

REPUBLIC OF TURKEY  
MINISTRY OF ENVIRONMENT AND URBANIZATION  
General Directorate of Construction Affairs

TURKEY ENERGY EFFICIENCY IN PUBLIC BUILDINGS PROJECT  
(P162762)

**TERMS OF REFERENCE (TOR) FOR  
CONSULTING SERVICES ON THE SUPERVISION AND COMMISSIONING FOR ENERGY EFFICIENCY  
BUILDING RENOVATIONS  
(REF: EEPB/WB/MoEU/QCBS-DES&SUP-06)**

**I. Introduction**

The Ministry of Environment and Urbanization (MoEU) has received for financing from the World Bank toward the cost of the Energy Efficiency in Public Buildings Project (EEPBP) and intends to apply part of the proceeds for consulting services.

The project investments will focus primarily on the renovation of central public buildings with high energy consumption and shorter pay-back periods. The proposed project would be implemented through two components: (i) energy efficiency (EE) investments in central government buildings; and (ii) technical assistance (TA) and project implementation support. The General Directorate of Construction Affairs (GDCA) under the MoEU has been delegated to assume overall responsibility for the project. This will include completion of the necessary activities to support project preparation as well as implementation for the six-year project period. In parallel, grant funding has been mobilized from the Clean Technology Fund (CTF) to help analyze the investment needs and potential of the central government buildings.

The GDCA has established a project implementation unit (PIU) to administer all aspects of the project, including selection of the buildings, procurement of the various contractors (e.g. energy audits, technical designs, renovation works, construction supervision, savings verifications, technical assistance or consultancies, etc.), and monitoring.

Through the EEPBP, approximately 500-700 public buildings will be renovated for EE. Investments would include building envelope measures (roofs/wall insulation, windows, doors), heating/cooling systems, water heating, pumps/fans and lighting and some renewable energy (RE) applications (e.g., rooftop solar PV, biomass heating, solar water heating, geothermal heat pumps) to offset the building's electricity/fuel use. A limited amount of funds may be allocated for non-EE/RE measures (e.g., rewiring, minor structural repairs, painting, seismic safety, etc.).

Within the framework of the EEPBP, a consulting firm will be employed to carry out construction supervision and building commissioning.

**II. Scope of Services**

The Consultant will be required to carry out construction supervision and building commissioning services, supervise remedial works to rectify defects that arise during the Defects Notification Period (DNP), and prepare Measurement and Verification (M&V) reports for the renovated buildings.

Estimated total area of buildings for renovation in 1 campus is 289.068 mt<sup>2</sup>, having 24 separate building blocks. It should be noted that slight changes may occur in the list in number of buildings or locations.

The campus and its location is listed below:

LIST OF BUILDINGS- DES&SUP-06						
	NAME OF CAMPUS	RELATED INSTITUTION	CITY	TOTAL AREA m2	ENERGY AUDIT	No. blocks
1	Pamukkale Üniversitesi	Pamukkale Üniversitesi	DENİZLİ	289.068m <sup>2</sup>	11 blocks (84.843m <sup>2</sup> ) have no existing audit, 13 blocks (204224 m <sup>2</sup> ) have audits)	24

### III. Description of the Consultants's Tasks

#### *Principles of consultant assignment*

- The Consultant as "the Engineer" shall also be responsible to carry out all the duties envisaged in the Contractor's contract document. The Consultants shall perform all duties which may be required to do pursuant to any Contract entered into between the Client (designated as "the Employer") and the Contractor where Consultants are designated as "the Engineer" in such Contract.
- The Consultant shall provide consulting services for execution of works with qualified personnel approved by Client.
- The Consultant shall execute the services in accordance with recent laws and regulations,
- The Consultant shall supervise and oversee all aspects of the construction and installation of the various components of the works and engineering services to ensure strict compliance with the drawings and contract documents, subject to any expressed or implied terms contained in the Contract entered into between the Client and the Contractor,
- The Consultant shall stipulate the criteria, the planning and the procedure for all tests and inspections necessary for the materials, equipment, plant and workmanship and the commissioning of the Works and shall provide supervision and inspection for these tests. The Consultant shall compile a record of all such tests and compare the results with the specifications, standards or with the performance criteria that has been guaranteed by the suppliers or contractors,
- Consultant shall follow up evacuation of buildings (if needed) with respect to the planned schedule of the works, communicate with the related authorities and inform the Client timely on the issues identified,
- The Consultant shall collect and/or prepare the necessary documents required for obtaining the renovation construction permit (if needed) from the Municipality shall also sign the documents to be submitted for the official permits and assist the Contractors for obtaining the renovation construction permit (if needed),
- The Consultant shall arrange weekly and monthly meetings with contractors, inform the Client about progress of the work and activities, attend any meetings reasonably convened by the

Client and provide any information or evidence reasonably required by the Client at any public meetings or inquiries which might be held in connection with the Project,

- It is the duty of the Consultants to interpret the drawings and specifications and to consult with the Contractors as required to ensure compliance with the Contract and the work programme.
- The Consultant shall check the Contractor's valuations for payment on account and issue certificates according to the Conditions of Contract used and shall also be responsible for agreeing with the Client on each payment certificates in payable amount. The actual procedure and presentation of the certificates, supporting documents, etc. shall be discussed and agreed with the Client,
- The Consultant shall review and report on any financial claims submitted by the Contractors within 2 weeks of receipt of such claim submission. Report on any claim shall include (not limited to) determinations, the justification letter, cost-benefit analysis, all probable effects on approved work plan and the final decision on any variation.
- If payment certificate is not prepared by contractor, consultant will prepare payment certificate for contractor,
- The Consultant shall have a quality review of the designs, plans, technical specifications, BOQs, etc. that were originally prepared during the first phase design services contract and prepare any additional documents and detailed designs (if needed) that would minimize variation orders during the construction/installation stage. However, in case it is considered necessary by the Consultant or the Client that any alterations in any of the Contract Documents, Plans or Specifications are advisable (due to reasons not attributable to the works contractor), the Consultant shall prepare and submit such alterations to the Client for approval, in a timely manner, supported by the necessary calculations, details and, time and cost implications. The Consultant shall state whether the alterations will cause any delay in the work program, and therefore the contractor(s) to be entitled any time extension or not, supported by necessary documentation. On receiving written approval from the Client, the Consultant shall promptly amend the existing designs or supply any additional designs, plans, drawings and specifications where required or found necessary for the satisfactory completion of the works. Furthermore, the Consultant shall review and approve Contractor's and manufacturer's drawings and where appropriate incorporate these drawings into the overall design and review alterations which might be requested by the Contractors during the course of Works. The Consultant shall fully inform the Client about the cost and time impact and any other consequences of his any sort of proposals (such as revisions, recommendations, etc). The Client shall not be responsible from the consequences of the fact of which the Client is not informed in advance,
- The Consultant shall not delay any action required to be taken by the Consultant during the construction. In any case, all the correspondences received from the contractor shall be reviewed, evaluated and responded the latest within one week. Any claim from the contractor(s) under the construction contracts shall be evaluated by the Consultant and necessary recommendation shall be made the latest within two weeks, as well,
- Some of the works may be executed by the Contractor in night hours rather than daily hours because of the sustainability of services in buildings or any other reasons. In that case, Consultant will arrange his staff employment according to this condition without any extra cost to the Client and the Contractor.
- The Consultant shall take necessary measures for environmental and safety aspects. In this context the most recent Turkish environmental and safety regulations are required to be taken into consideration particularly during the supervision of the construction works. Within this scope Consultant shall also be responsible for the supervision of the Contractors' onsite environmental management practices (waste management, noise, etc.) and report to the Client

in his monthly progress reports. The details of the Environmental Management and the responsibilities of the “Engineer/Project Manager” shall also be detailed in the Contractor’s contract. Consultant shall have the responsibility for relevant supervision and instruction of the applications to the Contractor.

- The Consultant shall assist in the setting of all disputes or differences, which may arise between the Client and the Contractors, in a timely manner. In the case of litigation and arbitration the Consultant shall assist the Client in the preparation of the documents needed by the Client,
- Since the similar construction works will also be supervised by other Consultant in other sites, the Consultant shall co-operate with the other Consultant and join the meetings whenever required by the Client,
- Awarded consultants and their nominated sub-consultants (if applicable) shall have a local branch office in Ankara for the administrative communication aspects (corresponding letters, printing or plotting of project document, etc.).

Not limited to the above, the specific tasks are described as follows:

***Task 1: Carry out construction supervision and building commissioning services***

This task is estimated to last about 8 months, from the time of signing the contract and work commencement notice letter with the construction contractor until completion of the renovations works by taking over certificate.

**1a) Supervise construction projects:**

- Oversee all phases of the project and contract and sign payment parts as specified on contract.
- Conduct regular (semi-monthly or more often if required) site visits of each construction site.
- Prepare semi-monthly progress reports and send a copy of material acceptance to the construction company and PIU.
- Administer contracts; evaluate schedules; monitor progress of the contractors on projects; ensure that project deadlines are met; proactively identify renovation challenges and propose solutions; ensure installation and renovation works follow design specifications and good practices for EE renovations.
- The Consultant, shall ensure the construction progress is in compliance with the workplan, building access plan, and restrictions (for access to users during the construction phase).
- The Consultant shall check the Contractor’s valuations (including measurements) for payment on account and issue certificates according to the Conditions of Contract used and shall also be responsible for agreeing with the Client on each payment certificates in payable amount. The actual procedure and presentation of the certificates, supporting documents, etc. shall be discussed and agreed with the Client.
- Oversee implementation of the Environmental and Social Management Plans (ESMPs), including supervision regarding proper removal, packaging, and transport and disposal/interim storage of the hazardous materials, use of personal safety equipment, and monitoring in line with requirements of design and Environmental Mitigation and Monitoring Measures based on the Environmental and Social Management Framework.
- Ensure that all health & safety measures are respected by the construction company in compliance with the monitoring and reporting requirements of relevant official authorities and the World Bank.

**1b) Evaluate the completion and implement commissioning of the construction projects until Taking-over Stage**

- Confirm the projects' compliance with the investment plan. In case of deviation from those plans, justification of the differences and evaluation of consequences in terms of compliance of the project with the eligibility criteria of the facility.
- Before issuing the Taking-Over Certificate, the Consultant will enforce any obligation placed on the construction contractor to remove all obstructions, surplus materials, plant, wreckage, rubbish and temporary works.
- Upon completion of the works, the Consultant will require the construction contractor to remove all plant, equipment and materials except those required to complete any outstanding or remedial works and facilities required by the Consultant during the Defects Notification Period.
- The Taking-over certificate shall be prepared and issued by the Consultant in consultation with the Client, following the successful completion of the works provided that the Consultant is satisfied that any defects or deficiencies have been successfully rectified.
- The Consultant shall oversee training of O&M staff on new equipment. The issuance of the Taking-over Certificate shall be subjected to:
  - ✓ The Contractor having provided the operating and maintenance manuals, training of O&M staff on new equipment, as well as all the drawings and documents handed over to the Client requested in the contract.
  - ✓ No major deficiencies are found and minor deficiencies are listed in the defects list by the Consultant.
- The Consultant shall witness the works performance tests carried out after completion and will analyze, evaluate and approve the final performance tests with the concurrence of the Client. The analyses, results and conclusions with recommendations shall be compiled in the project completion report to be submitted to the PIU.
- Prepare Energy Performance Certificate (EKB): The consultant shall prepare the energy performance certificate of the building before and after the completion of the works with the BEP-TR program.

**Deliverables**

- **1a) Interim semi-monthly progress reports for works contract.** These will describe the physical and financial progress of the works and will address contractual and technical matters. They shall provide information on (tentative list below that can be amended):
  - (i) a description of physical progress, with reference to the program (including progress charts and dated photographs in color giving all information regarding the progress of the Works);
  - (ii) explanations for differences between actual and forecast progress;
  - (iii) a summary financial report containing cash-flow forecasts and budget expenditure;
  - (iv) status of payments and requests for payment;
  - (v) explanations for differences between actual and forecast cash-flow o summary of claims and disputes;
  - (vi) major milestones, obstacles, achievements, constraints on progress and problems encountered and appropriate identified solutions;
  - (vii) remarks on procedural issues;
  - (viii) variations and proposals for future variations to the timing and budgets of individual activities;

- (ix) a projection of activities for the forthcoming month;
- (x) recommendation for further actions and improvements, both short- and long-term;
- (xi) records of human resources, mechanical equipment and materials, testing and quality control, with copies of the test results and, statistical evaluation of the test results in table or graphical form. Action taken with regard to poor results shall be stated;
- (xii) local issues/stakeholder issues;
- (xiii) a summary of environmental issues, including compliance with the ESMP.
- (xiv) The report shall include the percentages of the Work items completed and planned, and also the actual and planned cash-flows for each work item as of the reporting period prepared in the project planning tools (such as Primavera, Asta, etc) accepted by the client.

The report shall be submitted to the Client by the fifth day of following month. Any comment by the Client on the report shall be reviewed and re-submitted to the Client within a week.

In addition, the Consultant have to record views from at least 5 points for each building, on weekly base, showing the progress on the site with dates and record them with acceptable format on usb storage and submit to the Client.

Consultants shall also prepare a report in table form showing summary of cumulative progress in main work activities on weekly basis. The report shall be submitted to the Client in an acceptable format by the Monday of each week via electronic mail.

- **1b) Draft project completion report**, to be delivered 4 weeks prior to completion of the contract period. These will provide an overview and measure of success of the project. They shall contain: (i) a summary of information contained in the previous monthly reports; (ii) an overall review of the project; (iii) a description of physical progress, with reference to the program; (iv) explanations for differences between actual and forecast progress; (v) a summary financial report containing cash-flow forecasts and budget expenditure; (vi) the status of payments and requests for payment; (vii) explanations for differences between actual and forecast cash-flow on summary of claims and disputes; (viii) an assessment of impact of project on the number of people employed; (ix) a report on problems encountered and how they were overcome; (x) recommendations for maintenance works; (xi) report on the compliance with ESMPs. The Consultant shall review and approve in consultation with the Client the relevant completion reports with enclosed test results for the particular work sections submitted by the Contractor. These reports shall address all Tests on Completion and Tests after Completion including their results. The approval of the completion reports shall be a pre-condition for issue of any Taking-over Certificate and Tests after Completion.
- **Final inspection report.** The final inspection report of the Consultant shall address the status of the work items at the time of Taking-over by the Client. The minor outstanding works, defects, failures, shortcomings are to be listed and compiled. Possible remedial actions by the Contractor as needed, are to be listed and noted, including the given period of time the Contractor is to rectify. The material handed over by the Contractor to the Client will be checked and listed for status and completeness
- **Final completion report**, to be delivered 2 weeks after completion of the contract period or after comments on the draft project completion report provided by the Client. The contents will be as for the draft completion report, with the incorporation of comments/suggestions from the reviewing parties. The report shall contain at least: (i) Copies of requests for issuance of a takeover certificate; (ii) A list of approved As-Built

Design submitted by the Contractor showing all the modifications in relation to the Main design elements or surveyor of performed works; (iii) Quality assessment of materials and workmanship; (iv) Data on the technical difficulties encountered and how they were solved; (v) Comment on the As-Built Design, (vi) List of Instructions for Use and Maintenance, (vi) Final Report on Contractor's ESHS performance (Code of conduct, compliance with ESMP, consent/permits and other relevant project requirements. Deliver to the Client upon completion of the works all job records, reproducible "as-built" drawings including (but not limited to) calculations, drawings, specifications, test reports and final cost analysis and the instruction necessary for the satisfactory operation and maintenance of the works.

- **Energy Performance Certificate (EKB)** for each building after completion of the renovation works
- **Other reports upon request.** The PIU may request the Consultant to submit specific reports on the issues related to the execution of the works. The Consultant will make the requested report in such manner within a reasonable time. The Consultant is obliged to provide all assistance to the PIU, upon request, in drawing up reports to the bodies that comprise the institutional framework for project implementation described in the introduction to this project task, relating to project implementation reports, financial reports and etc.

### ***Task 2: Supervise remedial works to rectify defects that arise during the Defects Notification Period (DNP)***

The Defects Notification Period (DNP) is 12 months, starting on the date of building commissioning.

- The Consultant shall continue to be responsible for the supervision and inspection of the construction and completion of the Works during the DNP as defined in the works contracts. The level of supervision shall be appropriate to the scale of the works being carried out. The Consultant will provide adequate number of technical staff acceptable to the Client on each construction site during the DNP. These inspections and supervision are to ensure that works, agreed to be carried out during the DNP, are properly carried out and have been completed and that any failure of any part of the Works has been rectified. If any defect is discovered, during this period, the Consultant shall promptly investigate the reason for it, report to the Client and take required actions to rectify the defect. A report of these inspections shall be submitted to the Client, which shall include all details of any defects, faults, accidents or breakdowns, which have occurred together with the estimated costs of repair and the time scales within which they will be completed.
- The Consultant will provide minimum number of technical staff acceptable to the Client on each construction site during the Defects Notification Period. Defects are expected to be minimum for a competent Consultant Firm during defects liability period. Therefore, consultant should consider minimum number of staff assigned in DLP consisting of technicians.
- Preparation and submission of as-built drawings, shop drawings, operating and maintenance manuals for all items of equipment and plants incorporated in or associated with the works, shall be controlled and followed by the Consultant in timely manner. As-built drawings, operating and maintenance manuals should be obtained from the Contractor during the issuing of taking-over certificate. Otherwise, the Client might ask the Consultant for the conversion of the approved shop drawings into as-built drawings if Client considers that the Consultant is not strictly following up the work. The Consultant shall also prepare and submit to the Client's approval a report giving all information about the "as-built-conditions" including (but not limited to) calculations, drawings, specifications, test reports and final cost analysis.

## Deliverables

- **DNP quarterly reports.** A report of the DNP inspections shall be submitted to the Client, which shall include all details of any defects, faults, accidents or breakdowns, which have occurred together with the estimated costs of repair and the time scales within which they will be completed. The reports shall be prepared on a quarterly basis.
- **DNP final report** shall be submitted by the time of the expiration of the DNP giving full details of all works carried out during the period. This report shall be submitted by the Consultant to the Client at least 30 days prior to issuing the Defects Notification Certificate for the completed Works.

### **Task 3: Preparation of Measurement and Verification (M&V) report**

The M&V period covers 12 months, starting on the date of building commissioning.

- Conduct required measurements to prepare the M&V Report. Measurement and verification of savings will be made in accordance with TS ISO 50.006 and IPMVP Option C (full facility renovation) the consultant should compare the baseline and final energy bills and adjust for degree days (HDD and CDD), changes in operating use, changes in energy prices, occupancy rates, etc.
- Prepare M&V reports for all buildings renovated in Year 1 of the Project one year after the renovation works are completed. The M&V reports need to be consistent with the format to be published by MENR. The PIU will review and approve the M&V report or request from the contractor to revise the report. The M&V report shall demonstrate the amount of savings realized by comparing the actual energy consumption with the reference energy consumption in which the necessary adjustments are made according to the TS ISO 50.006 standard will be calculated.

## Deliverables

- **M&V reports for all buildings renovated in Year 1 of the Project**

## IV. Deliverables

All Documents need to be in Turkish language. The first 5 M&V reports also need to be delivered in English language. All deliverables must be submitted as Hard Copy (in one copy signed and stamped) and soft copy.

The deliverables for each task will be submitted to and approved by the PIU. The consulting firm must obtain approval for each deliverable before moving to subsequent tasks. The table below summarizes the deliverables and includes an indicative timeline and payment schedule.

Task	Deliverable	Submission (months after contract signing)	
1	1a	Interim semi-monthly progress reports for works contract	Together with the submission of the interim payment certificate for each month
	1b	Final inspection report; final completion report; Energy Performance Certificates (EKB); As-Built drawings (including calculations, drawings, specifications, test reports and final cost analysis); Other reports as requested related to the completion of the works (Taking-Over stage)	At the time of drafting the taking-over report, 2 weeks after taking over, as agreed with the client



2		DNP Quarterly Reports and DNP Final Report	Quarterly, at the time of drafting DNP Certificate
3		M&V Report	At the time of submitting the DNP Report

#### **V. Facilities provided by the consultant**

The Consultant shall provide sufficient, qualified and experienced staff to ensure proper site supervision of the works and engineering services both during the construction and defects notification period including M&V works and ensure that the works are executed in accordance with recent regulations and rules. All costs for equipment and administrative and logistic support must be covered by the Consultant and included in the bid price, including:

- All costs arising from the activities of its staff during the contract period, including accommodation, allowances, transportation, insurance, etc.
- Automotive, equipment, office supplies and hardware and software to ensure that the monitoring is fully functional;
- All communication costs, including fax, email, telephone, etc.
- All the equipment, instruments, services and logistical support required for the implementation of the contract, and any costs incurred during its preparation of documents and drafts, copying, printing, etc.
- Technical equipment at the monitoring site;
- Other equipment, instruments, services and logistical support necessary for the implementation of the contract.
- Excellent written and spoken English and Turkish is required. If the Consultant will require a translation services, it will be at his own expenses and the Consultant will be responsible for the accuracy of the translation.
- The Consultant is required to obtain all the necessary permits, approvals, payment of all fees and contributions, as well as all the other elements necessary for the work of his professional staff who is engaged at his own expense for the performance of this Contract.

#### **VI. Timeline**

The estimated time period for this assignment will be held within the fourth quarter of 2020 and finalised in twenty (20) months period (8 months for construction and 12 months for Defects Notification Period), subject to completion of the construction contract.

During the supervision periods, it should be noted by the Consultant that any schedule, report, specification and other document submitted to the Client for approval will be reviewed by the Client and approved or returned for revision and/or resubmission in 15 calendar days.

The Consultant shall submit all the documents in a timely manner to complete the services on time without any delay. Time schedule for the completion of the consultants' services for the various parts of the work as mentioned below shall be submitted to the Client.

During the execution of the Services, the Client and the Consultant shall review the Work Plan and Staffing Schedule of the Consultant for every month. If required, Consultant shall update them requesting the official approval of Client.

#### **VII. Variations In Scope**

- The commencement dates of renovation works in each building may vary due to the unexpected reasons. The Consultants shall wait for the finalization of the tender evaluation or other issues to

be concluded in order to start up the construction works and shall not request any payment or compensation.

- If the relevant Construction Contract is not tendered or is not awarded by the Client, the Client may decide:

- i. to cancel the remaining services of the Consultants. The remaining payments will not be done to the Consultants and the Consultants shall not request any payment or compensation for the cancelled parts of the Services.
- ii. in agreement with the Client; to suspend the remaining services until awarding of Works Contract. In such case the Consultants shall not be paid by the Client during the period between suspension and startup date of the Construction Contract, and the Consultants shall not request any payment for compensation for the duration mentioned above.

- In relation to the ongoing stages of the Consultants Services, the submission requirements for deliverables above should be allowed by the Consultants as a guideline for the extent and type of documentation that will be required by the Client during the performance of the Services. However, the Consultants shall allow in its fee for the submission of all reports, drawings, documents, etc. either specifically requested in these Terms of Reference or those which may be implied therefrom and the Contractors' contracts. The Client may however vary such requirements during the course of the Services to be performed.
- Should additional reports or copies be required extra over to those stated above or to be implied from these Terms of Reference, these shall be supplied by the Consultant(s) at the cost of preparation and reproduction of such documents, reports or drawing.
- Upon the completion of Works, the Consultants shall submit all the original copies of correspondences, documents, test results, drawings etc., relating to the Services and Works, to the Client together with indices in acceptable files and forms by the Client.

#### **VIII. Support to be provided by the client to the consultants**

- The client will sign letters with the beneficiary buildings that describe the responsibilities of the beneficiary, including appointing a contact/facility coordinator for all project phases, facilitating access to buildings or facilities, providing existing documentation, etc. Client shall, where possible, assist the Consultants in obtaining approvals, permissions from the Municipalities and other State Authorities in respect of the Services to be performed.
- The inputs (contract drawings, Bill of Quantities, tender documents, etc.) shall be provided free of charge by the Client to the Consultants. Consultant shall return all such drawings and documents received to the Client upon the completion of services.
- The Works Contractors' bidding documents are already arranged to incorporate clauses to provide temporary office facilities to the Consultants depending on the size and location of the construction sites, the size and number of rooms (generally the site office has approximately 80 m2 area and includes 1 meeting room, 3 room, 1 WC and 1 Kitchen ) shall be jointly determined by the Client and the Consultant considering the needs of the Client as well. However, these will be constructed by the Contractors and will take some time. The Consultants will be fully responsible for providing their central site office until the contractors are in place to make site offices available. The central office shall be furnished and equipped

by the Consultants, whereas the site offices shall be furnished by the Contractor. All sort of running expenses for the site offices except water and electricity (to be provided by the Contractor) shall be under the Consultant's responsibility. The Consultant shall not be required to deliver any equipment and materials provided by the reimbursable expenses and which have been used for the Services to the Client.

#### **Key staff**

- 1 Team leader / Engineer with at least Master degree in Civil Engineering or Mechanical Engineer with 10 year experience relevant to the project.
- 2 Mechanical Engineer with at least 5 years professional experience relevant to the project, preferable in energy efficiency and renewable energy; with at least Master degree, having expertise on M&V,
- 3 Electrical Engineer with at least 5 years professional experience relevant to the project, preferable in energy efficiency and renewable energy; with at least Bachelor degree, having expertise on M&V will be an asset,
- 4 Architect with at least 3 years professional experience in energy efficiency and renewable energy and relevant to the project; with at least Bachelor degree.
- 5 Environmental Engineer or equivalent with at least 3 years of experience in preparing Environmental and Social Management Plan and checklist, experience in preparing hazardous material inventories in buildings, in particular asbestos and experience with requirements and practice for proper asbestos and mercury containing CFLs removal, handling, transport and disposal/storage including monitoring and personal safety equipment requirements, with at least Bachelor's degree.

#### **Non-key Staff**

- Additional engineers, construction specialists, Cost and Planning Engineer and other staff should be included to adequately carry out all aspects of the assignment.

#### **General qualifications of all consultants:**

- Strong knowledge of local laws, standards and norms about building construction.
- Prior experience on construction supervision of buildings such as schools and administrative buildings, hospitals
- Prior experience on construction supervision of renovation of buildings
- Knowledge of energy efficiency,
- Knowledge of environmental management, health and safety
- Good communication, management, organization and reporting skills
- Excellent knowledge of Turkish and English language.
- Excellent communication, presentation and use of basic computer (Microsoft office, AutoCAD etc.) skills.