Estimate facility energy use based on computer simulation with detailed comparisons made to calibration data.
 - Equation:

$$\begin{aligned} \text{Savings} = & [\text{Baseline energy/water/wastewater from the calibrated model without ECMs}] \\ & - [\text{Reporting period energy/water from the calibrated model with ECMs}] \end{aligned}$$
 - If actual energy data are available for either baseline or reporting period,

$$\begin{aligned} \text{Savings} = & [\text{Baseline energy/water/wastewater from the calibrated model without ECMs}] \\ & - [\text{Actual calibration-period energy/water (with ECMs)}] \\ & \pm [\text{Calibration error in the corresponding calibration reading}] \end{aligned}$$
 - Option D is costly due to challenges of accurate computer modeling and calibration.
 - Common Applications: Where energy data of either baseline or reporting period, but not both, are unavailable or unreliable, such as a new or significantly remodeled or repurposed facility.

For purposes of calculations based on measured commodity unit savings the commodity escalation rates set forth in Schedule C (Savings Guarantee) (which may not exceed those set forth in Exhibit 8 (Form of Savings Estimate)) shall be used to establish the energy price for each Savings Year that is multiplied by actual commodity unit savings. Contractor is not responsible for and does not receive benefit for savings based on actual commodity prices.

SUMMARY OF IPMVP OPTIONS

IPMVP Option	How Savings Calculated	Typical Applications
A. Retrofit Isolation: Key Parameter Measurement	Measurements of key operating parameters of baseline and reporting period; routine adjustments are mainly considered.	A lighting retrofit.
B. Retrofit Isolation: All Parameter Measurement	Same as above, plus engineering computations or proxies of energy use.	A variable-speed drive and controls to motor to adjust pump flow.
C. Whole Facility	Analysis of whole facility baseline and reporting period meter data; routine and non-routine adjustments need to be considered.	A facility where multifaceted energy management programs affect many systems.
D. Calibrated Simulation	Energy use simulation and calibration with hourly or monthly utility billing data.	A facility with many systems affected by multifaceted energy program but no meter in baseline period.

Determining which of the four IPMVP Options to use for a particular Project requires careful consideration of several factors. Generally speaking, accuracy improves when Options B-D are used, compared to Option A; but so does M&V cost. If a Project involves uncertainties which could affect their economics, Options C&D can better capture the effects of risk.

The City offers the following Guidelines with the caveat that many factors need to be considered and, therefore, the Guidelines may not be suitable in specific cases.

GUIDELINES FOR CHOOSING IVMVP OPTIONS: BALANCING UNCERTAINTY AND COSTS

- **Low Energy Savings Variation & Low- to Moderate-Cost CM**
 - *Option A may be preferred especially if the reporting period is short.*
- **Possible High Energy Savings Variation & Low- to Moderate-Cost CM**
 - *Option B may be preferred due to the relatively low cost of M&V especially if uncertainty of performance is low.*
- **Low Energy Savings Variation & High-Cost CM**
 - *Option C may be preferred due to lower M&V cost than Option D while being able to render accurate estimates of savings which are expected to be high.*
- **High Energy Savings Variation & High-Cost CM**
 - *Options C and D may be preferred on accuracy and uncertainty grounds, with Option D possibly preferred because of its ability to rigorously address accuracy and uncertainty issues.*

The City requires Participants to demonstrate for the appropriate Option(s) that the Energy and Water Savings of the Project shall be greater than the sum of annual debt service and annual fees to the Contractor, the Issuer (if any) and the Trustee.

The IPMVP manual and related documents can be found at http://www.evo-world.org/index.php?option=com_content&view=article&id=272&Itemid=379&lang=en.

Schedule G and Schedule H

[See Schedules G and Schedule H of the Investment Grade Audit Report]

Schedule K

Commissioning and Integration Plan

- Commissioning of each item of Equipment installation in accordance with manufacturer's requirements, Applicable Codes and applicable standards.
- Safety inspection and testing of all wiring connections and safety monitoring or risk prevention measures, including safety shut-off or pressure release equipment, for circulation or use of electricity and all mechanical systems.
- Testing of all Equipment to demonstrate the full range of required function.
- Testing of each integrated system that includes one or more new items of Equipment to demonstrate performance consistent with achieving the Guaranteed Savings and Standards of Illumination and Control without interruption over a statistically significant period.
- Demonstrating compliance with all Applicable Law and permit requirements during the entire testing period.

Schedule L through Schedule T

[From Audit Report]