



Exhibit A – Scope of Work
ENERGY ASSESSMENT (EA)

TABLE OF CONTENTS

A.	Introduction.....	2
B.	High-level Summary of Energy Assessment EA Process	3
1.	Preliminary Coordination Meeting, Facility Energy Assessment, and Data Collection.....	3
2.	Preliminary Energy-Use Analysis (PEA) and/or ASHRAE Level 1 Analysis	3
3.	Energy Survey Analysis (ASHRAE Level 2).....	3
4.	Detailed Analysis of Capital-Intensive Modifications (ASHRAE Level 3)	4
5.	Targeted Energy Assessments	4
6.	Energy Performance Design Phase Proposal.....	4
7.	Measurement and Verification Plan	4
C.	Requirements	5
1.	Allowable Cost and Savings Factors approved for consideration:	5
2.	Third-Party M&V Monitor.....	5
D.	Detailed Task List.....	5
1.	Preliminary Energy-Use Analysis (PEA)	5
2.	Data Collection and ASHRAE Level 1 Analysis	5
3.	Baseline Establishment.....	7
4.	Preliminary Analysis of Measures (ASHRAE Level 2)	8
5.	Meeting(s) with DASNY and the Client to Present Findings.....	9
6.	Savings Analysis	9
7.	Cost Estimates	10
8.	Measurement and Verification	10
9.	Commissioning.....	10
10.	Reports	10
11.	Review and Finalization of EA	12
12.	Energy Performance Contractor’s Design Services and/or Implementation Contract Proposal	12
13.	Review	13
E.	Appendix.....	14
1.	ATTACHMENT A. Sample Assessment Workplan Approval Matrix	14
2.	Abbreviations	16

Exhibit A
Scope of Work

A. Introduction

The following will serve to define the criteria to be followed and requirements to be met in the performance of an Energy Assessment being performed under the Energy Performance Contract. The CONTRACTOR shall perform all services as required to complete the processes applicable to the completion of Energy Assessment(s) (EAs) as required to meet the intent of the project. The EAs being performed by the CONTRACTOR shall meet or exceed the standards and requirements under the applicable ASHRAE Levels described below and/or as modified in this Exhibit. Where this Exhibit or ASHRAE contain differing provisions or requirements with respect to the same subject matter, the provisions that establish the higher quality, method of performing the work, or better performance, or that establish more stringent standards, will prevail.

The matrix presented in Table 1 is a general representation of the tasks required for each level of effort.

Table 1 — Energy Audit Required Tasks*

Process	Level			
	1	2	3	Targeted
Conduct PEA	•	•	•	•
Conduct walk-through survey	•	•	•	•
Identify low-cost/no-cost recommendations	•	•	•	•
Identify capital improvements	•	•	•	•
Review mechanical and electrical (M&E) design and condition and O&M practices	□	•	•	•
Measure key parameters	□	•	•	•
Analyze capital measures (savings and costs, including interactions)	□	•	•	•
Meet with owner/operators to review recommendations	□	•	•	•
Conduct additional testing/monitoring	□	□	•	•
Perform detailed system modeling	□	□	•	•
Provide schematic layouts for recommendations	□	□	•	•
Process	Level			
	1	2	3	Targeted
Estimate savings from utility rate change	•	•	•	•
Compare EUI to EUIs of similar sites	•	•	•	•
Summarize utility data	•	•	•	•
Estimate savings if EUI were to meet target	•	•	•	•
Estimate low-cost/no-cost savings	□	•	•	•
Calculate detailed end-use breakdown	□	•	•	•
Estimate capital project costs and savings	□	•	•	•
Complete building description and equipment inventory	□	•	•	•
Document general description of considered measures	□	•	•	•
Recommend measurement and verification (M&V) method	□	•	•	•
Perform financial analysis of recommended EEMs	□	•	•	•
Write detailed description of recommended measures	□	□	•	•
Compile detailed EEM cost estimates	□	□	•	•

*Based on Table 1 – Energy Audit Required Tasks, ASHRAE Procedures for Commercial Building Energy Audits, Second Edition.

B. High-level Summary of Energy Assessment EA Process

This will be an interactive approach in working with DASNY and the Client, following the process summarized below, and described in further detail in the following sections.

1. Preliminary Coordination Meeting, Facility Energy Assessment, and Data Collection

- a) The CONTRACTOR shall participate in an initial meeting (the "**Preliminary Coordination Meeting**") to discuss the approach to delivering the EA and the respective responsibilities of the parties involved. The CONTRACTOR shall prepare an agenda and conference record to include agenda items provided by the parties involved, which may include: a review of the project scope and client expectations, facility's operational and maintenance protocols/procedures, operational constraints of existing systems/equipment, availability of facility systems documentation, etc.
- b) The CONTRACTOR will deliver an agenda to DASNY in accordance with, which will include at least the following topics:
 - i. The CONTRACTOR's approach to collecting data and background information on the Facilities
 - ii. The CONTRACTOR's process for performing a preliminary walk-through of the Facilities and interviewing the Owner's staff and occupants to identify potential ECMs
 - iii. Overall schedule for delivering the services under the EA
- c) The CONTRACTOR shall submit an Energy Assessment Report (the "**Assessment Report**") for DASNY's approval within 10 days of the Preliminary Coordination Meeting. Once the Assessment Report is approved, the CONTRACTOR will conduct interviews with the Facility's staff, review relevant Facilities' data and records and conduct surveys of the physical Facilities, as appropriate and in accordance with the Assessment Report.

2. Preliminary Energy-Use Analysis (PEA) and/or ASHRAE Level 1 Analysis

- a) The CONTRACTOR shall prepare and present a preliminary analysis at agreed upon intervals (e.g., 25%, 50% and 75% complete). The purpose of these reports will be to confirm the CONTRACTOR is performing the assessment in accordance with the approved Assessment Report and to establish agreement on ECMs to further analyze at each iteration of development
- b) Meeting(s) with DASNY and the Client/operators will be held to present the preliminary findings and analyses.
- c) Prepare and deliver a PEA and/or Level 1 Report.
- d) Submittals, Approvals, Decision Points
 - i. PEA and/or Level 1 report, including proposed M&V and commissioning plans.
 - ii. Assessment Workplan Approval Matrix (Sample provided in Attachment A)
 - iii. Establish agreement with DASNY and the Client on measures to further analyze.
 - iv. Establish agreement with DASNY and the Client on decisions for measures to potentially conduct targeted audits.

3. Energy Survey Analysis (ASHRAE Level 2)

- a) Develop the Level 2 Report at each of the intervals described the Agreement and establish agreement on ECMs to further analyze at each iteration of development
- b) Meeting(s) with DASNY and the Owner/operators to present findings.
- c) Prepare and deliver a Level 2 Report.
- d) Submittals, Approvals, Decision Points
 - i. Level 2 Report, including proposed Capital Intensive Modifications, M&V and commissioning plans.
 - ii. Assessment Workplan Approval Matrix (Sample provided in Attachment A of and Project Proposal)
 - iii. Establish agreement with DASNY and the Owner on recommendations and measures to further analyze, including decisions to potentially conduct targeted audits.

4. Detailed Analysis of Capital-Intensive Modifications (ASHRAE Level 3)

- a) Prepare schematic layouts for the recommended measures, perform required system modeling, write detailed ECM descriptions, and compile detailed cost information as required to complete the Level 3 Final Report.
- b) Meeting(s) with DASNY and the Owner/operators to present final recommendations and establish agreement on ECMs to implement.
- c) Prepare and deliver a Level 3 Final Report.
- d) Submittals, Approvals, Decision Points
 - i. Level 3 Final report, including Capital-Intensive Modifications, and M&V plans.
 - ii. Assessment Workplan Approval Matrix (Sample provided in Attachment A of the EA and Project Proposal)
 - iii. Establish agreement with DASNY and the Client on final recommendations and measures, including decisions to potentially conduct targeted audits.

5. Targeted Energy Assessments

- a) Meeting(s) with DASNY and the Client/operators to present preliminary and final recommendations, measures, and objectives.
- b) The Client may identify targeted assessments resulting from or in addition to proceeding audits. The level of effort may be tailored to the needs of the facility, for specific systems, subsystems, or equipment.
- c) Targeted assessments primarily rely on measurements, data logging, trend data to provide a check on the energy use estimates in the base case.
- d) Prepare and deliver Targeted Assessments/EAs Preliminary and Final Reports.
- e) Submittals, Approvals, Decision Points
 - i. Targeted EA report, which can be combined with the final audit report from Level 1, 2, and/or 3.
 - ii. Assessment Workplan Approval Matrix (Sample provided in Attachment A of the EA and Project Proposal)
 - iii. Meet with Owner to finalize ECMs and EPC design phase proposal submission.

6. Energy Performance Design Phase Proposal

- a) Prepare project proposal for DASNY and the Client, for review
- b) Meet with DASNY and the Client to present results and agree upon the scope of design phase services.
- c) Finalize and submit the final proposal, including the final EA report(s), for DASNY and the Owner's approval.

7. Measurement and Verification Plan

A measurement and verification (M&V) Plan shall typically be developed in EA process to ensure that the performance of the ECMs achieves the forecasted facility and/or process performance requirements. The accepted M&V Plan shall be made a part of the final EA report(s) and will be incorporated under the Energy Performance Contract.

C. Requirements

For more detailed task list, refer to Department of Energy's guidelines for energy assessments, and ASHRAE Procedures for Commercial Building Energy Audits, 2nd Edition.

1. Allowable Cost and Savings Factors approved for consideration:

DASNY will provide CONTRACTOR with sufficient guidance to develop savings estimates.

- a) Payment sources that can be incorporated in the Installation Assessment's Proposal, subject to the Owner's review and approval:
 - i. Energy and water cost savings
 - ii. Material/commodity savings, including scheduled replacement of parts (only for years that these cost savings are applicable)
 - iii. Outside labor cost savings, including maintenance contracts
 - iv. Outside incentive funds (utility incentives, grants, etc.)
 - v. Any savings related to maintenance and operation of the facilities will be limited to those that can be thoroughly documented.
- b) Payment sources that may also be considered and negotiated between the Parties:
 - i. In-house labor costs
 - ii. Deferred maintenance cost
 - iii. Offset of future capital cost
 - iv. Health or productivity benefits
 - v. Owner cash outlay
- c) Additional factors related to establishing savings that cover all costs:
 - i. Escalation rates should be applied independently to each payment source: gas, water, operating savings, etc. These rates will be agreed upon at the start of the audit and used in cash flow projections for project development purposes.¹
 - ii. Interest rates (municipal tax-exempt rates for public institutions)
 - iii. Owner cash outlay (as provided in the Owner's sole discretion)

2. Third-Party M&V Monitor

DASNY shall hire an independent third-party monitor to review the CONTRACTOR's monitoring and verification reports and advise DASNY and the Client of compliance in monitoring and verifying savings.

D. Detailed Task List

1. Preliminary Energy-Use Analysis (PEA)

The Preliminary Energy-Use Analysis (PEA) is a prerequisite for any audit, as outlined below:

- a) Analyze the historic utility use, peak demand, and cost
- b) Develop the Energy Cost Index (ECI) of the building.
- c) Develop the Energy Utilization Index (EUI).
- d) Compare the building EUI to similar buildings' EUIs to assess the potential for improved energy performance and the extent of further engineering study necessary to produce significant energy savings

2. Data Collection and ASHRAE Level 1 Analysis

The CONTRACTOR shall collect data and background information from DASNY and the Client concerning the Facility's operation and energy use for the most recent three years from the effective date of the EA in a manner that covers at least the following:

¹ NTD: Federal government guidelines on utility escalation rates should be utilized.

- a) Building list with square footage and age (including age of major remodels or additions)
- b) Construction data of buildings and major additions including building envelope, window specifications / performance and roof/wall assembly.
- c) Utility company invoices
- d) Occupancy schedules and usage information
- e) Description of all energy and water-consuming or energy and water-saving equipment used on the premises, as available
- f) Description of energy management procedures utilized on the premises
- g) Description of current operational procedures
- h) Description of any energy-related improvements made or currently being implemented
- i) Description of any changes in the structure of the Facility or energy-using or water-using equipment
- j) Description of future plans regarding building modifications or equipment modifications and replacements
- k) Drawings, as available (may include mechanical, plumbing, electrical, building automation and temperature controls, structural, architectural, modifications and remodels)
- l) Original construction submittals and factory data (specifications, pump curves, etc.), as available
- m) Operating engineer logs, maintenance work orders, etc., as available
- n) Records of maintenance expenditures on energy-using equipment, including service contracts
- o) Prior energy audits or studies, if any

Where information is not available from the Client or DASNY, the CONTRACTOR will make a diligent effort to collect such information through the facility inspection, staff interviews, and utility companies. As may required, DASNY may authorize the installation of data collection and monitoring equipment.

CONTRACTOR agrees to work diligently to assess validity of information provided and to confirm or correct the information as needed.

The CONTRACTOR must compile an inventory based on a physical inspection of the major electrical and mechanical systems at the Facility, including:

- a) Cooling systems and related equipment
- b) Heating and heat distribution systems
- c) Automatic temperature control systems and equipment
- d) Air distribution systems and equipment
- e) Outdoor ventilation systems and equipment
- f) Kitchen and associated dining room equipment, if applicable
- g) Exhaust systems and equipment
- h) Hot water systems
- i) Electric motors 5 HP and above, transmission and drive systems
- j) Interior and exterior lighting
- k) Laundry equipment, if applicable
- l) Water consumption end uses, such as restroom fixtures, water fountains, irrigation, etc.
- m) Other major energy using systems, if applicable

The CONTRACTOR must address the following considerations:

- a) The loads, proper sizing, efficiencies or hours of operation for each system; (Where measurement costs, facility operating or climatic conditions necessitate, engineering estimates may be used, but for large fluctuating loads with high potential savings, appropriate measurements are required unless waived by the Client).
- b) Current operating condition for each system;
- c) Remaining useful life of each system;
- d) Feasible replacement systems
- e) Hazardous materials and other environmental concerns

Use data loggers and conduct interviews with facility operation and maintenance staff regarding systems operation, occupancy patterns and problems with comfort levels or equipment reliability.

3. Baseline Establishment

Establish a base year consumption and reconcile with end use consumption estimates.

- a) Establish base year consumption by examining utility bills for the past 36 months for electricity, gas, steam, water, etc. Present base year consumption in terms of energy units (kWh, kW, ccf, Therms, gallons, or other units used in bills), in terms of dollars, and in terms of dollars per square foot. Describe the process used to determine the base year (averaging, selecting most representative contiguous 12 months, etc.).
- b) Consult with Facility personnel to account for any anomalous schedule or operating conditions on billings that could skew the base year representation. CONTRACTOR will account for periods of time when equipment was broken or malfunctioning in calculating the base year.
- c) Estimate loading, usage and/or hours of operation for all major end uses of total Facility consumption including, but not limited to: lighting, heating, cooling, motors (fans and pumps), plug loads, and other major energy and water using equipment. Where loading or usage are highly uncertain (including variable loads such as cooling, CONTRACTOR will use its best judgment, spot measurements or short-term monitoring. CONTRACTOR should not assume that equipment run hours equal to the operating hours of the building(s) or Facility staff estimates.
- d) Reconcile annual end-use estimated consumption with the annual base year consumption. This reconciliation will place reasonable “real-world” limits on potential savings.
- e) Propose adjustments to the baseline for energy and water saving measures that will be implemented in the future.

4. Preliminary Analysis of Measures (ASHRAE Level 2).

a) Identify Potential Measures

Interview the facility manager, maintenance staff, subcontractors and occupants of each building within the Facility regarding:

- i. Facility operation, including energy management procedures
- ii. Equipment maintenance problems
- iii. Comfort problems and requirements
- iv. Equipment reliability
- v. Projected equipment needs
- vi. Occupancy and use schedules for the facility and specific equipment.
- vii. Facility improvements – past, planned, and desired

b) Survey

Survey major energy-using equipment, including:

- i. Lighting (indoor and outdoor)
- ii. Heating and heat distribution systems
- iii. Cooling systems and related equipment
- iv. Automatic temperature control systems and equipment
- v. Air distribution systems and equipment
- vi. Outdoor ventilation systems and equipment
- vii. Exhaust systems and equipment
- viii. Hot water systems
- ix. Electric motors
- x. Transmission and drive systems
- xi. Special systems (kitchen/dining equipment, etc.)
- xii. Renewable energy systems
- xiii. Other energy using systems
- xiv. Water consuming systems (restroom fixtures, water fountains, irrigation systems, etc.)

c) Additional Surveys

Perform "late-night" surveys outside of normal business hours or on weekends to confirm building system and occupancy schedules, if deemed necessary.

d) Assess Potential Measures

Develop a preliminary list of potential energy and water saving measures. Consider the following for each system:

- i. Comfort and maintenance problems
- ii. Energy use, loads, proper sizing, efficiencies, and hours of operation
- iii. Current operating condition
- iv. Remaining useful life
- v. Feasibility of system replacement
- vi. Hazardous materials and other environmental concerns
- vii. Owner's future plans for equipment replacement or building renovations
- viii. Facility operation and maintenance procedures that could be affected
- ix. Capability to monitor energy performance and verify savings

CONTRACTOR agrees to work diligently to assess validity of information provided and to confirm or correct the information as needed.

e) List Measures

Develop a preliminary analysis of potential energy and water saving measures. This list shall be compiled and submitted to DASNY within 45 calendar days of the execution of the EA Agreement.

- i. List all potential opportunities, whether cost-effective or not. Consider technologies in a comprehensive approach including, but not limited to lighting systems, heating/ventilating/air conditioning equipment and distribution systems, controls systems, building envelope, motors, kitchen equipment, pools, renewable energy systems, other special equipment, irrigation systems, and water saving devices.
- ii. Identify measures which appear likely to be cost effective and therefore warrant detailed analysis

f) Evaluate Measures

- i. Estimate the cost, savings and life expectancy of each proposed measure.
- ii. Conduct a preliminary analysis of potential measures using life cycle cost analysis and examining the value of non-energy benefits of specific measures

g) Assess Deep Retrofit Opportunities

- i. Survey performance and quality of passive energy elements such as envelope performance (window, wall, roof, floor, slab), points of infiltration, daylighting/blinds.

5. Meeting(s) with DASNY and the Client to Present Findings

- a) Meet with DASNY to present preliminary findings prior to thorough analysis at each of the iterations the Agreement.
- b) Describe how the projected project economics meet the DASNY's terms for completing the EA and EPC Proposal. Discuss assessment of energy use, savings potential, project opportunities, and potential for developing an Energy Performance Contract.
- c) Develop a list of recommended measures for further analysis. DASNY shall have the option to reject calculations of savings, potential savings allowed, or Project recommendations.

The result of this meeting is that CONTRACTOR and Client are to come to agreement on the Assessment Workplan (**Attachment A: Sample Assessment Workplan Approval Matrix**) for the measures that merit further analysis.

6. Savings Analysis

- a) Follow the methodology of ASHRAE or Department of Energy following the engineering principle(s) identified for each retrofit option
- b) Utilize assumptions, projections and baselines which best represent the true value of future energy or operational savings. Include accurate marginal costs for each unit of savings at the time the audit is performed, documentation of material and labor cost savings, adjustments to the baseline to reflect current conditions at the facility, calculations which account for the interactive effects of the recommended measures.
- c) Use best judgment regarding the employment of instrumentation and recording durations to achieve an accurate and faithful characterization of energy use
- d) Provide analysis methodology, supporting calculations and assumptions used to estimate savings.
- e) Manual calculations should disclose essential data, assumptions, formulas, etc. so that a reviewer could replicate the calculations based on the data provided
- f) For savings estimates using computer simulations, the CONTRACTOR shall provide access to the program and all inputs and assumptions used, if requested by the Owner.
- g) Provide detailed calculations for any rate savings proposals
- h) Provide detailed supporting calculations for any proposed maintenance savings
- i) Estimate any environmental costs or benefits of the proposed ECMs (e.g., disposal costs, avoided emissions, water conservation, etc.)
- j) Specify Facility operations and maintenance procedures which will be affected by the installation/implementation of the proposed ECMs.

7. Cost Estimates

- a) Provide detailed estimates of costs associated with the installation, implementation, and commissioning of each of the ECMs proposed in the EA including breakouts for labor, materials, and equipment.
- b) In addition, project cost data must be provided per Owner's direction.
- c) Provide estimates of monthly costs associated with sustaining the project performance including breakouts for maintenance fees, monitoring fees, and training fees.

8. Measurement and Verification

For a detailed description of Measurement and Verification requirements of CONTRACTOR, refer to Department of Energy ESPC Appendix and Schedules.

- a) Provide a preliminary savings measurement and verification plan for each proposed ECM.
- b) Develop a measurement and verification plan for each measure, prioritizing IPMVP options C (or D) for whole building analysis.
- c) Follow additional guidelines for analysis and report preparation given below.

9. Commissioning

For a detailed description of commissioning requirements of CONTRACTOR, refer to Department of Energy ESPC Appendix and Schedules.

- a) Provide a preliminary commissioning plan for the proposed ECM.

10. Reports

The Draft EA Report must provide an engineering and economic basis for negotiating potential Design and Implementation Phases Energy Performance Contract Work Authorizations between the DASNY and the CONTRACTOR. The report shall include:

- a) Overview
 - i. Contact information
 - ii. Executive Summary
 - iii. Description of the facility, measures evaluated, analysis methodology, results
 - iv. Summary table presenting the cost and savings estimates for each measure and for the project as a whole.
 - v. Summary table of recommended energy and water saving measures, including total and itemization for each measure of total design and construction cost, annual maintenance costs, the first-year cost avoidance (in dollars and energy units), simple payback and equipment service life
 - vi. Any cost savings due to changes to utility rates or commodity costs due to changes in metering, commodity procurement, etc.
 - vii. Summary of annual energy and water use and costs by fuel type and costs of existing or base year condition
 - viii. Calculation of energy and cost savings expected if all recommended measures are implemented, and total percentage savings of total facility energy cost.
 - ix. Description of the existing facility, mechanical and electrical systems
 - x. Summary description of measures, including estimated costs and savings for each as detailed above
 - xi. Available rebates and incentives
 - xii. Summary of recommended Client related actions (i.e., internal occupant energy reduction programs or competitions, plug load reduction measures, procurement recommendations- laptops not desktops, etc.)
 - xiii. Discussion of measures considered but not recommended, with detail.
 - xiv. Summary of the value beyond energy cost savings (i.e., employee retention and recruiting benefits, employee productivity benefits, etc.). Qualitative at a minimum, quantitative would be best.

- xv. Conclusions and recommendations
- b) Baseline and/or base year energy use
 - i. Description and itemization of current billing rates, including schedules and riders.
 - ii. Summary of all utility bills for all fuel types and water
 - iii. Identification and definition of base year consumption and description of how established
 - iv. Provide detail on baseline adjustments, if any, as approved by the Owner.
 - v. Reconciliation of estimated end use consumption (i.e. lighting, cooling, heating, fans, plug loads, etc.) with base year (include discussion of any unusual findings)
- c) Description of each operational, energy and water savings measure including:
 - Written description
 - i. Existing conditions
 - ii. Description of equipment to be installed and how it will function
 - iii. Detailed descriptions for each measure including analysis method, supporting calculations (submitted in appendices), results, proposed equipment and implementation issues, including a discussion of facility operations and maintenance procedures that will be affected by installation/implementation.
 - iv. Plan for installing or implementing the recommendation.
 - v. Discussion of the conclusions, observations and caveats regarding cost and savings calculations.
- d) Savings calculations
 - i. Base year energy use and cost
 - ii. Post-retrofit energy use and cost
 - iii. Savings calculations including analysis methodology, supporting calculations and assumptions used.
 - iv. Annual savings calculations, unless directed otherwise by Owner. The cost savings for energy saving measures estimated per year.
 - v. Savings calculations must be limited to savings allowed by the Owner as described above.
 - vi. Percent cost-avoidance projected
 - vii. Description and calculations for any proposed rate changes
 - viii. Explanation of how savings interactions between retrofit options is accounted for in calculations.
 - ix. Operation and maintenance savings, including detailed calculations and description. Ensure that maintenance savings are only applied in the applicable years and only during the lifetime of the particular equipment.
 - x. If computer simulation is used, include a short description and state key input data and software used. If requested by Owner, access will be provided to the program and all assumptions and inputs used, and/or printouts shall be provided of all input files and important output files and included in the EA with documentation that explains how the final savings figures are derived from the simulation program output printouts
 - xi. If manual calculations are employed, formulas, assumptions and key data shall be stated.
 - xii. Conclusions, observations, caveats
- e) Cost estimate
 - i. A detailed narrative of the construction work needed, suitable for cost estimating. Level of detail to be provided should be consistent with Energy Assessment Workplan. Include all anticipated costs associated with installation and implementation. Provide specifications for major mechanical components as well as detailed lighting and water fixture counts.
 - ii. Engineering/design costs
 - iii. CONTRACTOR/vendor estimates for labor, materials, and equipment; include special provisions, overtime, etc., as needed to accomplish the work with minimum disruption to the operations of the facilities.
 - iv. Permit costs

- v. Construction management fees
- vi. Environmental costs or benefits (disposal, avoided emissions, handling of hazardous materials, etc.)
- vii. Note that all markups and fees stated in this Contract shall be used in the cost estimates, unless otherwise documented and justified due to change in scope or size of project or other unforeseen circumstances.
- viii. Conclusions, observations, caveats
- ix. Estimate of average useful service life of equipment
- x. Preliminary commissioning plan (as outlined in Energy Savings Performance Contract – Schedules)
- xi. Preliminary measurement and verification plan, following the current version of the International Performance Measurement and Verification Protocol (IPMVP), explaining how savings from each measure is to be measured and verified (description of Option A, B, C, or D will be implemented for the measure). The Preliminary M&V plan shall be per Owner direction and should be consistent with the methodology agreed to in the Energy Assessment Workplan (Attachment A: Sample Assessment Workplan Approval Matrix).
- xii. Discussion of impacts that facility would incur after implementation of the ECMs. Consider operation and maintenance impacts, staffing impacts, budget impacts, etc., and identify who is responsible for maintenance.
- xiii. Compatibility with existing systems. NOTE: Include the name of the existing controls system if new controls systems will have to be compatible with an existing brand of controls. Also note if a sole-source vendor is established for controls systems.
- xiv. Complete appendices that document the data used to prepare the analyses. Describe how data were collected.

11. Review and Finalization of EA

DASNY and the Client will review the EA Report, and the Parties will meet and discuss the following items:

- a) The modifications required to finalize the EA Report, including how the forecasted Project economics meet DASNY 's terms for completing the Project.
- b) Determine if additional capital contributions to the Project are necessary to improve the economics of the overall project.

The CONTRACTOR will finalize the EA Report consistent with DASNY and the Client's comments and requirements.

12. Energy Performance Contractor's Design Services and/or Implementation Contract Proposal

Prepare an Energy Performance Design Services and/or Implementation Proposal. Attach required Schedules and Exhibits as attachments to the Energy Performance Design Services and/or Implementation Proposal. In anticipation of the CONTRACTOR and DASNY entering into an agreement to design, install, and provide the M&V for the ECMs and water saving measures proposed in the EA Reports, the CONTRACTOR shall prepare a Proposal for terms to be incorporated, which shall include, but are not limited to:

- a) Specific recommended measures from the preliminary compilation for installation and implementation at the Facility.
- b) Project Estimated Cost - the total forecast estimated cost amount Owner will pay for the installation project and CONTRACTOR's services, which must be consistent with forecast cost estimates. Costs may include but are not limited to: engineering, designing, packaging, procuring, installing (from EA Report results); performance/payment bond costs; construction management fees; maintenance fees; monitoring fees; training fees; overhead and profit; and other markups approved by the Owner.
- c) Include a List of Services that will be provided as related to each cost.
- d) Schedule covering the design and implementation phases of the Project.

- e) Measurement and verification methods must be consistent with the latest version of the *International Performance Monitoring and Verification Protocol*. Measurement and Verification shall be conducted on each measure unless otherwise specified.
- f) Explanation of how the savings will be calculated and adjusted. Adjustments made to the energy baseline shall only be made for any of the following changes in conditions affecting the facility:
 - i. utility rates
 - ii. number of days in the utility billing cycle
 - iii. floor area of the facility
 - iv. operational schedule of the facility
 - v. facility temperature
 - vi. weather, if change is significant
 - vii. amount of equipment or lighting used in the facility, if change is significant
 - viii. space type(s) in the facility if change is significant; and
 - ix. material change(s) in or to the facility.

13. Review

Meet with Owner to:

- a) Review the recommendations, savings calculations and impact of the measures on the operations of the facility. Describe how the projected project economics meet the Owner's terms for completing the Project.
- b) Revise EA as agreed by Owner

E. Appendix

1. ATTACHMENT A. Sample Assessment Workplan Approval Matrix

The table below summarizes the approach for the CONTRACTOR to develop the scope of work, guaranteed savings, and measurement and verification of the energy savings during the energy assessment (EA). Changes and modifications to may occur throughout the EA, however must be approved by all parties.

	ECM Description	Scope of Work Development	Savings Analysis	M&V Approach
1	Lighting Retrofit	Room-by-Room audit with planned retrofits	Pre and post wattage and hours of operation in the Room-by-Room audit	Retrofit isolation. Pre- and post- wattage measurements of a statistically valid sample of retrofits
2	Building Automation System	DDC points list with sequences of operation	BIN analysis utilizing local weather data and system design parameters.	Baseline operating conditions documented on xx/yy/2014 and approved by owner’s facilities staff. The BAS trending capabilities will be used on a short-term basis to verify BAS operating as per CONTRACTOR design. Semi-annual visits from CONTRACTORs Cx engineers to verify system to continues to operate within design parameters.
3	New Chiller Plant	General arrangement and single-line process drawings. Equipment submittal package.	BIN analysis utilizing local weather data and system design parameters.	Use existing BAS to trend baseline CHW plant operating parameters for 60 days during EA to determine Kw/ton at varying loads. Use BAS to trend CHW plant operating parameters to calculate post-retrofit kw/ton. Use verified data in baseline and post-retrofit BIN analysis.
4	Convert from Constant Volume to Variable Air Volume	Identify locations of boxes to be converted on the existing building HVAC plans. Equipment submittal packages for each type/size of box to be installed. DDC schematic for a sample VAV box with sequence of operations.	eQuest model to be calibrated to current baseline within x %.	eQuest model for the impacted building
5	Window Replacement	Room-by-Room audit with planned retrofits	eQuest model to be calibrated to current baseline within x %.	eQuest model for the impacted building
6	Wall/roof replacement or insulation enhancement	Room-by-Room audit with planned retrofits	eQuest model to be calibrated to current baseline within x %.	eQuest model for the impacted building
7.	Infiltration sealing	Blower door test or smoke test on each aperture. Visual inspection?	eQuest model to be calibrated to current baseline within x %.	eQuest model for the impacted building

	ECM Description	Scope of Work Development	Savings Analysis	M&V Approach
8.	New Boilers, burners, or boiler controls	Inspection of condition, evaluation of viability, combustion efficiency testing	Post retrofit combustion efficiency estimates	Post retrofit combustion efficiency tests and/or data collected from dedicated boiler controls

2. Abbreviations

The following is a list of terms and associated definition:

Abbreviation	Definition
ASHRAE	American Society of Heating, Refrigeration and Air-Conditioning Engineers
CCF	Hundred Cubic Feet
DASNY	Dormitory Authority of the State of New York
DOE	Department of Energy
ECI	Energy Cost Index
ECM	Energy Conservation Measure
EEM	Energy Efficiency Measures
EPA	United States Environmental Protection Agency
EPC	Energy Performance Contract
CONTRACTOR	Energy Service Company
ESP	Energy Services Provider
EUI	Energy Utilization Index
HP	Horsepower
EA	Energy assessment
IPMVP	International Performance Measurement & Verification Protocol
kW	Kilowatts
kWh	Kilowatts per hour
LEED	Leadership in Energy and Environmental Design
M&V	Measure and Verification
O&M	Operation and Maintenance
PEA	Preliminary Energy-Use Analysis