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SYARAT-SYARAT KONTRAK & SPESIFIKASI
UNTUK
KONTRAK PRESTASI TENAGA
(ENERGY PERFORMANCE CONTRACT - EPC)

*CAWANGAN KEJURUTERAAN MEKANIKA
IBU PEJABAT JKR MALAYSIA*

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FORM OF ENERGY PERFORMANCE CONTRACT

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ENERGY PERFORMANCE CONTRACT

THIS CONTRACT is made on the _____ day of _____ 20 ____.

BETWEEN

The Government of Malaysia (hereinafter referred to as the "Government") of the one part;

AND

_____ (Company No: _____)
(hereinafter called the "ESCO") a corporation having its principal offices at _____ of the other part,

WHEREAS:

- A. The Government is desirous to implement the energy conservations measures through an energy services company at its Facility.
- B. ESCO is an energy services company that provides certain services and equipment to reduce energy consumption in buildings.
- C. ESCO has submitted a written proposal to the Government's request and the Government has agreed to appoint subject to the terms and conditions of this Contract.

NOW IT IS HEREBY AGREED AS FOLLOWS:

1. DEFINITIONS AND INTERPRETATION

1.1 Definition

Contract	means this Contract together with its Appendices as varied or amended from time to time.
Completion Date	means the date on which the ESCO warrants by written notice that the ESM are completed and are producing savings equal to or greater than the Guaranteed Savings.
Contract Period	means the period referred to in clause 5.
Energy Baseline	means the energy baseline is a calculation or measure of each type of energy consumed in existing facilities, prior to the installation of energy efficiency measures as set out in the _____. For purposes of this Contract, electrical demand, measured in kilowatts (kW) will be considered a type of energy.
Energy Manager	means manager appointed by ESCO as the representative of ESCO who is a Professional Engineer or Architect, who is

experienced in energy savings and consistently present on the Facility from the Commencement Date.

Energy Saving Measure (ESM) means an ESM is the installation of new equipment, modification or alteration of existing Government equipment, or revised operations and maintenance procedures to reduce energy costs by improving efficiency of use.

Energy Savings means a reduction of energy consumption or electrical demand resulting from the ESCO's energy efficiency measures. Energy savings shall be determined by comparing the energy baseline with the energy consumed (or demand) after ESCO has implemented energy efficiency measures.

Energy Audit Report means part of the written proposal submitted by ESCO during tender stage as annexed in Appendix ____.

Facility means the Government building located at _____.

Services means the work and services required by the Contract during the installation and during any period of time during which the ESCO is required to remedy or replace its work and services pursuant to this Contract, whether completed or partially completed and includes all labour, materials, ESM and services provided or to be provided by the ESCO to fulfill the ESCO's obligations under this Contract.

1.2 Interpretation

- (a) Unless otherwise specifically stated, any reference to Clauses and Appendices in the Contract and the Appendices to any clause means that clause of this Contract.
- (b) This Contract and the Appendices are to be read as a whole and the effect or operation of any clause in this Contract or item in or entry in the Appendices shall, unless otherwise specifically stated, be read subject to any relevant qualification or modification in any other clauses in this Contract or item or entry in the Appendices.
- (c) The terms "concurrence" and "approval" wherever used in this Contract means written consent or approval by the Government or the Government Representative as the case may be, pursuant to a written request or submission made by the ESCO.
- (d) The "instructed" wherever used in this Contract means a written consent or approval by the Government or the Government Representative.
- (e) Words importing the singular shall also include the plural and vice versa.
- (d) The headings are for convenience of reference only and shall not be deemed to be part of this Contract or to be taken into consideration in the interpretation or construction of this Contract.

2. SCOPE OF CONTRACT

ESCO shall subject to the terms and conditions of this Contract:

- (a) undertake the design and construction of ESM;
- (b) supply , install and complete the construction of ESM;
- (d) undertake the provisional test and final test of the ESM;
- (e) operate, manage and maintain at its own costs and expense the ESM throughout the Contract Period to achieve the reduction of the energy costs as stipulated in the Contract;
- (f) upon expiry of the Contract, all installed ESM shall belong to the Government.

3. CONSIDERATION

3.1 As a consideration of the Services carried out by the ESCO, upon -

- (a) ESCO submitting the monthly report;
 - (b) the Government make inspection and evaluation of the Services in the reports;
 - (c) the Government is in the opinion that ESCO has achieved the agreed savings guaranteed; and
 - (d) with the acceptance of Notice of Installation,
- the Government shall issue certificate of payment pertaining to the agreed ratio of savings sharing in accordance with the agreed formulae in Appendix _____ within 14 days from inspection and evaluation of the Services by the Government.

Within a number of days as stated in Appendix (or if none stated then within thirty (30) days of the issue of any such Interim Certificate), the Government shall make a payment to the ESCO.

3.2 The ESCO shall guarantee the agreed savings percentage to be calculated as in the agreed formulae as annexed in Appendix _____.

3.3 If the ESCO fails to achieve the agreed savings guaranteed specified in the Energy Audit Report and Appendix _____, the difference between the decreased agreed savings guaranteed and the current savings achieved in that particular month, shall be borne by the ESCO.

4. EFFECTIVE DATE

This Contract shall be deemed to have effect on the date when the Government grants access to the Facility ("Commencement Date").

5. CONTRACT PERIOD

- 5.1 This Contract shall be for a period of 5 years commencing from the Commencement Date ending on _____.
- 5.2 The ESCO shall supply and complete the installation of the ESM on or before _____ pursuant to Clause 17 of this condition of contract.
- 5.3 _____ (__) months prior to the date of expiry of the Contract Period pursuant to Clause 5.1, the ESCO may apply to the Government for an extension of the Concession for a further period. The Parties hereto shall, as soon as reasonably practicable after the receipt by the Government of such application, negotiate the terms and conditions of such extension on fully commercial terms with no special privileges and no preferential rights, to the intent that such terms and conditions are to be agreed by both parties hereto not later than _____ (__) months prior to the date on which the Contract Period would have otherwise expired pursuant to Clause 5.1. In the event the parties hereto are unable to reach an agreement, then the Contract shall automatically expire on the _____.

6. REPRESENTATIONS, WARRANTIES AND UNDERTAKINGS OF ESCO

6.1 Representations and Warranties

ESCO represents and warrants to the Government throughout the Contract Period –

- (a) the ESCO is a corporation validly existing under the laws of Malaysia;
- (b) the ESCO has obtained a valid registration with the Ministry of Finance;
- (c) the ESCO has the corporate power to enter into and perform his obligations under this Contract and to carry out the transactions and to carry on his business as contemplated by this Contract;
- (d) the ESCO has taken all necessary corporate actions to authorize the entry into and performance of this Contract and to carry out the transaction contemplated by this Contract;
- (e) neither the execution nor performance by it of this Contract nor any transactions contemplated by this Contract will violate in any respect any provision of –
 - i) its Memorandum and Articles of Association; or
 - ii) any other document or agreement which is binding upon it or its asset;
- (f) ESCO has all requisite power, authority, licenses, permits, and franchises, corporate or otherwise, necessary to execute and deliver this Contract and to perform its obligations;
- (g) ESCO execution, delivery, and performance of this Contract will not result in a breach or violation of or constitute a default under any agreement, lease, or

instrument to which it is a party or by which it or its properties may be bound to be affected; and

- (h) no litigation, arbitration, tax claim, dispute or administrative proceeding is presently current or pending or, to its knowledge, threatened, which is likely to have a material adverse effect upon its ability to perform its financial or other obligations under this Contract;
- (i) this Contract constitutes a legal, valid and binding obligation of the ESCO and is enforceable in accordance with its terms and conditions; and
- (j) it has necessary financial and technical capability, skills and expertise to undertake the Services,

and the ESCO acknowledges that the Government has entered into this Contract in reliance on its representations and warranties as aforesaid.

6.2 Undertakings of ESCO

The ESCO undertakes that –

- (a) it shall comply with all requirements, statutory or otherwise, regulating or relating to the conduct, trade, business or profession of an ESCO and the ESCO shall be fully and solely liable for all costs incurred thereby;
- (b) it shall pay all taxes that may be imposed on the profits made in respect of this Contract in accordance with the applicable laws; and
- (c) it shall ensure that all his employees, including non-Malaysian personnel, comply with all relevant laws to which they are subject to, including payment of income tax, which in respect thereto the ESCO shall make such deductions from the salaries of his employees as may be lawfully imposed by the relevant authority.
- (d) All materials, goods and workmanship shall be of the respective kinds and standards described in the Specification and of good quality and in accordance with the standard of the workmanship in the industry. The ESCO shall upon the request of the Government Representative, furnish him with the relevant certificates and/or vouchers to prove that the materials and goods comply with the Specification.

7. COMPLIANCE WITH THE LAW IN PERFORMING THE WORKS

- 7.1 The ESCO shall comply with all respects (including the giving of all notices and the paying of all fees required) with any law, regulation or by-law, or any order or directive issued by any public authority or public service company (hereinafter referred to as “Statutory Requirements”), relating to the Services or, in the case of a public authority or public service company, with whose systems the same are or will be connected. The ESCO shall keep the Government indemnified against all penalties and liability of every kind of breach of any such Statutory Requirements. The ESCO shall submit to the

Government Representative all documentation received by the ESCO in complying with the Statutory Requirement.

- 7.2 If the ESCO or the Government finds any divergence between the Statutory Requirements and either the Government's Requirements, or the Energy Audit Report, he shall immediately give to the other written notice specifying the divergence. In either case, the ESCO shall inform the Government in writing of his proposed amendment for removing the divergence, and with the Government's consent (which shall not be unreasonably delayed or withheld) the ESCO shall entirely at his own cost complete the Services in accordance with the amendment and the Government shall note the amendment on the Contract Documents.
- 7.3 If in any emergency, compliance with clause 7.1 requires the ESCO to execute the Services before receiving the Government's consent under clause 7.2, the ESCO shall execute such Services as are reasonably necessary to secure immediate compliance with the Statutory Requirements. The ESCO shall forthwith inform the Government of the emergency and of the steps that he is taking under this clause.
- 7.4 The ESCO shall pay and indemnify the Government against liability in respect of any fees, levy, charges, rates or taxes (including capital contribution) legally demandable under any written law, regulation or by-law of any local authority or of any statutory undertaker in respect of the Services.

8. RIGHTS OF GOVERNMENT REPRESENTATIVE

- 8.1 The Government shall notify in writing the person named as the Government Representative to carry out its obligations and to exercise its right under this Contract, and the Government Representative shall have the powers to carry out such obligations and exercise such rights on behalf of the Government.
- 8.2 The ESCO shall comply with all instructions issued by the Government Representative with regard to matter expressly empowered to the Government Representative to issue under this Contract.
- 8.3 All instructions, notifications, consent or approval issued by Government Representative shall be in writing. However, the Government Representative may where necessary issue oral instructions, consents and approval and such shall be followed in writing not later than 14 days thereafter.
- 8.4 If the ESCO requires a decision from the Government for the performance of its Services under this Contract, the ESCO shall submit its request in writing to the Government Representative and the Government Representative shall give its decision within 14 days from the date of acceptance.

9. OBLIGATIONS OF THE ESCO

9.1 The ESCO shall –

- (a) at any time retain at the Facility a competent, efficient, suitably qualified and experience Energy Manager who must be of good character and capable of receiving instructions and communicating in Bahasa Malaysia and English. Any instruction given to such Energy Manager by the Government and/or Government Representative shall be deemed to have been given to the ESCO.
- (b) maintain facility performance requirements throughout the Contract Period, as follows:
 - (i) In conditioned areas, space temperatures shall be maintained as per comfort level as specified in Technical Specifications.
 - (ii) CO₂ level cannot exceed limit specified in the Technical Specifications.
 - (iii) Minimum lighting levels shall be maintained as specified in Technical Specifications.

9.2 The Energy Baseline may change if the facility undergoes significant changes except due to non-performance of ESM. Any significant change in facility that may reasonably be expected to change the energy consumption of the facility by more than ten percent (10%) shall be considered as a significant change.

9.3 ESCO or the Government shall notify of any change in the facility's equipment or operating conditions that can reasonably be expected to constitute a significant change within thirty (30) days of the time that the change becomes known to either party. If the notice is not timely made, the modifications allowed in Clause 9.4 below shall be effective at the time the change commenced. PROVIDED THAT the Government shall approve the new baseline and the approved baseline shall be used as new basis for the payment.

9.4 In the event of a significant change, the Energy Baseline shall be determined by Government after proposal for change is made by ESCO.

9.5 The ESCO shall employ in and about the execution of the Services, only such persons as are of good character, careful, skilled and experienced in their respective vocations and trades to complete this Contract.

9.6 The ESCO shall maintain on the Facility at all times during the progress of the Services an up-to-date register containing particulars of all workers employed by him.

9.7 The Government Representative shall be at liberty to object to and require the ESCO to remove immediately from the Facility any person employed by the ESCO in or about the execution of the Services who in the opinion of the Government Representative misconducts himself or is incompetent or negligent in the proper performance of his duties and whose continued presence is undesirable or unacceptable. Such person shall not again be employed upon the Services without the prior written permission of the Government Representative.

9.8 Any person so removed from the Services shall be replaced without delay by a substitute approved by the Government Representative; PROVIDED THAT

the ESCO shall not be entitled to any claim for any expense whatsoever incurred by him in respect of any direction given by the Government Representative under this clause.

- 9.9 The ESCO shall perform all work including maintenance works with extreme care to avoid damage to existing construction and installations.
- 9.10 The ESCO shall make all necessary provisions to keep interferences to a minimum as to the scheduling of work and storage of materials and shall confine its operations, materials, and equipment within the immediate vicinity of the new work.
- 9.11 ESCO shall prearrange or schedule with the Government for all disruptive noise-producing construction activities so as not to unreasonably obstruct or interfere with any activities of the Government. The work shall be coordinated and planned in a manner that will permit operation of Government facilities without interruptions.

10. CONDITION PRECEDENT

This Contract is conditional upon the fulfillment of the following conditions precedent:

- 10.1 the ESCO shall procure to the Government a Performance Bond substantially in the form of Appendix _____ for **five** per centum (**5%**) of the projected agreed savings guaranteed;
- 10.2 the ESCO shall, prior to the commencement of the Services, effect and maintain or cause to be effected and maintained insurance as referred to under Clause 20 for the Services throughout the Contract Period.

11. PERFORMANCE BOND

- 11.1 The ESCO shall as a condition precedent to the commencement of any works under this Contract procure to the Government a Performance Bond substantially in the form of Appendix _____ issued by an approved licensed bank or financial institution incorporated in Malaysia in favor of the Government for a sum equivalent to **five** per centum (**5%**) of the projected agreed saving guaranteed to secure the due performance of the ESCO's obligations under this Contract. The Performance Bond shall remain valid and effective from the date of issuance until twelve (12) months after the expiry of the Contract Period.
- 11.2 If the ESCO fails to procure the said Performance Bond in the form as specified under clause 11.1 by the Commencement Date, it shall be deemed as a material breach under this Contract.
- 11.3 Notwithstanding anything contained in this Contract, if the ESCO fails to perform any his obligations under the Contract and such failure is not remedied in accordance with this Contract, the Government shall be entitled to call upon the Performance Bond, wholly or partially.

- 11.4 If a payment is made to the Government pursuant to any claim under the Performance Bond, the ESCO shall issue to the Government further security in the form of additional Performance Bond.
- 11.5 The Performance Bond (or any balance thereof remaining for the credit of the ESCO) may be released or refunded to the ESCO at the end of the Contract Period plus 12 months thereafter.
- 11.6 Notwithstanding any of the clauses above, in the event this Contract is terminated, the said Performance Bond or any balance thereof shall be forfeited.

12. INSURANCE OF WORKS

- 12.1 The ESCO shall, in the joint names of the Government and the ESCO, insure against loss and damage by fire, lightning, explosion, storm, tempest, flood, ground subsidence, bursting or overflowing of water tanks, apparatus or pipes, aircraft and other aerial devices or articles dropped therefrom, riot and civil commotion, all works executed and all unfixed materials and goods delivered to, placed on or adjacent to the Works and intended thereof (but excluding temporary buildings, plant, tools and equipment owned or hired by the ESCO) to the full value thereof together with the cost of the design work of the ESCO (plus any amount which may be specifically stated in Appendix ____) and shall keep such works, materials and good so insured until the completion of the whole Works. Such insurance policy or policies shall provide expressly for payment in the first place to the Government of any insurance monies due under the policy or policies.
- 12.2 The said insurance with or without an excess clause as specified in Appendix ____ shall be effected with an insurance company approved by the Government Representative and the ESCO shall deposit with the Government Representative the policy or policies and the receipts for the premium paid for such insurance. Where an excess clause is specified in Appendix _____, the ESCO shall bear the amount of such excess.
- 12.3 In the event the ESCO fails to renew such insurance as are necessary under this clause, the Government or the Government Representative on its behalf may renew such insurance and pay the premium in respect thereof and deduct the amount so expended including the On-cost Charges from any money due or to become due to the ESCO under this Contract, and failing which such premium shall be recovered from the Performance Bond or as a debt due from the ESCO.
- 12.4 Upon the occurrence of any loss or damage to the Services or unfixed materials or goods prior to the completion of the Services from any cause whatsoever, the ESCO shall notwithstanding that settlement of any insurance claim has not been completed, with due diligence restore, replace or repair the same, remove and dispose of any debris and proceed with the carrying out and completion of the Services. All money if and when received from the insurance under this clause shall be paid in the first place to the Government and then (less only such amounts as are specifically required in Appendix ____

or elsewhere in the Contract) be released to the ESCO by installments on the certificate of payment issued by the Government Representative.

- 12.5 The ESCO shall ensure that any insurance policy effected hereto shall only be cancelled by the insurer after the expiry of thirty (30) days from the date of receipt by the Government of a written notice from the insurer advising of such impending cancellation.
- 12.6 The ESCO shall not at any time permit or cause to be done any act, matter or thing which may result in any insurance effected by virtue of this Contract being vitiated or rendered void or voidable or whereby the rate of the premium on any insurance effected shall be liable to be increased.

13. PERFORMANCE OF THE WORKS

13.1 Submission of Monthly Report

- (a) The ESCO shall submit reports on the following:

- (i) works properly done at the Facility;
- (ii) progress of the Services;
- (iii) tests done at the Facility;
- (iv) safety measures at the Facility; and
- (v) any other matter as required by the Government,

to the Government Representative each month, or at any time as required by the Government Representative.

- (b) All such report which are to be submitted by the ESCO shall be duly verified and certified by the Energy Manager of the ESCO.
- (c) The submission of such reports under this clause shall be a condition precedent to any payment that the ESCO shall be entitled under clause 3.1 of this Contract. In the event that the ESCO fails to comply with the requirement of this clause, the Government shall withhold any payment that the ESCO would otherwise be entitled to.
- (d) The submission of such reports by the ESCO shall not in any way absolve the ESCO from any of its liability under this Contract.

13.2 ESCO to be Responsible for the ESM

- 13.2.1 The ESCO shall be responsible for quality control during the installation of all ESM. ESCO shall inspect and test all work performed to insure compliance with Contract requirements. ESCO shall maintain records of inspections and tests, including any conducted by or for a utility or other regulatory agencies.

13.2.2 The ESCO shall notify the Government in writing when the ESM are installed and completed by submitting a Notice of Installation and a written request for inspection. The request shall state the total construction cost (including change orders), location, and description of ESM, planned testing of ESM to verify performance, and recommended dates for inspection. Whenever possible, both Government and ESCO representatives will simultaneously inspect ESM to facilitate on satisfactory Contract performance. Upon the Government Representative's satisfaction that the installed ESM have passed the testing and commissioning pursuant to this Contract and subject to Clause 13.2.4, a Certificate of Acceptance shall be issued.

13.2.3 ESCO, at its sole expense, shall be responsible for maintenance and repair of all ESM installed as per Energy Audit Report. Maintenance includes all work and costs associated with periodic inspections, tests, calibrations, and adjustments required to sustain and/or restore energy system operational status to as-designed performance and performance requirements of this Contract. Repair includes all labor, material, and equipment required to replace, rebuild, or restore to as-designed performance systems and equipment that have failed.

13.2.4 ESCO shall furnish operation and maintenance manuals of the ESCO-installed ESM to the Government Representative.

13.2.5 The ESCO shall at all times during the term of the Contract have full ownership responsibilities of the ESCO-furnished systems and equipment. The ESCO may modify, replace, or change the systems and equipment during the Contract from that originally approved if guaranteed savings could not be met, PROVIDED THAT with the approval of the Government, any such modification, replacement, or change of systems or equipment shall be performed by the ESCO at no cost to the Government and shall not interfere with Government operations.

13.2.6 After installation completion and Government acceptance of the installed ESM, the ESCO shall submit as-built drawings and operation and maintenance manuals to the Government's Representative.

13.3 Accident, Failure, etc., to the Services

- (a) If any accident, failure or other event occurs due to any cause whatsoever to, or in connection with the Services or any part thereof during the Contract Period, the ESCO shall immediately report the accident, failure or event to the Government Representative. Unless otherwise directed by the Government Representative generally or in any particular respect conduct a full investigation into the said accident, failure or event in order to determine the cause or reason for the accident, failure or event and submit a report to the Government and the Government Representative together with his proposals for remedial works in respect thereof.

- (b) The ESCO shall not, however cause remedial work to be carried out in respect thereof until directed to do so by the Government Representative in writing. And upon being so directed the ESCO shall proceed with the remedial works within 14 (fourteen) days from the date of such direction.
- (c) Where the Government, its employee or any person or body appointed or authorized by it carried out any investigation in relation to any accident, failure or other event which has occurred to, in or in connection with the Services or any part thereof for the purpose of determining the cause or reason for the said accident, failure or event, the ESCO shall render all such necessary assistance and facilities as may be required by the Government, its employee or such person or body including the giving of access to all specification, designs, records or other available information relating to the Services.
- (d) If by reason of any accident, or failure, or other event occurring to in or in connection with the Services, or any part thereof during the Contract Period, any remedial or other work or repair shall, in the opinion of the Government Representative be urgently necessary for the safety of the Services or the public and the ESCO fails to immediately do such work or repair, the Government may employ and pay other persons to carry out such work or repair as the Government Representative may consider necessary. If the work or repair so done by the Government is work which, in the opinion of the Government Representative, the ESCO was liable to do at his own expense under the Contract, all costs and charges properly incurred by the Government in so doing shall be recoverable from the ESCO by the Government, or may be deducted by the Government from any monies due or which may become due to the ESCO. Provided always that the Government Representative shall, as soon after the occurrence of any such emergency as may be reasonably practicable, notify the ESCO thereof in writing.

14. DESIGN

14.1 Design

- (a) The ESCO shall be fully responsible for the design, execution and maintenance of the Services for which his design have been accepted by the Government. The ESCO further guarantees to the Government that the design, materials and workmanship of the Services complies with the Energy Audit Report as well as are suitable and fit for the purpose and independent of fault.
- (b) Any reference to the design which the ESCO has prepared or shall prepare or issue for the Services shall include the reference to any design which the ESCO has caused or shall cause to be prepared or issued by others.

- (c) Where any part of the Services has been designed by or on behalf of the Government, and that design has been included in the Energy Audit Report, the ESCO shall check the design and accept responsibility for it, having first obtained the approval of the Government Representative for any modifications which the ESCO considers to be necessary.
- (d) The ESM shall take full and unequivocal responsibility for the safety of the design and for the adequacy, stability and safety of the Facility operations and methods of construction.
- (e) Where any Act of Parliament, Regulation or Bye-law requires that a separate check of the design or test shall be carried out prior to the construction of the Services. The ESCO shall arrange and carry out such check or test at his own costs.

14.2 Design Guarantee

- (a) The ESCO shall deposit to the Government a Design Guarantee as per Appendix ____ as a security to the ESCO's obligation under this Contract. The Design Guarantee shall be effective for the duration of six (6) years commencing from the date of completion of the installation of the ESM ("the Design Guarantee Period").
- (b) If any defect, or damage shall occur to the Services of any part thereof as a result of any defect, fault, insufficiency or inadequacy in the design including workmanship, material or equipment arising from the design default during the Design Guarantee Period, the Government shall issue to the ESCO a notice specifying the default and requiring the ESCO to remedy the same within the period specified at the ESCO's own cost and expense. If the same is not remedied, the Government shall be entitled, without prejudice to any other right or remedies, it may possess against the ESCO under this Contract or at law, to claim and recover from the ESCO any payment for any loss and/or damages suffered or any other expenses incurred as a result thereof.
- (c) Notwithstanding the above, the Government may elect to remedy the defect, fault, insufficiency or inadequacy in the design as at the time such defect, fault, insufficiency or inadequacy is established and the Government shall be entitled to deduct the amount up to the limit of sum certified by the Government Representative to be the sum required to remedy the same from any money due or to become due to the ESCO under this Contract, and failing which such sum shall be recovered from the Performance Bond or as a debt due from the ESCO.

14.3 Design Guarantee Bond

- (a) The ESCO shall provide to the Government a banker's guarantee issued by an approved licensed bank/financial institution of the sum of Ringgit (RM) (hereinafter referred to as "the

Design Guarantee Bond”) substantially in the form as in Appendix upon or before the issuance of the Certificate of Practical Completion of the Services. Such Design Guarantee Bond shall remain valid for a period of ____ (__) years from the date of practical completion of the Services.

- (b) If any defect or damage shall occur to the Services or any part thereof as a result of any defect, fault, insufficiency or inadequacy in the designs including workmanship, materials or equipment arising directly from the design fault then the approved licensed bank/financial institution issuing the Design Guarantee Bond pursuant to clause (a) above will indemnify and pay the Government, on demand by the Government in writing and notwithstanding any objection by the ESCO or any other party, the sum ofbeing equal to 5% of the total ESM cost or such part thereof as may be demanded.
- (c) If the Design Guarantee Bond is not deposited with the Government in accordance with Clause (a) above, the Government shall have the right to claim from the Performance Bond the sum of RM being 5% of the total ESM cost.

14A. Intellectual Property

- 14A.1 The Copyright and all other proprietary rights whatsoever in the ESM and other material developed and supplied by ESCO pursuant to or under this Contract shall vest in and shall be the sole property of the Government and ESCO shall not during or at any time after completion of the Works or after the expiry or termination of this Contract, in any way, question or dispute the ownership of the Government. The proprietary rights in the ESM shall vest in the Government free and clear of all liens, claims and encumbrances on the ESM.
- 14A.2 ESCO shall be responsible for any claim that the equipment supplied infringes a patent, copyright or registered design.
- 14A.3 If the Government’s use or possession of the equipment is likely to constitute an infringement, then ESCO shall promptly and at its own expenses procure for the Government the right to continue using and possessing the equipment; or modify or replace the equipment so as to avoid the infringement (in which event the ESCO shall compensate the Government for the amount of any direct loss or damage sustained or incurred by the Government during such modification or replacement).
- 14A.4 ESCO shall indemnify the Government against any claim for the infringement of any letters patent, copyright or registered designs by the use of any equipment or of information supplied under this Contract and against all costs and damages which the Government may incur in any action for which such infringements or for which the Government may become liable in any such action.

15. ESM and Workmanship

15.1 Compliance with Government's Requirement

- (a) ESM and Workmanship shall, so far as procurable, be of the respective kinds and standards described in the Energy Audit Report, PROVIDED THAT the ESCO shall not substitute anything to describe without the Government Representative's consent in writing, which consent shall not be unreasonably delayed or withheld. No such consent shall relieve the ESCO of his other obligations.
- (b) The ESCO shall upon the request of the Government Representative provide him with the relevant certificate or vouchers to prove that the ESM comply with clause 15.

15.2 Inspection and Testing of ESM and Workmanship

- (a) The ESCO shall submit to the Government Representative for his approval proposals for inspecting the design and setting out of the Services and testing the ESM and Workmanship to ensure that the ESM's obligations under the Contract are fulfilled.
- (b) The ESCO shall carry out the inspection and tests approved under clause 15.2 (a) or elsewhere in the Contract and such further tests as the Government Representative may reasonably require, including to open up for inspection any work covered up or to carry out any test of any ESM (whether or not already incorporated in the Services or any executed Services).
- (c) The Government Representative may issue instruction to the ESCO to remove from the Facility or rectify any work, which are not in accordance with this Contract at his own cost.
- (d) The ESCO shall, as may be required by the Government Representative from time to time, provide such assistance, instruments, machines, labour and materials as are normally required for the purpose of examining, measuring and testing of any work, as well as the quality, weight or quantity of the materials used and shall supply samples of materials before incorporating in the Services for testing.
- (e) Unless the Contract otherwise provides, the cost of making any test shall be borne by the ESCO of such test is:
 - (i) proposed by the ESCO; or
 - (ii) clearly intended by or provided for in the Contract.
- (f) Notwithstanding anything in clause 15.2(e), if the ESCO carries out any further test as required by the Government Representative pursuant to clause 15.2(b) and the result of such test shows the workmanship or materials is not in accordance with the provisions of the Contract, then the cost of such test shall be borne by the ESCO. But if the result of

such test shows the workmanship or materials comply with the provisions of the Contract, then the cost of such test shall be borne by the Government.

16. ACCESS TO THE FACILITY

- 16.1 The Government shall provide access to the premises for ESCO during regular business hours, to install, adjust, inspect, maintain, and repair the ESM.
- 16.2 Where any such access is required by the ESCO after regular business hours, the ESCO shall notify and obtain the approval from the Government Representative.

17. INSTALLATION

17.1 ESM Installation Plan

The ESCO shall prepare and submit installation plans and specifications (the "Installation Plans") to the facility for review and approval before starting ESM installation. The Installation Plan shall include manufacturer's descriptive literature including performance and characteristics data and catalog cuts and shop drawings showing in detail the interface between ESMP equipment and existing equipment and the location of ESMP equipment on building floor plans. Installation Plans shall be certified by a Professional Engineer.

17.2 Superintendence

The ESCO shall, at his own cost, provide a competent superintendent, satisfactory to the Government, on the work site at all times during progress of the work with authority to act for the ESCO and shall at all times maintain competent supervision to ensure compliance with Contract. The ESCO shall also provide an adequate staff to assist the superintendent to coordinate and expedite its work properly.

17.3 Inspection

17.3.1 Inspection of Services

The inspection of the ESM and the carrying out of the Services must be jointly done with the Government Representative at the Facility. The ESCO shall direct all inquiries, technical or administrative, to the said representatives during construction and installation of ESM.

17.3.2 Inspection of Material and Workmanship

All materials and workmanship shall be subject to inspection at any and all times during the period of installation. The Government Representative has the right to reject defective material and workmanship. Rejected material shall

be promptly removed from the job site and satisfactorily replaced. Rejected workmanship shall be satisfactorily corrected.

17.3.3 Removal of Debris and Cleanup

The ESCO shall, as directed during the progress of the Services, remove and properly dispose of resultant dirt and debris and keep the Facility reasonably clear. Before the Services shall be considered completed, all equipment and unused materials provided for the Services shall be removed and Facility will be in a neat and clean condition.

17.3.4 Protection of Public

ESCO shall provide adequate, clearly marked and/or lighted barricades or warning signs during the progress of the Services for the protection and safety of the public.

17.3.5 Protection of Property and Buildings

The ESCO shall take all necessary precautions during the progress of the Services to protect the Facility as well as adjoining property, roadways, walkways, trees, lawns, landscape, and buildings from damage and injury and shall promptly repair any such damage to the satisfaction of the Government, at no cost to the Government.

17.3.6 Grounds

During the Contract Period, the ESCO may use areas only within building envelope for installation purpose.

18. INDEMNITIES TO THE GOVERNMENT IN RESPECT OF CLAIMS BY WORKMEN

- 18.1 The ESCO shall be liable for and shall keep indemnified the Government and its officers or servants from all liabilities arising out of claims by any and every workmen employed in and for the performance of this Contract for payment of compensation under or by virtue of the Workmen's Compensation Act 1952 and the Employee's Social Security Act, 1969 or any other law amending or replacing such law and from all costs and expenses incidental and consequential thereto.
- 18.2 The ESCO shall effect and maintain throughout the Contract Period an Employer's Liability insurance or Workmen Compensation Insurance or any other applicable insurance for its personnel, servants, agents or employees required under the laws of Malaysia.

19. GOVERNMENT'S INDEMNITY IN RESPECT OF INJURY TO PERSONS AND DAMAGE TO PROPERTY

- 19.1 The ESCO shall perform all of its obligations under this Contract at its own risk and releases, to the fullest extent permitted by law, the Government and their

agents and servants from all claims and demands of every kind resulting from any accident, damage, injury or death arising from the carrying out of the Services, except where such accident, damage, injury or death is caused or contributed to by any omission or negligence of the Government or its agents and servants. The ESCO shall have no responsibility or liability whatsoever in relation to such accident, damage, injury or death.

19.2 The ESCO shall indemnify and keep indemnified the Government from and against all actions, suits, claims or demands, proceedings, losses, damages, compensation, costs (including legal cost), charges and expenses whatsoever to which the Government shall or may be or become liable in respect of or arising from –

(a) the negligent use, misuse or abuse by the ESCO or its personnel, servants, agents or employees appointed by the ESCO;

(b) any loss or damage to property or injury if whatsoever nature or kind and howsoever or wherever sustained or caused or contributed to by carrying out the Services by the ESCO to any person and not caused by the negligence or willful act, default or omission of the Government, its agents or servants; or

(c) any loss, damage or injury from any cause whatsoever to property or persons affected by the Services to the extent to which the same is occasioned or contributed to by the act, omission, neglect, breach or default of the ESCO or personnel, servants, agents or employees.

19.3 The ESCO agrees that the obligations under this clause shall continue after the expiry or earlier termination of this Contract in respect of any act, deed, matter or thing happening before such expiration or termination of this Contract.

19.4 The ESCO shall indemnify, protect and defend, at its own cost and expense, the Government and its agents and servants from and against all actions, claims and liabilities arising out of acts done by the ESCO in the performance of this Contract.

20. INSURANCE AGAINST INJURY TO PERSONS AND DAMAGE TO PROPERTY

20.1 Without prejudice to his liability to indemnify the Government, the ESCO shall as a condition precedent to the commencement of any work under this Contract, as stated in Clause 10 (b), effect and maintain such insurances whether with or without an excess amount as specified in Appendix ____ as are necessary to cover the liability of the ESCO.

20.2 Such insurance shall be in respect of personal injuries or death, damage or loss to property, movable or immovable, arising out of or in the course of or by reason of the execution of the Services and caused by any negligence, omission, breach of contract or default of the ESCO or any of its servants or agents.

21. SUBCONTRACTING

The ESCO shall not at any time subcontract its obligations or Services to be performed under this Contract, either in whole or in part.

22. ASSIGNMENT

The ESCO shall not assign the Contract or any part thereof, or any benefit or interest therein or thereunder without the prior written consent of the Government.

23 TESTING AND COMMISSIONING OF ESM

23.1 Provisional Testing

The ESCO shall conduct end-to-end connection testing for connectivity after all ESM, equipments and materials and equipment configurations required for connectivity have been procured and completed and the Government agrees to provide all necessary assistance and to comply with any directions which the ESCO may provide in order to ensure that the end-to-end connection testing is completed successfully.

23.2 Final Testing

Upon the successful completion of the end-to-end connection of the provisional testing which is referred to in the provisions of Clause 23.1 the ESCO shall issue a notice to commence on the final testing to the Government for the Government Representative to witness the same.

23.3 Acceptance

The Government Representative shall issue a Certificate of Acceptance upon the satisfaction of the Government Representative that the said testing was done pursuant to the terms of contract and that it was duly certified by a Professional Engineer as engaged by the ESCO and that the ESCO successfully complied and obtained a compliance certificate from the Statutory Body as the case may be.

23.4 Standard Procedure

The ESCO shall conduct the testing and commissioning for the ESM according to its standard procedure acceptable to the Government's requirements.

24. MAINTENANCE OF THE SERVICES

24.1 Scope of Maintenance Services

Maintenance Services includes periodic equipment inspection, tests, and calibrations, preventive maintenance tasks, and corrective actions required to sustain and restore energy system operational status to achieve all facility and energy conservation performance requirements of this contract.

24.2 Responsibility for Maintenance

The ESCO shall be responsible for maintenance of all ESM installed. Installed ESM shall include all ESCO-installed equipment and those portions of Government's equipment that have been modified or replaced to achieve proposed ESM performance.

24.3 Work Schedule on Maintenance

24.3.1 The ESCO shall submit a work schedule on maintenance of the ESM to the Government for approval within fourteen (14) days after the issuance of the Certificate of Acceptance.

24.3.2 The ESCO shall make all necessary provisions to keep interferences to a minimum as to the scheduling work and storage of materials and shall confine its operations, materials, and equipment within the immediate vicinity of the work. ESCO shall prearrange or schedule with the Government for all disruptive noise-producing construction activities so as not to unreasonably obstruct or interfere with any activities of the Government. The Services shall be coordinated and planned in a manner that will permit operation of the Government's Facility without interruptions.

24.4 Interruption of Electrical Service

The ESCO will schedule interruption of electrical service so as to minimize such interruption to Government operations. Interruptions shall be permitted only on Saturday, Sunday and public holidays. The ESCO shall notify the Government, in writing, at least fifteen (15) days in advance of any proposed interruption and shall obtain the approval of the Government prior to the interruption. Scheduled interruptions of electrical service shall not exceed twelve (12) hours.

24.5 Government-owned Facilities

If the performance of ESCO ESM is dependent on certain Government-owned facilities, systems, or equipment the ESCO may indicate specific requirements for Government maintenance practices in the Energy Audit Report. Such required maintenance practices will be performed by the Government provided that they are described in full in the Energy Audit Report attached as Appendix ____ and the ESCO has provided any training needed to enable Government personnel to perform maintenance practices to ESCO's satisfaction. ESCO shall provide any such training at ESCO's sole expense.

24.6 Repair of Equipment

When Government-owned equipment fails or is damaged or destroyed due to ESCO, the ESCO will be responsible for repairs within a reasonable time period. The ESCO shall provide repairs, at no expense to the Government.

24.7 ESCO's Point of Contact

The ESCO shall establish a point of contact (name and phone number) for use by the Government in providing response to ESCO equipment failures. Initial telephone response to repair call messages shall be within 60 minutes. If the Facility visit is needed to repair equipment, repair personnel shall arrive on the Facility within five hours for repairs.

24.8 Manufacturers' Warranties

The ESCO shall keep in effect all manufacturers' or other third party warranties relating to the ESCO-installed equipment and ensure that any benefits due to such warranties are passed on to the Government at the time the Government becomes the owner of the equipment.

25. TRAINING FOR ESM

25.1 Training Prior to Installation Completion

Fourteen (14) days prior to the installation completion, the ESCO shall train Government personnel as required to operate, maintain ESM equipment and systems.

25.2 Training Prior to Contract Expiration

The ESCO shall train Government's and Facility Manager's personnel to operate, maintain, and repair ESM equipment 90 days prior to the end of the contract term or within 90 days after notice by the Government in the event of early termination.

25.3 Scope of Training

The training program described in the Technical Specifications shall provide instruction on operation, troubleshooting, maintenance, and repair of ESM. Training shall include both theory and a practical instruction. Course materials shall include ESCO-supplied operation and maintenance plans and manufacturer-supplied manuals. The program shall be conducted at the facilities where the ESM are located.

26. UTILITIES, WATER AND ELECTRICITY

The ESCO will be allowed to use water and electricity for construction purposes without charge.

27. EVENTS AND CONSEQUENCES OF DEFAULT BY THE ESCO

27.1 Default of Obligations

- (a) In the event that the ESCO-
- (i) fails to commence its Services within 2 weeks from the commencement date;
 - (ii) fails to design, supply and install the ESM within the period set out in this Contract;
 - (iii) suspends or abandons the carrying out of the Services or any part thereof before the date of completion;
 - (iv) fails to proceed regularly and diligently with the performance of its obligations under this Contract;
 - (v) fails to execute its Services in accordance with the Contract;
 - (vi) persistently neglects to carry out its obligations under the Contract;
 - (vii) refuses or persistently neglects to comply with a written notice from the Government Representative and/or the Government in relation to any accident, failure or event occurred or defective design which do not meet the requirements of the Contract;
 - (viii) fails to produce the guaranteed energy savings as per clause _____ consistently throughout the Contract Period; or
 - (viii) fails to comply with any terms and conditions of this Contract,

then Government Representative shall give written notice to the ESCO specifying the default, and requiring the ESCO to remedy such default within 14 days of the receipt of the default notice or any period determined by the Government Representative.

(b) Termination

If the ESCO fails to remedy the breach within the period specified in clause 28.1 (a) of this Contract, the Government Representative shall have the rights to forthwith terminate this Contract by giving a written notice to that effect.

(c) Consequences of Termination

- (i) If this Contract is terminated under clause 28.1 (b), the ESCO shall-
 - (A) forthwith cease its Services;

- (B) remove its Professional Engineer, Graduate Engineer, Site Staffs or employees from the Facility;
 - (C) allow third party to enter into a contract with the Government or any person deemed necessary by the Government for the purpose of carrying out or completing the Services;
 - (D) at no cost to the Government, hand over to the Government all equipments and materials and other relevant documents relating to the Services;
 - (E) pay to the Government for any losses and damages as a result of termination of this Contract in the manner as determined by the Government; and
 - (F) not be released from any of its obligations under the Contract.
- (ii) The Government shall –
- (A) call upon the Performance Bond or forfeit the performance guarantee sum, and/or call upon the Design Guarantee Bond;
 - (B) enter and repossess the Facility;
 - (C) be entitle to carry out and complete the Services on its own or employ any other person to carry out and complete the Services; and
 - (D) be entitled to claim against the ESM for any losses and damages suffered as a result of the termination of this Contract.
- (iii) Nothing in clause 27.1 or anything else contained in this Contract shall render the Government in any way liable for payment upon termination.

27.2 General Default

(a) Events of Default

If at any time during the subsistence of this Contract-

- (i) the ESCO becomes insolvent or compounds with or enters into an arrangements or compositions with its creditors;
- (ii) an order is made or resolution is effectively passed for the winding-up of the ESCO (except for the purpose of restructuring

or amalgamation with the written consent of the Government, which consent shall not be unreasonably withheld);

- (iii) a provisional liquidator, receiver or manager of its business or undertaking duly appointed, or possession taken by or on behalf of creditors or debenture holders secured by a floating charge of any property comprised in or subject of the floating charge; or
- (iv) execution is levied against a substantial portion of the ESCO's assets, then the Government shall have the right to terminate this Contract forthwith by giving notice to that effect.

(b) Consequences of Termination

- (i) In the event that this Contract is terminated under Clause 27.2 (a), then clause 27.1 (c)(i) and (ii) shall apply.
- (ii) Nothing in clause 27.2 or anything else contained in this Contract shall render the Government in any way liable for payments upon termination.

27.3 Total Failure of ESM

If the ESM continues to fail for 30 days after notice to the ESCO requesting such failure to perform be remedied, the Government shall terminate the Contract and clause 27.1 (c)(i) and (ii) shall apply. For the purpose of this Contract, total failure shall deem to mean failure on the functionality of the ESM.

27.4 Nothing in clause 27.3 of this Contract or anything else contained in this Contract shall render the Government in any way liable for payments upon termination.

28. TERMINATION ON CORRUPTION, UNLAWFUL AND ILLEGAL ACTIVITIES

28.1 Without prejudice to any other rights of the Government, if the ESCO, its personnel, servants or employees is convicted by a court of law for corruption or unlawful or illegal activities in relation to this Contract or any other contract that the ESCO may have with the Government, the Government shall be entitled to terminate this Contract at any time, by giving immediate written notice to that effect to the ESCO.

28.2 Upon such termination -

- (a) clause 27.1 (c)(i) and (ii) shall apply accordingly;
- (b) the Government shall be entitled to all losses, costs, damages and expenses (including any incidental costs and expenses) incurred by the Government arising from such termination; and

- (c) Nothing in clause 28.1 of this Contract or anything else contained in this Contract shall render the Government in any way liable for payments upon termination.

29. TERMINATION ON NATIONAL INTEREST

29.1 Termination

- (a) Notwithstanding any provision of this Contract, the Government may terminate this Contract by giving not less than 30 days written notice to that effect to the ESCO, without any obligation to give any reason thereof if the Government considers that such termination is necessary for national interest, national policy or national security.
- (b) For the purpose of this clause, what constitutes "national interest", "national policy" and "national security", shall be solely made and determined by the Government and such determination shall for all intent and purposes be final and conclusive and shall not be open to any challenge whatsoever.

29.2 Consequences of Termination

Upon such termination of this Contract under clause 29.1 of this Contract-

- (i) clause 27.1 (c)(i) and (ii) shall apply; and
- (ii) payment obligations including all costs and expenditure incurred by the Government and the ESCO shall be ascertained as determined by the Government.

30. OWNERSHIP AFTER CONTRACT EXPIRATION

At the expiration of the Contract Period, all right, title, and interest in and to all improvements and equipment constructed or installed on the premises and additions, shall vest in the Government at no additional cost free and clear of all and any liens and encumbrances created or caused by the ESCO. ESCO shall surrender possession of the Facility and the improvements and equipment to the Government in good repair and condition, reasonable wear and tear accepted.

31. SURVIVING RIGHTS

Any termination under this Contract shall not affect the liability of either party hereto for any of its acts or omission during the period of the Contract and both parties shall thereafter continue to be so liable and shall keep the other party hereto indemnified and hold harmless in respect of any claims arising therefrom.

32. FORCE MAJEURE

32.1 Non Breaching of Contract Obligations

Neither the Government nor the ESCO shall be in breach of its obligations under this Contract if it is unable to perform its obligation under this Contract (or any part of thereof), other than the payment obligations as a result of the occurrence of an Event of Force Majeure.

32.2 Events of Force Majeure

An "Event of Force Majeure" is an event beyond the control of both parties which are:

- a) war (whether declared or not), hostilities, invasion, act of foreign enemies;
- b) insurrection, revolution, rebellion, military or usurped power, civil war, terrorism;
- c) natural catastrophe including but not limited to earthquakes, floods, subterranean spontaneous combustion or any operation of the forces of nature against which an experienced ESCO could not be reasonably have been expected to take precautions;
- d) nuclear explosion, radioactive or chemical contamination or radiation (unless caused by the negligence act, omission or default of the ESCO, its agent or personnel);
- e) pressure waves caused by aircraft or other aerial devices traveling at sonic or supersonic speeds; and
- f) riot, commotion or disorder, unless solely restricted to employees of the ESCO or its personnel, servants or agents.

32.3 Management of Force Majeure

PROVIDED THAT an Event of Force Majeure shall not include financial inability on the part of the ESCO to perform his obligations under this Contract.

- a) If an Event of Force Majeure occurs by reason of which either party is unable to perform any of its obligation under this Contract (or any part thereof), the party shall inform the other party immediately of the occurrence of that Event of Force Majeure with full particulars thereof and the consequence thereof.
- b) If either party considers the Event of Force Majeure to be of such severity or to be continuing for such period of time that it effectively frustrates the original intention of this Contract, then the parties may agree that this Contract be terminated upon mutual agreement of the parties.
- c) If this Contract is terminated by an Event of Force Majeure pursuant to the above clause, all rights and obligations of the parties under this Contract shall forthwith terminate and neither party shall have any claim against the other party and neither party shall be liable to each other save for any rights and liabilities accruing prior to the occurrence of the Event of Force Majeure.
- d) Neither party shall be entitled to rely upon the provisions above if both parties reasonably determine that an Event of Force Majeure has not occurred.

- e) For avoidance of doubt, the parties shall continue to perform those parts of those obligations not affected, delayed or interrupted by an Event of Force Majeure and such obligations shall, pending the outcome of this clause continue in full force and effect.

33. ARBITRATION

- 33.1 If any dispute or difference shall arise between the Government and the ESCO out of or in connection with the Contract, then the parties shall refer such matter, dispute or difference to the officer named in Appendix 1 for a decision.
- 33.2 The decision of the officer named in Appendix 1 shall be in writing and shall subject to clause 33.4, be binding on the parties until the completion of the Services and shall forthwith be given effect to by the ESCO who shall proceed with the Services with all due diligence whether or not notice of dissatisfaction is given by him.
- 33.3 If the parties –
- (a) fail to receive a decision from the officer named in Appendix 1 within forty-five (45) days after being requested to do so; or
 - (b) are dissatisfied with any decision of the officer named in Appendix 1,
- then such dispute or difference shall be referred to arbitration within forty-five days to an arbitrator to be agreed between the parties and failing such agreement, to be appointed by the Director of the Regional Centre for arbitration in Kuala Lumpur on the application of either party hereto. Such arbitration shall be heard at the Kuala Lumpur Regional Centre for Arbitration and shall be conducted in accordance with the rules for arbitration of the Kuala Lumpur Regional Centre for Arbitration using the facilities and the system available at the Centre.
- 33.4 Such reference, except on any difference or dispute under clause 66 shall not be commenced until after the completion or alleged completion of the Works or determination or alleged determination of the Contractor's employment under this Contract, or abandonment of the Services, unless with the written consent of the Government and the ESCO.
- 33.5 In the event that such consent has been obtained in accordance with clause 33.4, the reference of any matter, dispute or difference to arbitration pursuant to this clause and/or the continuance of any arbitration proceedings consequent thereto shall in no way operate as a waiver of the obligations of the parties to perform their respective obligations under this Contract.
- 33.6 In any arbitration proceedings conducted pursuant to clause 33.3, the parties may make any counter claim in relation to any dispute or difference arising from the Contract.

- 33.7 The arbitrator shall have power to review and revise any certificate, opinion, decision, requisition or notice and to determine all matters in dispute which shall be submitted to him, and of which notice shall have been given in accordance with clause 33.3 aforesaid, in the same manner as if no such certificate, opinion, decision, requisition or notice had been given.
- 67.8 Upon every or any such reference the costs of such incidental to the reference and award shall be in the discretion of the Arbitrator who may determine the amount thereof, or direct the amount to be taxed as between solicitor and client or as between party and party, and shall direct by whom and to whom and in what manner the same be borne, award and paid.
- 33.9 The award of the Arbitrator shall be final and binding on the parties.
- 33.10 In the event of the death of the arbitrator or his unwillingness or inability to act, then the Government and the ESCO upon agreement shall appoint another person to act as the arbitrator, and in the event the Government and the ESCO fail to agree on the appointment of an arbitrator, an arbitrator shall be appointed by the Director of the Regional Centre for Arbitration in Kuala Lumpur.
- 33.11 In this clause, "reference" shall be deemed to be reference to arbitration within the meaning of the Arbitration Act 2005.
- 33.12 The arbitration shall be governed by the Arbitration Act 2005 and the laws of Malaysia.

34. LAW GOVERNING THIS CONTRACT

- 34.1 This Contract shall be governed by and construed according to the laws of Malaysia and the parties irrevocable submit to the exclusive jurisdiction of the courts of Malaysia.
- 34.2 The ESCO binds himself to acknowledge and accept as final in all respects within the country of domicile of the ESCO or elsewhere, any decision or award of an Arbitrator or judgment in any court of Malaysia in relation to any dispute between the parties under this Contract.
- 34.3 This clause shall apply in all respect in case any such decision award or judgment is to be enforced in the courts of the country of domicile of the ESCO or elsewhere in any manner. However; if the country of domicile of the ESCO is not party to the 1958 New York Convention on the Recognition and Enforcement of Foreign Arbitral Awards and the Reciprocal Enforcement of Judgment Act, 1958, the principal of common law shall apply.

35. AMENDMENT

No modification, amendment or waiver of any of the provisions of this Contract shall be effective unless made by mutual consent and made in writing by way of supplementary agreement specifically referring to this Contract and duly signed by

the Parties. The provisions in respect of such amendment, variation or modification thereof shall be supplemental to and be read as integral part of this Contract and shall remain in full force and effect as between both parties.

36. CONFIDENTIALITY

36.1 This Contract and all such drawings, records, data, books, reports and all matters pertaining hereto shall be considered as confidential matter and shall not be disclosed to any third party without prior written mutual agreement, save and except where –

- (a) disclosure of such information is necessary for the purposes of raising finance to undertake the obligations of the ESCO under this Contract;
- (b) disclosure of such information is made to the ESCO's consultants, auditors or advisers;
- (c) disclosure of such information is required by law or by any government agency or for the performance of any obligations under this Contract; or
- (d) the information has entered public domain.

36.2 The restrictions contained in this clause shall survive the termination of this Contract and shall continue to bind both parties without limit in point of time.

37. STAMP DUTY

All costs for the preparation of this Contract including the stamp duty, if any, shall be borne by the ESCO.

38. NOTICES

38.1 Any notice, approval, consent, request or other communication required or permitted to be given or made under this Contract shall be in writing in Bahasa Malaysia or English language.

38.2 Such notice shall be effected by:

- (a) hand delivery or courier and an acknowledgement of receipt obtained;
- (b) leaving the notice at the registered office or site office (if any) of the ESCO in which case it shall be deemed to have been duly delivered; or
- (c) registered post in which case it shall be deemed to have been received seven (7) days after the date of posting.

- 38.3 The address of the Government and the ESCO is as shown below or such other address as either party may have notified the sender:

to the Government:
Address:

to the ESCO:
Address:

- 38.4 It shall be the duty of the parties to notify the other if there is a change of address or entity by giving a written notice within fourteen (14) days. In the event of the ESCO failing to notify the Government Representative of such address or any change in his address, such written notices and instructions shall be deemed to have been served upon the ESCO if they are sent in the manner stated above to the address stated in this Contract or to the ESCO's site office (if any).

39. TIME

Time whenever mentioned shall be of the essence of this Contract.

SECTION 2: GENERAL SPECIFICATIONS**2.1 INSTRUCTION TO TENDERER**

- 2.1.1 General** The Government wishes to draw the attention of the Tenderer that upon successful bidding of this tender, he will be appointed as the Energy Services Company (ESCO) for the works specified in this specification.
- 2.1.2 Details to be Submitted by Tenderer** The Tenderer must submit, together with his tender on the form provided, details of Heads and Sub-Heads of registration, organisation, giving details of names, identity card numbers, addresses etc. and a brief resume of all managerial, technical and clerical staff, and works that he has in hand, giving details of the contract price, the original completion date, the progress achieved to date, and the name or designation of the energy manager, architect, engineer or quantity surveyor to whom reference may be made.
- 2.1.3 Tenders** Tenders for the system shall be submitted on a lump sum basis, for works, supply, installation, testing, commissioning and operating of the system as described further in this Specification and the tender price shall include all charges for transport, handling, Government Custom Duties, Sales Tax and other taxes where applicable, and all charges for the servicing and maintenance of the complete system during the contract period.
- It is to be clearly understood that the successful Tenderer shall pay all Government Custom Duties and any other taxes which may be payable on all materials for use in the work to be performed under this Specification, and no tax exemption certificates will be issued by the Jabatan Kerja Raya.
- 2.1.4 Price Fluctuation**
- (a) The attention of the Tenderer is drawn to the fact that "no rise and fall" condition shall apply to the **Energy Saving Measure (ESM)** in this Contract.
 - (b) The costs for the **Energy Saving Measure** to the Government are to be on a firm basis and no claims will be entertained for adjustment to the cost of the **Energy Saving Measure** due to fluctuation in the cost of energy tariffs, labour, materials and all Government duties and taxes during the contract period.

- 2.1.5 Tenderer's Drawings** If the Tenderer's offer differs substantially from the existing design, then the Tenderer shall submit together with his tender general dimensioned drawings showing all the major items of the equipment being offered so as to show the suitability of the equipment arrangement within the allocated space.
- 2.1.6 Alternative Offer** Any alternative offer to the system, as specified, or to the equipment must be clearly stated and described by the Tenderer.
- 2.1.7 Schedule of Technical Data of Equipment Offered** The Tenderer is to furnish manufacturer's technical pamphlets giving full technical data of all equipment to be supplied by him and shall complete the Schedule of Technical Data of Equipment Offered as set out herein for all the equipment to be supplied.
- Particulars of the equipment offered shall be clearly marked in the pamphlets, and to be bound in the same order as in the Schedule of Technical Data.**
- Tenders which do not comply fully with the requirements of this clause will not be considered and failure of the Tenderer to furnish manufacturer's technical pamphlets and the required technical data, shall be construed as being the equipment offered by him do not meet with the requirements of this Specification.
- 2.1.8 Schedule of ESM Cost** The Tenderer shall complete the Schedule of ESM Cost. All costs quoted shall be inclusive of Government Custom Import Duty and Government Surtax at current rate.
- 2.1.9 Delivery and Completion** The Tenderer is to state, at the time of tender, in the form provided, the period required for delivery of the equipment to site and the period required for completion of the entire installation, both relative to the date of notification of acceptance of tender.
- 2.1.10 Service Contract** The Tenderer shall, at that time when he submits his tender, include complete Service, Repair and Maintenance of the ESM, as described in the Technical Specifications, for the entire contract period.

2.2 WORKMANSHIP AND MATERIALS REQUIRED FOR THE SUPPLY AND INSTALLATION OF COMPLETE ENERGY SAVING MEASURE

Program of Energy Saving Measure

2.2.1 Application

The provision of this section of the Specification is supplementary to, and is to be used in conjunction with, the Conditions of Contract PWD #_____. The clauses of the said Conditions of Contract, shall form part of this Specification as fully and completely to all intents and purposes as though all the clauses therein have been embodied in this specification.

The ESCO must ensure that he is registered with the Ministry of Finance, under the correct Heads and Sub-Heads, in the class registration eligible for similar work as specified herein, and up to the value proposed.

The ESCO is to note that the **Energy Saving Measure (ESM)** installation shall be executed in compliance with all the relevant regulations prevailing at the time.

2.2.2 Scope of Works

(a) The work included in this element, in accordance with attached drawings as listed in the Technical Specification, is as listed hereunder:

- (i) Supplying, installing, testing, commissioning and operating of a complete **Energy Saving Measure**, as described in ESCO's proposal.
- (ii) Servicing, repairing and maintaining the above-mentioned system, for the entire contract period from the completion date in good operating condition.

The Main Items of Equipment for the system are as listed in the Schedule of Equipment.

(b) If ESCO wishes to propose addition / exchange / upgrade to the ESM which is not in the original ESCO's proposal as per paragraph 2.2.2(a)(i) after the commencement date of the contract, ESCO shall propose such variation to the Government's Representative.

The Government's Representative may not give permission for the modifications should Government's Representative considers such modifications proposed are not to the best interest of the installation.

2.2.3 Statutory Regulations

All work to be performed under this Specification shall be in accordance with good engineering practice and shall comply with the Rules and Regulations of the:

- (a) Jabatan Keselamatan dan Kesihatan Pekerjaan
- (b) Suruhanjaya Tenaga/Tenaga Nasional Berhad
- (c) Jabatan Kerja Raya/Jabatan Bekalan Air
- (d) Jabatan Perkhidmatan Bomba & Penyelamat Malaysia
- (e) All other authorities having jurisdiction over the whole or part of the **Energy Saving Measure** in the locality.

The ESCO shall obtain, and fill in, all notices required by the above-mentioned authorities, as necessary, and shall obtain all consents necessary for the various works to be executed by him, and shall pay all fees in connection therewith.

2.2.4 Supervision

The ESCO shall have a Professional Engineer / Architect / Registered Electrical Energy Manager, registered with professional body and/or Suruhanjaya Tenaga, to be in charge of the work on the premises at any time. This Professional Engineer / Architect / Registered Electrical Energy Manager must be thoroughly competent in the supervision, installation, testing and commissioning of the **Energy Saving Measure** and must be acceptable to the Government's Representative.

2.2.5 Workmanship

The work described in this Specification shall be performed by workmen skilled in the installation, testing, commissioning and servicing of the aforesaid equipment. All necessary work shall be executed in good workmanlike manner so as to present a neat and finished appearance.

The Government's Representative shall decide whether or not the finished piece of work is satisfactory, and if in its opinion, any material or equipment has not been properly installed or finished, the ESCO must replace the material or equipment in a manner entirely satisfactory, and without additional cost, to the Government.

2.2.6 Materials

All materials and equipment to be supplied under this Specification, shall be new and unused and shall generally be of the best quality, as regards to design, safety, manufacture and performance. All equipment offered shall be from reputable manufacturers, with an established local agent in this country who maintains a ready supply of spare parts and trained personnel, to ensure effective subsequent maintenance of the same.

2.2.7 Obvious Work

The ESCO shall provide all materials and fittings, and perform any work which is obviously necessary to the proper and efficient function of the **Energy Saving Measure** even though such materials, fittings, or works may not be explicitly mentioned in this Specification, or shown on the drawings attached to this Specification. The supply of all that is requisite for the complete system together with the installation, testing, commissioning and handing over to the Government, in good operating condition, shall be the undivided responsibility of the ESCO.

2.2.8 Drawings**(a) Working Drawings**

Within ninety (90) days of acceptance of tender, or such shorter period, as may be required by the Government's Representative, the ESCO shall submit five (5) sets of dimensioned drawings showing all details of the equipment, and other necessary Builder's Work in connection with the installation to the Government's Representative. The drawings submitted shall be modified, as necessary, if requested by the Government's Representative, and resubmitted for final approval.

Important Note:

Detailed Working Drawings of any equipment to be fabricated locally, must be submitted to the Government's Representative for approval before fabrication. These drawings shall incorporate a complete list of all materials to be used in the fabrication, as well as their sizes and gauges.

(b) As-built Drawings

The ESCO shall maintain on site, a complete set of the approved drawings which shall be updated progressively to show accurately the works as executed to-date.

The As-built drawings shall be completed and approved within 30 days after scheduled completion date. Within one (1) week of receiving the Government's Representative's comments and requirements, the ESCO shall make all necessary amendments and resubmit five (5) sets of prints to the Government's Representative for final approval.

The ESCO shall furnish to the Government's Representative a complete set of reproducible transparent prints or on compact disc (CD) and five (5) sets of bound ordinary prints of the as-built drawings, within two (2) weeks after certification by ESCO's Professional Engineer / Architect / Registered Electrical Energy Manager, whichever applicable.

(c) Samples & Mock-ups

(i) Any works related to architectural green and energy efficiency materials shall be set up mock up samples as required by the Government's Representative complete with colour schemes and

other items such as plastering, roof material (concrete tiles, metal decking, concrete slab roof, clay tiles, solar panel) with insulation, external wall and façade (paint, prefabricated panels/blocks; [pre-cast concrete panel, aerated lightweight concrete panel, glass panel (curtain wall)], timber panel or composite panel, Low-E glazing window, clay brickwall, gypsum board, aluminum cladding), and etc. that are required to be approved by Architect and endorsed by Government's Representative's concurrence prior to actual installations and maintenance.

- (ii) Samples of all finishes and accessories shall be submitted and prior concurrence obtained from the Government's Representative before supply and installation. Samples shall be properly mounted on sample boards.
- (iii) The ESCO shall arrange factory / show room visits prior to the production and selection of materials and etc.
- (iv) The ESCO shall submit certificate from authorized body to certify the proposed green or energy efficiency materials.

2.2.9 Schedule of Works The ESCO, before proceeding with the work, shall prepare in-cooperation with the Government and other trades a Schedule of Works. This Schedule shall be kept up-to-date as the work progresses.

2.2.10 Proprietary Names Whenever proprietary names are mentioned in this Specification, or in the Drawings they are indicative of type and quality only. Articles of alternative manufacture may be considered provided they are equal in all respects as regards to design, quality, appearance and finish.

2.2.11 Operating Instructions The ESCO shall supply three (3) copies of operating instructions which shall indicate clearly the sequence of operations for the installed system. The operating instructions shall be completed with an "As-built" wiring diagram and a schematic layout of the complete installed system. One (1) copy of the operating instruction shall be supplied permanently mounted in a glazed frame to be hung on the plant room / control room or any other area to be decided by the Government's Representative.

2.2.12 Repair Manual and Spare Parts Book The ESCO shall supply three (3) complete sets of repair manuals and spare part books for all relevant installed equipment.

2.2.13 Testing and Commissioning

On completion of the installation work for the complete **Energy Saving Measure** the ESCO shall carry out tests on all individual sections of the system to prove that the individual capacities specified for all equipment, can be produced and maintained.

The ESCO shall also carry out tests on the system as a whole, to prove that the installation has been properly adjusted, and calibrated, to produce the required guaranteed performance, as called for according to the specification of this Tender.

The ESCO shall notify the Government's Representative when these tests are to take place so that a Government's personnel may be present to observe the tests. **A detailed Test Results Recording Format shall be submitted for approval by the Government's Representative, prior to the commencement of these tests.**

Further adjustments to the system shall also be made whilst the building is occupied, and the installation is in use, during the contract period. No additional cost shall be charged in carrying out these adjustments.

A complete record of the tests, and results of such test (whether successful or otherwise) shall be kept up-to-date by the ESCO. At the conclusion of all the tests on the installed system, these records shall be collected and two (2) bound sets provided to the Government's Representative within thirty (30) days. During the progress of the tests, preliminary copies of the results may also be required by the Government's Representative.

2.2.14 Format of Required Submissions

Notwithstanding the clauses above, the ESCO shall submit the following documents to the Government's Representative, after completion date:

(a) Test Results

- **Completed Test and Commissioning results signed by authorised parties, in A4 size.**
- **List of further test, rebalancing, readjustment etc., which need to be carried out after the occupation of the building.**
- **List of Defects discovered during commissioning which has not been rectified.**

(b) As-Built Drawings

- **Approved As-built Drawings - folded and bound in hard cover A4 size.**
- **Transparent Print Copies or on Compact Disc (CD), if specified in contract.**
- **Brief description of installation.**

(c) Training

- **Schedule of Training, including theory and practical instruction, during the contract period.**
- **Proposed Mode of Training: Theoretical Briefings, Hands-On Demonstration, Audio-Visual Aids etc.**
- **List of Targeted Personnel: Engineers, Facility Managers, End Users / Owners, Technical Assistants, Technicians, etc.**

(d) Operation And Maintenance

- **Manufacturer's recommended operation and maintenance procedures.**
- **List of Equipment, with capacity/size and catalogues.**
- **List of Equipment installed.**
- **Trouble Shooting Chart and recommended action.**
- **Operational Safety Guidelines.**
- **List of recommended spares.**
- **List of spares/duplicate items supplied.**
- **List of recommended basic maintenance tools.**
- **Repair manual and Spare Parts Book.**
- **Charts, Circuit Diagrams, Certificate of approval, where applicable.**
- **List of Consumable Items supplied and their quantity.**

- **Maintenance Schedule during entire contract period and Check List.**
- **Up-to-date Contact Address of Maintenance Personnel, and Phone Numbers.**

2.2.15 Failure to Comply With Space Limitation

Should the whole, or part, of the installation fail to fit into the space allocated, the ESCO shall be required to carry out the necessary modifications or even replace the work with an alternative at his own cost.

The Government's Representative may not give permission for space modifications should he consider such modifications proposed are not to the best interest of the installation.

2.2.16 Failure to Achieve Guaranteed Savings

Should the whole, or part, of the installation fail to produce the required savings as guaranteed in the tender, the ESCO shall be required to carry out necessary modification at his own cost or otherwise ESCO shall compensate for shortfall in the guaranteed savings.

2.2.17 Maintenance and Guarantee

The ESCO is required to guarantee all installed equipment from the date of completion of the installation until expiry of the contract. This guarantee shall include the equipment manufacturer's warranties and the ESCO's own guarantee on all materials supplied and installed by him, and his workmanship. During the above-mentioned contract period, the ESCO shall provide **maintenance** to all the installed equipment in the complete installation, so that the system is maintained in good running order. The maintenance shall include systematic examination, cleaning, adjustment and lubrication.

During the contract period, the ESCO shall also provide any other service as required by the Government, in the event of a breakdown of the ESM. Repairs and replacements of defective components due to poor materials and workmanship is required to be furnished free of charge by the ESCO.

Any part of the equipment, and all accessories or fittings, found to be defective shall be replaced by the ESCO at the ESCO's sole expense under, and subject to, the same conditions as the original equipment was supplied. In case of failure by the ESCO to replace any defective equipment as by this clause provided, the Government may purchase equivalent replacement elsewhere, and all costs in connection therewith shall be deducted from any money due to the ESCO under this contract.

**2.2.18 Responsibilities of
The ESCO**

The ESCO shall also be responsible for :-

- (a) affording free, and full, use of standing scaffolding while it remains so erected upon the site;
- (b) clearing away and removing all rubbish and debris;
- (c) unloading, getting in, storing, and all handling and hoisting of his materials, plant and tools into the required positions;
- (d) the provision of all fuel, gas, steam and other services required, but excluding water and electrical power that may be required for the test running, testing and balancing, and commissioning of the installation; and
- (e) the provision, erection, maintenance and removal of all his temporary office, workshop and workmen's accommodation, including paying all assessment and other charges.

2.3 GOVERNMENT'S PROCUREMENT POLICY

2.3.1 Government's Procurement Policy on Imported Goods and Foreign Services

- a. In line with Government's Procurement Policy on Imported Goods and Foreign Services, the Tenderer shall be deemed to have allowed in his tender all cost and time necessary for full compliance with the Special Provision to the Conditions of the Contract regarding the Restriction and Procedure on the Use of Imported Materials and Goods.
- b. The Tenderer will not be permitted to import any materials, plants, equipment, vehicle or other goods to be incorporated into the ESM or supplied under the Contract except those approved by Ministry of International Trade and Industry (MITI).

2.3.2 Restriction and procedure on use of Imported Goods

- a. Notwithstanding anything to the contrary contained in the Contract, no imported materials, plants, equipment, vehicles or other goods except those approved by the Government, as listed hereof, shall be incorporated into the ESM or supplied under the Contract.
- b. The Tenderer shall ensure that the procurement of imported materials, plant, equipment and vehicles or other goods approved by the Government are obtained directly from the country of origin based on F.O.B. or other similar basis. The transportation and insurance of such imported materials, plant, equipment and vehicles or other goods from the country of origin to the site shall be arranged by the Tenderer through the Government's Multi Modal Transport Operators (herein after referred to as "MTO") as specified in this Contract. The Tenderer shall allow in his tender all costs and time required in complying with the requirements of this Clause including the cost required for the services provided by the MTO.
- c. The Tenderer shall submit documentary evidence of compliance with this Clause to the Government's Representative within one (1) month from the date of each delivery to the site of such materials, plant, equipment and vehicles or other goods.

2.3.3 Government's Multimodal Transport Operator

The Tenderer is required to procure the services of multimodal transport operator (MTO) as provided for under Surat Arahan Perbendaharaan (SAP) dated 31 July 2009 or any latest version of such SAP. The Tenderer shall obtain the necessary information regarding this ruling from Ministry of Finance, Malaysia.

2.3.4 Standard Specification for Building Works, Equipment & Materials

The materials of Malaysian Origin and/or locally manufactured materials shall be used by the Tenderer to the exclusion of imported materials and he shall allow for this special requirement in his tender.

The locally manufactured materials are as listed in the 'Senarai Bahan-Bahan Binaan Tempatan', issued by the Kumpulan Ikram Sdn. Bhd. (formerly known as IKRAM) or those which comply with the relevant Malaysian Standard. Other local materials shall be tested and certified by Kumpulan IKRAM Sdn. Bhd. for civil engineering materials or approved by Jabatan Kerja Raya Malaysia for other materials before they can be accepted for use in the ESM by the Government's Representative. Testing and certification by other testing body may be allowed with the Government's Representative approval.

If the Tenderer fails to comply with this requirement, the materials supplied shall be rejected and disciplinary action shall be imposed upon the Tenderer.

SECTION 3: TECHNICAL SPECIFICATIONS**3.1 SCOPE OF WORKS****3.1.1 General**

- (a) The work comprises performing Energy Saving Measure with the objective to reduce monthly energy consumption as much at least to the agreed guaranteed saving level.
- (b) Maintain the guaranteed saving every month along the Energy Saving Measure period till the end of the contract period.

3.1.2 Detailed Energy Audit

- (a) Conduct energy audit to identify relevant existing conditions of applicable facilities following provided requirement details. The energy audit shall identify all feasible energy conservation, load management, and renewable resource options with benefits exceeding costs over the contract term.
- (b) Prepare comprehensive energy audit report including baseline, guaranteed saving and proposal of Energy Saving Measure (ESM) for submission to the Government.

3.1.3 Energy Saving Measure (ESM)

- (a) Propose Energy Saving Measure (ESM) in optimization of operation, enhance system/equipment efficiency or/and install additional equipment to reduce energy consumptions.
- (b) Prepare engineering analysis of each ESM proposed, amount of saving, cost and return of investment for approval.
- (c) Execute each of ESM approved, monitor and verify the result from the implementation of ESM. **ESCO shall maintain operation of ESM to ensure the guaranteed saving is achievable.**
- (d) Conduct comprehensive testing and commissioning of each ESM.
- (e) Conduct comprehensive service and maintenance for the entire contract period for the equipment installed under ESM.

3.1.4 Measurement & Verification (M&V)

- (a) Develop measurement & verification plan for each ESM to be approved by the Government's Representative. Develop M&V procedure/manual for each ESM.
- (b) Conduct measurement & verification activities on each ESM to quantify saving from implementation of ESM.

3.1.5 Awareness on Energy Conservation

Take initiatives to raise awareness amongst building users on energy conservation with emphasis on roles that can be performed by users to conserve energy and reduce energy consumption in the building. However, it is advisable to coordinate with the users and Government Representative in advance.

3.2 SPECIFICATIONS FOR ENERGY AUDIT

3.2.1 General

Following issuance by the Government, the selected ESCO shall conduct an Energy Audit of facilities and energy systems at the project site to substantiate the ESCO's ability to achieve the estimated total cost savings.

3.2.2 Energy Audit Requirement

3.2.2.1 The Energy Audit shall identify the relevant existing conditions of applicable Government facilities, including but not limited to:

- (a) compliance of scope to be included: facilities, systems and proposed ESM;
- (b) building physical condition, i.e., assumptions on current and proposed facility or energy system operating conditions;
- (c) hours of use or occupancy;
- (d) area of conditioned space;
- (e) inventory of energy-consuming equipment or systems;
- (f) energy-consuming equipment operating conditions and loads;
- (g) energy consumption baseline;
- (h) proposed construction and M&V schedule;
- (i) energy savings calculations using formulae and procedures based on accepted engineering principles, including synergistic effects of other ESM; and
- (j) cite references used for data, assumptions or empirical formulas.

3.2.2.2 For each ESM identified, the ESCO shall provide a detailed analysis documenting the proposed annual energy savings performance of the ESM after installation, startup and testing.

3.2.2.3 The ESCO shall document the results of the Energy Audit Report certified by ESCO's Professional Engineer / Architect / Registered Electrical Energy Manager and submit to the Government in a format agreed by the Government. The documentation shall identify any existing conditions that vary from the Government's provided data. The Energy Audit must include documentation for the proposed energy baseline.

3.3 SPECIFICATIONS FOR ENERGY SAVING MEASURE (ESM)

3.3.1 Restrictions on ESM

ESM installed by the ESCO **shall not** do the following:

- (a) jeopardize the operation or environmental conditions of existing systems or areas such as dedicated computers or computer rooms;
- (b) degrade performance or reliability of existing Government equipment;
- (c) reduce extra capacity that was intentionally included for future growth, mobilization needs, safety, or emergency back-up; or
- (d) involve major modification works (example: chiller replacement, cooling tower replacement, transformers replacement, internal space layout and etc).

3.3.2 Service Interruptions

For any planned utility service interruptions, the ESCO shall furnish a request to the Government's Representative for approval. The request shall identify the affected buildings, utility service, and duration of planned outage.

3.3.3 Facility Performance Requirements of ESM

Installed ESM shall comply with the standards of service such as acceptable temperature and humidity ranges, noise criteria, air quality parameters, lighting levels, and other related factors, as agreed to between the Government and the ESCO. At a minimum, where automated controls of lighting or environmental conditions are to be installed, the Government must have the ability to, or direct the ESCO to, respond within a specified time to temporarily override the air-conditioning and mechanical ventilation (ACMV) and lighting systems for the following parameters.

- (a) Lighting - lighting levels for various spaces/surfaces, control conditions
- (b) ACMV - temperature and humidity zones, setbacks, control conditions
- (c) Energy Management Control System (EMCS) - compatibility with existing direct digital controls, site terminal
- (d) Environmental - noise, air quality, other
- (e) Major Energy Using Systems - power quality
- (f) Others

3.3.4 Installation Requirements for ESM

3.3.4.1 Design and Construction

3.3.4.1.1 The ESCO shall prepare and submit a design and construction to the Government for review and approval prior to starting ESM installation. Design and construction shall be certified by ESCO's Professional Engineer / Architect / Registered Electrical Energy Manager.

3.3.4.1.2 The design and construction due date will be approved by the Government and specified in the schedule.

3.3.4.1.3 The design and construction shall be prepared and shall include the following:

- (a) Manufacturer's Data - For all ESM equipment to be installed, ESCO shall provide the manufacturer's descriptive literature of equipment including drawings, diagrams, performance and characteristic curves, catalog cuts and installation guidelines and warranty considerations.
- (b) Design Drawings - Design drawings shall be prepared by ESCO and certified by ESCO's Professional Engineer / Architect / Registered Electrical Energy Manager.
- (c) Shop Drawings - Shop drawings shall be prepared by ESCO and certified by ESCO's Professional Engineer / Architect / Registered Electrical Energy Manager.
- (d) Planned Service Interruptions - If any utility services must be discontinued temporarily to perform work, such interruptions shall be described and indicated on the project installation schedule. The description shall include the length of the interruption, its time (date, day of week, time of day, etc.), and a justification.
- (e) Site Plan and Compliance - If an ESM involves the installation of facilities or exterior structures, ESCO shall provide a site plan showing its location, or show its location on the facilities existing site plan. ESCO shall also provide plan and elevation drawings of the facility or exterior structure showing its size and exterior appearance. The site plan shall be certified by ESCO's Professional Engineer / Architect / Registered Electrical Energy Manager.
- (f) Acquisition of Permits - For any ESM installation requiring permits from regulatory agencies, ESCO shall provide its plan and schedule for acquiring such permits in accordance with Government instructions and requirements.
- (g) Installation Schedules - The installation schedule (detailed work program/CPM) shall show the order in which ESCO proposes to perform the work and the dates on which ESCO contemplates starting and completing all major milestones (including acquiring materials, equipment, permits, and inspections). The schedule shall be in the form of a progress chart of suitable scale to indicate the amount of work scheduled for completion by any given date during the installation period.

3.3.4.1.4 Design documents will require both a preliminary and final review by the Government. Each ESM will specify the submission requirements associated with each review.

3.3.4.2 Design and Construction Standards

3.3.4.2.1 Design and Construction Specifications

All design and construction specifications shall comply to JKR's standards and requirements.

3.3.4.2.2 At a minimum, all ESM, works, equipment and materials required for ESM installation shall comply with the most recent issue of the design and construction standards. The following list of standards is provided as a guideline for establishing these requirements.

- MS1525:2007: Code of Practice on Energy Efficiency and Use of Renewable Energy for Non-residential Buildings (First Revision)
- MS IEC 60364: Electrical Installation of Buildings
- Electricity Supply Act 1990
- Electricity Regulations 1994
- Efficient Management of Electrical Energy Regulations 2008
- American National Standards Institute (ANSI)
- National Fire Protection Association (NFPA) Standards
- National Electrical Manufacturers Association (NEMA)
- Underwriters Laboratory (UL)
- Uniform Building By-Laws (UBBL) 1984, latest edition
- American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE)
 - ASHRAE 62: Ventilation for Acceptable Indoor Air Quality
 - ASHRAE 90.1: Energy Standard for Buildings Except Low-Rise Residential Buildings
- Illuminating Engineering Society of North America (IESNA)
- Air-Conditioning and Refrigeration Institute (ARI)
- Occupational Safety and Health Administration (OSHA) regulations
- Other design standards required by the Government

3.3.4.2.3 No requirement of this contract shall supersede applicable regulations, local codes and/or standards. Any violation of such regulations and standards shall be brought to the attention of the Government for clarification or direction prior to proceeding with the work.

3.3.4.2.4 Electrical Specification

Electrical power supply at 415 volts, 3 phase, 50 Hz, 4 wires shall be provided.

All Motors shall be designed specifically for operation on 50 Hz AC supply. Motors which have been designed for operation on 60 Hz, and then modified for operation on 50 Hz will not be accepted.

3.3.4.2.5 Roof Design – ESCO shall comply with thermal transmittance (U-Value) for roof ($\text{W/m}^2\text{K}$) not greater than that tabulated in Table 3.1.

Table 3.1: (Source: MS1525:2007)

Roof Weight Group	Maximum U-Value ($\text{W/m}^2\text{K}$)
Light (Under 50 kg/m^2)	0.4
Heavy (Above 50 kg/m^2)	0.6

- 3.3.4.2.6 Window Design – ESCO shall follow a guide for the design of windows in term of size, shape, position and orientation of windows based on intended purpose and requirement as per Table 3.2:

Table 3.2: (Source: MS1525:2007)

Purpose	Design recommendation
Daylighting	Optimum height and size for required daylight factor
Natural Ventilation	Orientation towards prevailing wind direction
Daylighting and view	Size and sill height suited to occupant position and external features
Daylighting and natural ventilation	Size and location must be suited to all parameters

3.3.5 As-Built Drawings

After completion of installation and the Government acceptance of installed ESM, ESCO shall submit as-built drawings to the Government in accordance with the Government's requirements.

3.3.6 Operation of ESM

- 3.3.6.1 Operations work effort for installed ESM shall include operations tasks at specific stations, continuous or periodic equipment monitoring, and minor on-line equipment adjustments required to achieve all facility and energy conservation performance. Regardless of who performs the operations, the ESCO shall be responsible for the operations of all installed ESM.
- 3.3.6.2 When the implementation of an installed ESM results in a change in an existing operations work procedure, the ESCO shall prepare a revised written operations work procedure and checklist for written acceptance by the Government. The ESCO shall train Government personnel in the operations work procedures.
- 3.3.6.3 The ESCO shall conduct periodic inspections with sufficient frequency to determine the Government's compliance with operations work procedures and notify the Government of any non-compliance and necessary corrective action.
- 3.3.6.4 The ESCO shall maintain adequate and necessary records from inspections, which will be made available during the monthly M&V review. These records will contain at a minimum the identification of ESM inspected, date of inspection, date of repair and/or replacement implemented, and description of activities performed and shall be included in the monthly report on ESM Performance (also known as M&V report).

3.3.7 Inspection of Installed ESM

- 3.3.7.1 Each ESM will include specific inspection criteria pertinent to the ESM. The following general inspection requirements shall apply to each ESM:
- (a) Inspections will be conducted by ESCO to verify ESM performance.

- (b) The ESCO shall notify the Government WITHIN fifteen (15) working days in advance of ESM installation completion (or such other notification period by submitting a written request for inspection). The request shall identify the location, describe the ESM installed, schedule testing of ESM for verifying energy savings performance, and recommend dates for inspection (if any).

3.3.8 Standards of Service and Comfort

- 3.3.8.1 The Government agrees to operate the conditioned spaces in the Facility within the ranges scheduled in the Table 3.3: Table of Comfort Level. Operating conditions outside the range specified in this table shall constitute a cause for adjustment under this Contract.
- 3.3.8.2 In the event that an adjustment is sought, the ESCO shall submit the proposed adjustments to the Government and describe the reasons for the adjustment.

Table 3.3: Table of Comfort Level

	Cooling Set-point	Relative Humidity	CO ₂ Level
Occupied	75°F ± 1°F,	55% ± 5%	≤ 1000 ppm
Unoccupied	Off	N/A	≤ 1000 ppm

- 3.3.8.3 The ESCO shall comply with the recommended illumination levels as shown in Table D.1 in Attachment D.

3.4 SPECIFICATIONS FOR MEASUREMENT AND VERIFICATION (M&V) OF ESM PERFORMANCE

3.4.1 General

- (a) Every ESM shall include a site-specific M&V plan that specifies the M&V requirements and procedures that shall apply to the ESM based on various factors, such as ESM, projected value of energy savings, certainty/uncertainty of savings being achieved, and the intended risk allocation between the Government and the ESCO.
- (b) The ESM M&V plan is the primary vehicle that the Government uses to first document and then to periodically evaluate the performance expectations of the ESM project. This document shall be thoroughly understood by the ESCO and the Government. It shall, in a clearly understandable format, state where and how energy and related cost savings are going to occur and how they are to be calculated and verified.
- (c) If the scope of work does not include the entirety of a site, or all the systems or significant portions within a building, then that situation shall be stated clearly so that the Government and the ESCO are aware of what the ESM covers and what it does not.
- (d) Each building and/or space within a building that will be affected shall be identified, and buildings or portions of buildings that will not be affected shall be identified. The ESM that generate savings shall be identified, as well as the building systems that they affect.
- (e) If there are significant energy using building systems or other energy uses within the buildings, which will not be affected by the ESM, they shall be identified so that there is clear understanding of the extent to which total energy and related costs at the site will be affected. To the extent this information is provided in the energy audit, it will be repeated in the M&V plan.
- (f) The description of facilities and systems affected by the ESM serves as the context for determining risks associated with the performance of the ESM and the likelihood of success in achieving projected savings.
- (g) The ESM M&V plan shall specify the M&V options and methods that will be used for each ESM. M&V options and methods proposed for each ESM shall comply with the latest version of the "International Performance Measurement and Verification Protocol" (IPMVP).

3.4.2 M&V Activities

The ESCO shall perform the following required M&V activities:

- (a) Define a site-specific M&V plan for the particular ESM being installed, once the project has been fully defined and the energy audit is completed.
- (b) Define pre-installation baseline including:
 - (i) equipment/systems,
 - (ii) baseline energy use,

- (iii) system performance factors (e.g., lighting levels, temperature setpoints, etc.), and/or
 - (iv) actions to determine baseline energy use, which may include site surveys, short-term or long-term metering, analysis of billing data, and/or engineering calculations.
- (c) The pre-installation baseline should also identify factors beyond the ESCO's control that influence post-installation energy (e.g., building occupancy, weather, plug load increment, etc.). Where such factors beyond the ESCO's control potentially exist, the Government and ESCO will agree on what measures should be taken to adjust the baseline, modify savings calculations or otherwise account for such factors.
- (d) Where feasible, adjustments to the calculation methodology for savings are to be preferred over changes to the baseline. Such adjustments make it easier to present the actual savings.
- (e) Define post-installation conditions including:
 - (i) equipment/systems,
 - (ii) post-installation energy use and/or
 - (iii) actions to determine post-installation energy use, which may include site surveys, short-term or long-term metering, analysis of billing data, and/or engineering calculations.
- (f) Conduct monthly M&V activities to verify operation of the installed equipment/systems and calculate the previous monthly energy savings. Comparison of the verified against the guaranteed savings shall be certified by ESCO's Energy Manager.

3.4.3 M&V Submissions

- (a) The ESCO shall prepare and submit a general M&V approach with its Preliminary Assessment (PA), identifying the M&V options and methods to determine a site-specific pre-installation baseline and post-installation ESM performance for each proposed ESM.
- (b) The ESCO shall prepare and submit a site-specific M&V plan with its final proposal. This site-specific M&V plan shall include a schedule indicating M&V activities and post-award M&V reporting milestones for each ESM. Prior to installation of ESM, measurements and calculations, records (e.g., utility bills) and other elements of the baseline, shall be reviewed by the Government to confirm its accuracy and to confirm that the methods are consistent with the approved M&V plan.
- (c) The ESCO shall prepare and submit a post-installation report to the Government, which should verify that installed ESM will meet the required standards of service and the guaranteed energy and related cost savings specified in the ESM.
- (d) The ESCO shall prepare and submit monthly M&V report to the Government, including data and calculations that demonstrate that continued ESM performance achieves the guaranteed energy and related cost savings as required from the ESM.

3.5 SPECIFICATIONS FOR TESTING & COMMISSIONING

The ESCO shall assure the Government, through the ESM Testing and Commissioning, that the ESM performance achieves facility and/or process performance requirements. The ESM Testing and Commissioning shall be accomplished through a process of verification and documentation.

(a) ESM Testing and Commissioning Approach

The ESCO shall submit in its final proposal, a severable ESM Testing and Commissioning Approach document, that utilizes data and factors derived from the energy audit, needed to achieve facility performance requirements.

(b) ESM Testing and Commissioning Plan

After the Government reviews and accepts the design and construction details, the ESCO shall provide a Testing and Commissioning Plan to the Government for acceptance that finalizes the Testing and Commissioning Approach and addresses each ESM with specific steps that will be taken during the commissioning process.

(c) ESM Testing and Commissioning Report

The ESCO shall submit to the Government a Testing and Commissioning Report documenting the ESM's affect upon facility performance requirements in accordance with the Testing and Commissioning Plan and Government's requirements.

3.6 SPECIFICATIONS FOR SERVICE AND MAINTENANCE**3.6.1 Preventive Maintenance of ESM**

- 3.6.1.1 Preventive maintenance work includes periodic equipment inspections, tests, calibrations, and preventive maintenance tasks and actions required to ensure that systems operate as intended. The ESCO shall be responsible for preventive maintenance of all installed ESM.
- 3.6.1.2 The ESCO shall prepare a written definition of preventive maintenance requirements and preventive maintenance work schedule, procedure and checklist for each installed ESM. The ESCO shall train Government personnel in the revised preventive maintenance work procedures.
- 3.6.1.3 The Government may assume performance of preventive maintenance through agreement of the ESCO and the Government. If the Government assumes preventive maintenance work, the equipment shall be maintained in accordance with the preventive maintenance work procedures and checklists provided by the ESCO and accepted by the Government. The ESCO shall conduct periodic inspections with sufficient frequency to determine Government compliance with preventive maintenance work procedures and notify the Government of any noncompliance and necessary corrective action.
- 3.6.1.4 The ESCO shall maintain adequate and necessary records from inspections, which will be made available during the monthly M&V review. These records will contain at a minimum the identification of ESM inspected, date of repair and/or replacement implemented, and description of activities performed and shall be included in the monthly report on ESM Performance (also known as M&V report).

3.6.2 Repair of ESM

- 3.6.2.1 The ESCO shall be responsible for the repair of all installed ESM.
- 3.6.2.2 Repair of ESM includes all material and equipment associated with the replacement or repairs of facilities, systems, or equipment that have failed or are in a condition of diminished ESM performance as determined by the ESCO, and concurred to by the Government.
- 3.6.2.3 Equipment Failure - if equipment failure or damage is a result of the ESCO's failure to perform or negligence in performing repairs, the ESCO shall provide repair or replacement at its expenses.
- 3.6.2.4 ESCO shall response to the Government's request for repair and shall carry out the repair, within the following time frame:
- (a) Emergency (where life and property are at stake) – immediate response and rectification time within three (3) hours
 - (b) Urgent (where there is a breakdown of services and systems) – response time within thirty (30) minutes and rectification time within twenty four (24) hours
 - (c) General (normal situation where none of the above occurs) – response time within one (1) hours and rectification time within three (3) days

3.6.4 Operations and Maintenance (O&M) Manuals

The ESCO shall furnish O&M manuals and recommended spare parts lists for O&M of the ESCO-installed ESM and modified Government equipment. O&M plans and spare parts lists shall be submitted prior to Government acceptance of the project.

ATTACHMENT D

Table D.1: Table of Recommended Illumination Levels (Source: CKE Buletin, 2009)

Item	Area	Illumination Level (Lux)
1	Ruang Laluan (Luar)	50
2	Tempat Letak Kereta	50
3	Bilik Tidur Hotel	100
4	Lif	100
5	Koridor	100
6	Tangga	100
7	Eskalator	150
8	Bilik Persalinan	100
9	Bilik Pencuci	100
10	Pintu keluar & Masuk	100
11	Dewan Masuk	100
12	Lobi	100
13	Bilik Menunggu	100
14	Kaunter Pertanyaan	300
15	Pejabat	300
16	Pejabat Lukisan	300
17	Restoran	150
18	Kantin	200
19	Kafeteria	200
20	Dapur	150
21	Bilik Mandi	150
22	Tandas	100
23	Bilik Darjah	300
24	Perpustakaan	500
25	Muzium	300
26	Bilik Komputer	500
27	Bilik Mesyuarat	300
28	Bilik Pengarah	300
29	Bilik Pegawai	300
30	Bilik Perbincangan	300
31	Stor	100
32	Bilik Cetak	300
33	Bilik Fail	300
34	Bilik Kuliah	300
35	Bilik Makmal	300
36	Bilik Utiliti	100
37	Dewan Serbaguna	300
38	Surau	300
39	Bilik Solat	300
40	Ruang Wuduk	150
41	Bilik Seminar	300
42	Bilik Tukar Lampin	200
43	Bilik Penyusuan	300
44	Bilik Rawatan	300
45	Bilik Pemeriksaan	300

46	Bilik Analisa	300
47	Farmasi	300
48	Bilik Kebal	300
49	Bilik Pergigian	300
50	Bilik Sterilisasi	300
51	Bilik Pembedahan	500
52	Bengkel	500
53	Ruang Laluan (Dalam)	300
54	Auditorium	150
55	Gimnasium	300
56	Garaj	300
57	Bilik Demonstrasi Memasak	100
58	Pantri	100
59	Bilik Penyediaan Makanan	300
60	Bilik Suis/Riser	150
61	Bilik Set Janakuasa	150
62	Bilik Server	300
63	Bilik Mesin	300
64	Bilik AHU	150
65	Bilik MDF	150
66	Rumah Pam	150
67	Bilik Motor Lif	150
68	Bilik Tangki / Mekanikal	150
69	Bilik Tayangan	300
70	Bilik Studio Rakaman	300
71	Bilik Prosedur	300
72	Bilik Gelap	300
73	Bilik Cuci/Dobi	200
74	Hangar	500

SECTION 4: SCHEDULE OF TECHNICAL DATA & EQUIPMENT OFFERED

4.1 MEASUREMENT AND VERIFICATION PLAN AND SAVINGS CALCULATION METHODS OUTLINE

[As per description and example in Attachment E.]

4.2 AGREED BASELINE VALUE

[Attach historical utility energy bills for twenty-four (24) months and calculation for establishing agreed baseline value as per description and example in Attachment F.]

- 4.2.1 Works consist of Energy Saving Measure to be provided in lump sum in _____ (building location).
- 4.2.2 ESCO shall be responsible to guarantee that the minimum energy saving (Guaranteed Savings) of ____% from Agreed Baseline Value (ABV) is achieved. For the purpose of this Contract, ABV has been determined as energy consumption at _____ kWh per month.
- 4.2.3 Savings (P) is defined as amount of savings achieved after AND in addition to Guaranteed Savings.
- 4.2.4 The ABV is only limited to energy consumptions (in kWh) and excludes Maximum Demand (in kW).
- 4.2.5 ESCO shall convert the thermal energy (in RTh) to electrical energy (in kWh) by using Coefficient of Performance (COP) obtained from service provider to determine the Agreed Baseline Value (if applicable).

4.3 PAYMENT AND SAVINGS-SHARING SCHEDULE

[Attach schedule to indicate payment and ratio of sharing of savings in utility energy bill for the contract period.]

- 4.3.1 Payment amount to ESCO is dependent on the savings-sharing ratio at ____%:____% (ESCO:Government) after Guaranteed Saving at ____% is deducted.
- 4.3.2 Payment can be carried out after the Government receives monthly M&V report from ESCO which has been certified by ESCO's Professional Engineer / Architect / Registered Electrical Energy Manager.

4.4 DETAILED ENERGY AUDIT REPORT

[Attach the detailed energy audit report.]

E1.3 Table 3 - M&V Plan Summary

ESM No.	ESM Description	M&V Option	Summary of M&V Plan

Measurement Options

There are four approaches to measuring savings that are termed “Option A, B, C and D. These are the cornerstones of the standardized set of procedures contained in the IPMVP. This group of options can be divided in to two main categories.

Options A and B (Isolation Retrofit Approach)

Options A and B focus on the performance of specific ESM such as items of equipment and installed retrofits that can be measured in isolation from the rest of the building. Before and after measurements are taken and compared to determine the savings.

Options C and D (Whole Building Approach)

These options are used when the nature of the ESM is not easily measured in isolation from the rest of building operations. These could be typical of operational and control changes that affect many areas of the building. The Option C approach assesses saving at the whole-facility level by analyzing utility bills before and after the implementation of the ESM's. Option D uses computer simulations and modeling of the whole facility, usually when base year energy data is not available or reliable.

E2 PROJECT DATA ASSUMPTIONS**E2.1 Energy and O&M Rate Data**

- A. Detail baseline energy rates.
- B. Provide post-acceptance performance period rate adjustment factors for energy and O&M cost savings, if applicable.

E2.2 Schedule and Reporting for Verification Activities

- A. Define requirements for measurements during :
 - I. Baseline development
 - II. Post-installation verification activities
 - III. Post-acceptance performance period

B. Table 4 - Schedule of Verification Reporting Activities

Item	Recommended time of submission	Review and acceptance period
Post-Installation Report	30 days after acceptance	30 days
Monthly Report	30 days after monthly performance period	30 days

E2.3 O&M Reporting Requirements

Define ESCO reporting requirements:

- A.** Summarize key verification activities and reporting responsibilities of ESCO on operations and maintenance items from details in ESM specific M&V Plans.
- B.** Define content of reports and reporting schedule.

E2.4 Dispute Resolution

Describe plan for resolving disputes regarding issues such as baseline, baseline adjustment, energy savings calculation, and the use of periodic measurements.

E3 ESM-Specific M&V Plan and Savings Calculation Methods

Develop the following sections for each ESM.

E3.1 Overview of ESM, M&V Plan and Savings Calculation for ESM

- A.** Summarize the scope of work, location, and how cost savings are generated. Describe source of all savings including energy, O&M, and other (if applicable).
- B.** Specify the M&V guideline and option used from the M&V Guidelines: Measurement and Verification for the current version of the International Performance Measurement and Verification Protocol (IPMVP).
- C.** Provide an overview of M&V Activities for ESM. Explain intent of M&V plan, including what is being verified.
- D.** Provide an overview of savings calculations methods for ESM. Provide a general description of analysis methods used for savings calculations.

E3.2 Energy Baseline Development

Describe in general terms how the baseline for this ESM is defined.

- A.** Describe variables affecting baseline energy use.
 - I.** Include variables such as weather, operating hours, set point changes, etc.
 - II.** Describe how each variable will be quantified, i.e., measurements, monitoring, assumptions, manufacturer data, maintenance logs, engineering resources, etc.
- B.** Define key system performance factors characterizing the baseline conditions. Include factors such as comfort conditions, lighting intensities, temperature set points, etc.
- C.** Define requirements for measurements if different than whole project data requirements.

- D.** Provide details of baseline data collected, including:
- I. Parameters monitored
 - II. Details of equipment monitored, i.e., location, type, model, quantity, etc.
 - III. Sampling plan, including details of usage groups and sample sizes
 - IV. Duration, frequency, interval, and seasonal or other requirements of measurements
 - V. Personnel, dates, and times of measurements
 - VI. Proof of Government witnessing of measurements (if required)
 - VII. Monitoring equipment used
 - VIII. Installation requirements for monitoring equipments (test plug for temperature sensors, straight pipe for flow measurement etc.)
 - IX. Certification of calibration/calibration procedures followed
 - X. Expected accuracy of measurements/monitoring equipment
 - XI. Quality control procedures used
 - XII. Form of data to be collected (excel or other compatible spreadsheet software)
 - XIII. Results of measurements (attach appendix and electronic format as necessary)
 - XIV. Completed data collection forms, if used
- E.** Provide details of baseline data analysis performed, including:
- I. Analysis using results of measurements
 - II. Weather data used and source of data

E3.3 Proposed Energy Savings Calculations and Methodology

- A.** Provide detail description of analysis methodology used. Describe any data manipulation or analysis that was conducted prior to applying savings calculations.
- B.** Detail all assumptions and sources of data, including all stipulated values used in calculations.
- C.** Include equations and technical details of all calculations made. (Use appendix and electronic format as necessary.) Include description of data format (headings, units, etc.).
- D.** Details of any savings or baseline adjustments that may be required.
- E.** Detail energy rates used to calculate cost savings. Provide post-acceptance performance period energy rate adjustment factors.
- F.** Detail proposed savings for this energy saving measure for post-acceptance performance period.

E3.4 Operations and Maintenance Cost Savings

- A.** Provide justification for O&M cost savings.
- I. Describe how savings are generated
 - II. Detail cost savings calculations.

- B. Provide post-acceptance performance period other cost savings adjustment factors.

E3.5 Details of other savings (if applicable)

- A. Provide justification for cost savings.
 - I. Describe how savings are generated.
 - II. Detail cost savings calculations.
- B. Provide post-acceptance performance period other cost savings adjustment factors.

E3.6 Post-Installation M&V Activities

Describe the intent of post-installation verification activities, including what will be verified.

- A. Describe variables affecting post-installation energy use.
 - I. Include variables such as weather, operating hours, set point changes, etc.
 - II. Describe how each variable will be quantified, i.e., measurements, monitoring, assumptions, manufacturer's data, maintenance logs, engineering resources, etc.
- B. Define key system performance factors characterizing the post-installation conditions such as lighting intensities, temperature set points, etc.
- C. Define requirements for measurements if different than whole project data requirements.
- D. Provide details of post-installation data to be collected, including:
 - I. Parameters to be monitored
 - II. Details of equipment to be monitored (location, type, model, quantity, etc.)
 - III. Sampling plan, including details of usage groups and sample sizes
 - IV. Duration, frequency, interval, and seasonal or other requirements of measurements
 - V. Monitoring equipment to be used
 - VI. Installation requirements for monitoring equipment
 - VII. Calibration requirements/procedures
 - VIII. Expected accuracy of measurements/monitoring equipment
 - X. Quality control procedures to be used
 - IX. Form of data to be collected (excel or other compatible spreadsheet software)
 - XI. Sample data collection forms (optional)
- E. Detail data analysis to be performed.

E3.7 Post-Acceptance Performance Period Verification Activities

- A. Describe variables affecting post-acceptance performance period energy use.

- I. Include variables such as weather, operating hours, set point changes, etc.
- II. Describe how each variable will be quantified, i.e., measurements, monitoring, assumptions, manufacturer data, maintenance logs, engineering resources, etc.
- B.** Define key system performance factors characterizing the post-acceptance performance period conditions. Include factors such as comfort conditions, lighting intensities, temperature set points, etc.
- C.** Describe the intent of post-acceptance performance period verification activities – what will be verified.
- D.** Provide detailed schedule of post-acceptance performance period verification activities and inspections.
- E.** Define requirements for Government witnessing of measurements if different than whole project data requirements.
- F.** Provide details of post-acceptance performance period data to be collected, including:
 - I. Parameters to be monitored
 - II. Details of equipment to be monitored (location, type, model, quantity, etc.)
 - III. Sampling plan, including details of usage groups and sample sizes
 - IV. Duration, frequency, interval, and seasonal or other requirements of measurements
 - V. Monitoring equipment to be used
 - VI. Installation requirements for monitoring equipment
 - VII. Calibration requirements/procedures
 - VIII. Expected accuracy of measurements/monitoring equipment
 - X. Quality control procedures to be used
 - IX. Form of data to be collected (excel or other compatible spreadsheet software)
 - XI. Sample data collection forms (optional)
- G.** Detail data analysis to be performed.
- H.** Define O&M and repair reporting requirements.
 - I. Detail verification activities and reporting responsibilities of agency and ESCO on operations and maintenance items.
 - II. Define reporting schedule.

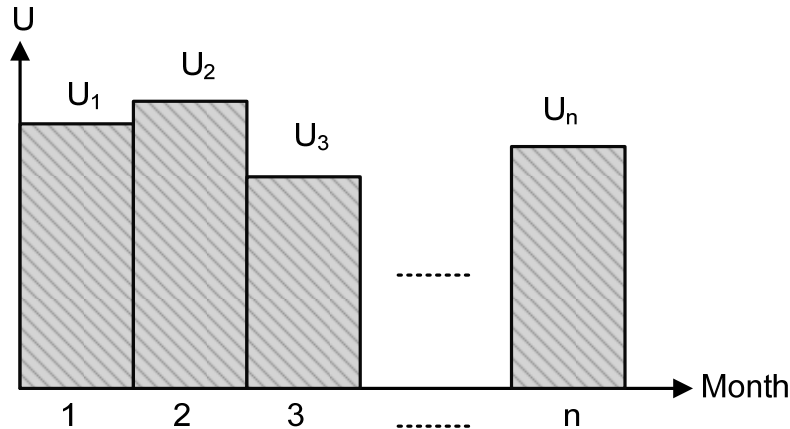
ATTACHMENT F

BASELINE DETERMINATION AND SAVINGS-SHARING CALCULATION METHODS OUTLINE AND EXAMPLE

F1 AVERAGE VALUE OF HISTORICAL ENERGY BILLS

Average value of historical energy bills before ESM, U_{avg} , (in kWh / month) is calculated for 24 months as followings:

$$U_{avg} = \frac{U_1 + U_2 + U_3 + \dots + U_{24}}{24}$$



Example: $U_{avg} = (1000 + 900 + 800 + \dots + 800) / 24 = 800 \text{ kWh / month}$

F2 AGREED BASELINE VALUE

Agreed Baseline Value, ABV , is established as:

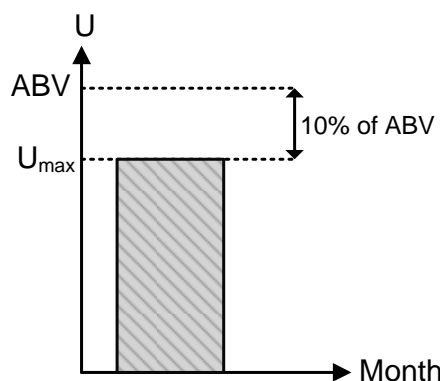
$$ABV = U_{avg}$$

Example: $ABV = 800 \text{ kWh / month}$

F3 GUARANTEED SAVINGS

If 10% is set as Guaranteed Savings in energy bill for the Government, therefore, maximum value of energy bill after ESM completion, U_{max} , is

$$U_{max} = ABV - (10\% \text{ of } ABV) = ABV - (0.1 \times ABV) = 0.9 \times ABV$$

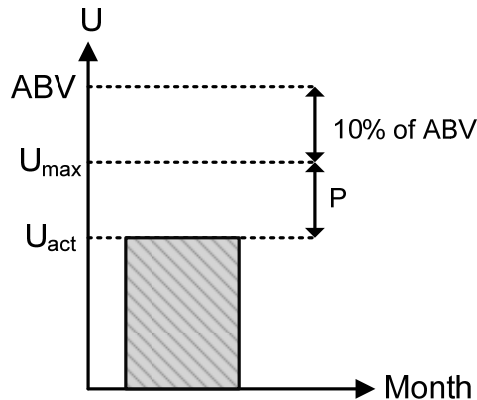


Example: $U_{max} = 800 - (0.1 \times 800) = 720 \text{ kWh / month}$

F4 SAVINGS

Savings, P , is defined as margin of savings in energy bill after AND in addition to the Guaranteed Savings. With actual energy bill after ESM completion at U_{act} , P is calculated as follows:

$$P = U_{max} - U_{act}$$



Example: If actual energy bill for 1st month after ESM completion is 650 kWh, then

$$P = 720 - 650 = 70 \text{ kWh for 1}^{st} \text{ month}$$

F5 SAVINGS-SHARING RATIO

Savings-sharing ratio between ESCO and the Government is to be set and agreed by both parties, for example, 80%:20% (ESCO:Government).

F6 COMPENSATION FOR SHORTFALL IN GUARANTEED SAVINGS

If actual energy bill after ESM completion, U_{act} , exceeds the maximum value, U_{max} , ESCO shall compensate the Government. The compensation value, C , is:

$$C = U_{act} - U_{max}$$

