



**REPUBLIC OF TURKEY**

**MINISTRY OF ENVIRONMENT, URBANIZATION AND CLIMATE CHANGE**

**General Directorate of Construction Affairs (GDCA)**

**Seismic Resilience and Energy Efficiency in Public Buildings Project  
(P175894)**

**TERMS OF REFERENCE (TOR) FOR  
CONSULTANCY SERVICES TO PROVIDE TECHNICAL ASSISTANCE TO GDCA  
FOR  
STRUCTURAL FEASIBILITY, ENERGY AUDIT, STRUCTURAL - ENERGY EFFICIENCY  
RETROFIT DESIGN**

**((Ref: WB/CS-TA-04))**

**I. Introduction**

Exposure and vulnerability to natural hazards, including earthquakes, landslides, and floods, also threaten sustainable development in Turkey. Among these disasters, earthquakes have claimed the highest number of lives and caused the greatest economic loss, with 76 earthquakes since 1900 resulting in approximately 90,000 fatalities, a total affected population of 7 million, and direct losses exceeding US\$25 billion. About half the casualties were due to two earthquakes on the North Anatolian Fault in 1939 and 1999. In the 1999 Marmara earthquakes, which affected ten cities in the Marmara Region of Turkey, where almost 35 percent of Turkey's GNP was produced, the death toll was over 18,000 with a direct economic impact estimated at US\$5 billion (2.5 percent of GNP). Although less catastrophic, floods and landslides are frequent events in Turkey and result in localized losses. Observed and anticipated climate change impacts, such as more intense precipitation, extreme heat, and rising sea level, are expected to lead to increased risks to natural disasters, including more frequent and intense flooding in low-lying areas of river deltas and coastal cities and other extreme weather events, such as storms, hail, and tornados.

Moreover, energy efficiency is critical for Turkey to sustain its economic growth while meeting its commitments to climate change and environmental sustainability. Turkey's energy intensity (that is, its energy use per unit of GDP, or 158.4 kgoe/€1,000 of GDP in 2018) was about 35 percent higher than that of the EU-28 countries (117.9) but compared favorably with many of its neighboring countries in Eastern Europe and the Balkans (~300-500). However, as energy use per capita in Turkey rises (from 1.31 toe per capita compared with 2.2 in the EU and 4.2 in OECD countries), its energy intensity is expected to grow. This high intensity negatively

impacts energy security—Turkey's energy imports have increased in recent years, from US\$37.2 billion in 2017 to about US\$43.0 billion in 2018, and it accounts for almost 19 percent of the country's total imports. It also has a negative impact on the environment, with the energy sector accounting for 72.2 percent of the country's greenhouse gas (GHG) emissions in 2017

Therefore, it is essential to promote a national strategic approach to increasing energy efficiency and seismic performance in public buildings through an integrated approach, creating a demonstration effect, and building the foundations critical to reach scale and improving the vast building stock in Turkey. To this respect, the Government of Turkey signed a loan agreement in the amount of USD 265 million for the Seismic Resilience and Energy Efficiency in Public Buildings Project (SREEPBP) that will be implemented by the Ministry of Environment, Urbanization and Climate Change (MoEUCC).

The General Directorate of Construction Affairs (GDCA) under the MoEUCC has been delegated to assume overall responsibility for the Project. This will include the 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 Global Facility for Disaster Reduction and Recovery (GFDRR) to explore innovative approaches for structural strengthening and EE activities. The GDCA has established a project implementation unit (PIU) to administer all aspects of the Project, including raising awareness about the Project, identification of the vulnerable buildings within the agreed eligibility and prioritization, procurement of the various contractors, and Project monitoring and reporting.

## **II. Project Objectives**

The project investments will focus primarily on improving disaster resilience and energy savings in selected central government buildings and strengthening the policy framework and institutional capacity to develop, finance, and implement resilient and sustainable public buildings in Turkey. The proposed Project would be implemented through three components: (i) investments in Central Government Buildings for seismic strengthening and energy efficiency (EE) improvement; (ii) advanced technical assistance (TA) and capacity building; and (iii) project implementation support. The Project will seek to ensure minimum energy performance of the renovated buildings (i.e., Turkish Class C energy performance certificates or higher) and minimum energy savings, which will be specified and agreed upon in the Project Operations Manual. Architectural, mechanical, and electrical renovations and some renewable energy (RE) systems (e.g., rooftop solar photovoltaic (PV), ground source heat pumps, solar water heaters, and trigeneration) will also be included, subject to their economic viability. For buildings where demolition and reconstruction are necessary, all the new buildings financed by the Project will be disaster and climate-resilient and classified Class B or higher, and potentially near-zero energy buildings (nZEB).

### III. Scope of Services

Within the framework of the Project, a consulting firm, hereafter referred to as the Consultant, is required to support the PIU in implementing the Project for the initial eight months, as explained below.

Given the list of eligible buildings (hereafter referred to as "Listed Buildings") in Annex-1, the Consultant will be required to review and concur that the energy audits, detailed technical designs, reports, calculations, and technical specifications achieved under a separate consultancy (Des&Sup 01) are in line with the TOR and the standards and regulations in force in Turkey.

### IV. Description of the Consultants' Tasks

**Task 1 *Prepare inception report***, to be delivered two weeks after contract signing, which shall: (i) further define the aims and objectives of the services to be provided; (ii) set out a detailed work plan, methodology/strategy to be adopted with clear timelines and targets, for the rest of the project services to be provided; (iii) identify potential problems and possible solutions; (iv) identify the experts and counterpart staff that are going to work in cooperation with the Client.

#### ***Task 2 Review energy audits and technical designs***

- a) *Review and concur investment grade energy audit reports*, which are achieved under a separate consultancy (Des&Sup 01), in terms of their accuracy and high quality, including the appropriateness of EE and RE measures and cost-benefit analysis, etc., taking into account the climate region of the building and their compliance with the TOR and the standards and regulations in force in Turkey
  
- b) *Review and concur detailed technical designs* (including interventions for both structural and energy efficiency), including but not limited to structural assessment and feasibility reports, calculations, proposed energy efficiency improvements, and technical specifications that have been prepared on the seismic vulnerability, retrofitting feasibility, and energy efficiency of the listed buildings, considering the cost-benefit analyses of identified retrofitting solutions and energy efficiency improvements within the framework of the Turkish Earthquake Code (2018) and other relevant laws/legislations, technical norms, and standards in force in Turkey covering non-structural elements and energy efficiency improvements.  
According to the evaluation and determination of the Consultant, if required by PIU, negotiate with the design company on specifics to increase the quality and cost-effectiveness of measures and to improve the seismic and energy performances.
  
- c) *Review of bills of quantity/cost estimates*. The bills of quantity and cost estimation for the listed buildings that will be prepared by another consultant will be reviewed and verified for compliance with the energy audits, technical designs, technical completeness, and adherence to national standards and norms. According to the evaluation and determination of the Consultant, if required by PIU, negotiations shall be held with the design consultant on specifics to increase the quality and effectiveness of bills of quantity/cost estimates.

- d) Prepare a checklist for technical designs & drawings A series of Checklists for reviewing the technical designs that clarify the requirements, standards in force, and expectations applicable to drawings prepared for bidding and construction on projects shall be prepared to ensure completeness of the technical design and drawings and to be used throughout the project process.

Audits and projects involving energy efficiency improvements integrated into retrofit solutions shall also be reviewed by the academic advisor of the Consultant, and a signed concurrence report including recommendations, if any, should be obtained, in addition to the Task 2a, 2b, and 2c processes. The audits, projects, and project reports shall be delivered for acceptance by the PIU after all the above-mentioned procedures are completed.

#### ***V. Payment Schedule and other Conditions:***

Each deliverable submitted will be subject to acceptance by the PIU. Payments will be on acceptance of each deliverable submitted. The total amount will not exceed the value of the Contract unless amended.

#### ***VI. Timeline***

The estimated period for this assignment is eight months. Tasks will be carried out depending on the schedule of the outputs to be delivered under the separate consultancy (Des&Sup 01). A tentative time schedule for the completion of the consultants' services (including the Client's acceptance durations) for the various parts of the Project is given below:

**Table 1. Tentative Timeline**

No	Deliverables/Tasks	Months								
		1	2	3	4	5	6	7	8	
1	Inception Report									
2	Review energy audits and technical designs (2a, 2b, 2c, 2d)									
	2.a. Review of Investment Grade Energy Audit Reports									
	2.b. Review of Technical Designs and Design Review Reports for	2.b-1 1st Group of Buildings (4 Campuses)								
		2.b-2 2nd Group of Buildings (2 Campuses)								
		2.b-3 3rd Group of Buildings (2 Campuses)								
		2.b-4 4th Group of Buildings (3 Campuses)								
2.c. Review of bills of quantity/cost estimates										
2.d. Preparation of design review checklist										
3	Final Report									

#### ***VII. Reporting Requirements and Time Schedule for Deliverables***

All Documents need to be in English and Turkish language, unless otherwise specified. Payment will be output based. The deliverables for each task will be submitted to the PIU for acceptance. The consulting firm must obtain acceptance of the PIU for each deliverable before moving to subsequent tasks. The table below summarizes the deliverables and includes an indicative timeline and payment schedule.

**Table 2. Table of Deliverables for each Building**

<b>N°</b>	<b>Deliverables</b>	<b>Duration from signing the Contract</b>	<b>Percentage of payment released on acceptance of the deliverable</b>	
1	Inception Report	15 days	20%	
2	Review energy audits and technical designs (2a, 2b, 2c, 2d)			
	2.a. Review of Investment Grade Energy Audit Reports	4 months	10%	
	2.b. Review of Technical Designs and Design Review Reports	2.b-1 1st Group of Buildings (4 Campuses)	7 months	5%
		2.b-2 2nd Group of Buildings (2 Campuses)		5%
		2.b-3. 3rd Group of Buildings (2 Campuses)		5%
		2.b-4 4 <sup>th</sup> Group of Buildings (3 Campuses)		5%
2.c. Review of bills of quantity/cost estimates	4 months	10%		
2.d. Preparation of Design review checklist	3 months	10%		
3	Preparation of final report	1 month	30%	

As indicated in the General Conditions of Contract, all the drawings, reports, plans, specifications, and any other documents produced under this Contract are the property of the Client. Therefore, the Consultants shall also submit all the originals of the drawings and the other documents after the completion of each process.

***VIII. Facilities provided by the Consultant***

The Consultant must ensure that its professional staff has adequate support and equipment. 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.
- 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, qualified translation, interpretation, etc.

***VIII. Support to be provided by the Client to the consultants***

- The Client provides only the Listed Buildings in Annex-1.
- If any delay or no response is received from the beneficiary or other third parties during the execution of aforementioned tasks, the Consultant shall inform the Client in a timely manner by indicating the possible grounds. The Client will accelerate the process or give consent to proceed with the task.

### ***X. Consultant's Profile, Team Composition & Qualification Requirements for the Staff***

The Consultant shall provide experienced staff with proven technical and managerial competence and experience in the structural and energy efficiency assessments, related to the latest Turkish Earthquake Code and Energy Performance Regulation in Buildings. The Consultant shall separately indicate the task assignments for each staff.

- i) **Consultant's Profile:** The Consultants should be in consulting business, have similar previous experience in the scope of services, and demonstrate sound administrative and financial capacity and availability of the key experts for the performance of the services described in this TOR. The attention of interested Consultants is drawn to Section III, paragraphs 3.14, 3.16, and 3.17 of the World Bank's "Procurement Regulations for IPF Borrowers" November 2020 and The Bank's 'Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants,' (revised as of July 01, 2016) ('Anticorruption Guidelines'). Consultants may associate with other firms to enhance their qualifications but should indicate clearly whether the association is in the form of a joint venture and/or a sub-consultancy. In the case of a joint venture, all the partners in the joint venture shall be jointly and severally liable for the entire Contract if selected.
- ii) **Team Composition:** The working language of the Project is English. All the team members assigned by the Consultant must possess proficiency in the English language. All key experts shall be available immediately after the contract signature. Key experts' qualifications shall include but not be limited to the following table.  
*All expatriate staff who will work in Turkey should obtain a work permit and all who are resident for more than 90 days should obtain a non-resident visa. The Consultant will obtain all required permits, visas for all expatriate staff at his own cost. Furthermore, the Consultant will be responsible to ensure that all proposed personnel are eligible to obtain such permits and visas. The information related to visas can be obtained from the embassies and consulates of Turkey. The Client will assist the Consultant with the issue of work permits. 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.*

**Table 3. Qualification Requirements of the Staff**

Key Staff	Total Estimated Staff-Months	Required Skills and Experience
[KE.1]- Civil/Structural Engineer (Team Leader) (1)	8	<p>The Consultant will have a civil and/or structural engineering degree with at least 10 years of experience in retrofit design of structures and at least 5 years management experience. Experience in Turkey and knowledge of the Turkish Earthquake Code (2018) and other relevant laws/legislations, technical norms, and standards in force in Turkey, specific experience in Energy Efficiency field would be an asset. The Consultant must be fluent in English. The Consultant will:</p> <ul style="list-style-type: none"> <li>• Take full responsibility for the consulting team and as per the scope of work, provide overall direction to the consulting team, and coordinate between individual experts;</li> <li>• Carry out extensive consultations with the key stakeholders obtaining suggestions and concurrence with the contents of the plan;</li> <li>• Lead the consultants' work and ensure the Contract's efficacy through detailed review, monitoring, assessment and required improvements to the works of the consultants' team;</li> <li>• Coordinate design reviews and endorsements for structural retrofitting &amp; energy efficiency renovations. Design reviews and endorsement will certify that the building's resilience to targeted seismic intensity is ensured and targeted level of energy efficiency is achieved;</li> <li>• Schedule and organize project meetings;</li> <li>• Ensure timely delivery and quality control of the outputs required as per the scope of work.</li> </ul>
[KE.2-3] Structural Engineer (2)	14	<p>The Consultant will have a civil and/or structural engineering degree (MSc or PhD degree would be an asset) with at least 10 years of specific experience in retrofit design of structures. Experience working within Turkey, and knowledge of the Turkish Earthquake Code (2018) and other relevant laws/legislations, technical norms and standards in force in Turkey is an advantage.</p>
[KE.4] Mechanical Engineer (1)	8	<p>The Mechanical Engineer shall have Bachelor's degree in Mechanical Engineering (MSc or PhD degree would be an asset) with at least 10 years of professional experience in related field with specific experience in Energy Efficiency/Energy Audit / Energy sector, Preparation of technical designs/Preparation of Policy/ Guidelines/ Manuals/Directives, and have at least one of the following certificates: M&amp;V, Energy Manager, Audit Project Certificate</p>
[KE.5] Electrical Engineer (1)	8	<p>The Electrical Engineer shall have Bachelor's degree in Electrical Engineering (MSc or PhD degree would be an asset) with at least 10 years of professional experience in related field with specific experience in Energy Efficiency/Energy Audit/Energy sector, Preparation of Policy/Guidelines/Manuals/Directives, and have at least one of the following certificates: M&amp;V, Energy Manager, Audit Project Certificate</p>
[KE.6] Architect (1)	8	<p>The Architect shall have Bachelor's degree in architecture (MA/MSc or PhD degree would be an asset) with at least 5 years of professional experience in related field with specific experience in Energy Efficiency/Energy Audit/Energy sector, Preparation of Policy/Guidelines/Manuals/Directives.</p>

[KE.7]-Academic Advisor (1)	4	<p>Minimum at the assistant professor level with a specific expertise in Energy Efficiency in Buildings building sector. At least 10 years of demonstrable experience in supervising project/programmes including implementation in the renewable energy /energy efficiency/ sustainability sector.</p> <p>Having one of the following certificates: M&amp;V, Energy Manager, Audit Project Certificate, is also desirable.</p>
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### Annex-1: Building List

CAMPUS NO	NO	OWNERSHIP	BUILDING NAME	REGION	PROVINCE	DISTRICT	TYPE of BUILDING	BUILDING	CONST. YEAR	AREA (m <sup>2</sup> )
1	1	Boğaziçi University	Deprem Mühendisliği Binası	Marmara	İstanbul (Asia)	Kandilli	Educational Settings	1	1991	1458,00
	2	Boğaziçi University	Afete Hazırlık Eğitim Birimi (AHEB)	Marmara	İstanbul (Asia)		Educational Settings	1	1996	1695,00
	3	Boğaziçi University	Yeni Jeofizik Binası	Marmara	İstanbul (Asia)		Educational Settings	1	1995	1102,00
2	4	Boğaziçi University	Kapalı Spor Salonu	Marmara	İstanbul (Europe)	Sarıyer (Uçaksavar)	Educational Settings	1	1999	2862,00
	5	Boğaziçi University	Superdorm (Otopark)	Marmara	İstanbul (Europe)		Educational Settings	1	1989	19700,00
3	6	Boğaziçi University	1. Öğrenci Yurdu	Marmara	İstanbul (Europe)	Sarıyer (Kilyos)	Educational Settings	8	2002	9482,00
	7	Boğaziçi University	YADYOK Derslik B Blok	Marmara	İstanbul (Europe)		Educational Settings	1	1991	3655,00
	8	Boğaziçi University	Sosyal Tesis & Yurt	Marmara	İstanbul (Europe)		Educational Settings	1	1994	2080,00
	9	Boğaziçi University	YADYOK Derslik A Blok	Marmara	İstanbul (Europe)		Educational Settings	1	1991	5681,00
4	10	Ministry of Interior	Hükümet Konağı	Marmara	Sakarya	Adapazarı	Administrative Buildings	1	2001	42656,00
5	11	Ministry of Youth & Sports	Gazanfer Bilge Öğrenci Yurdu	Marmara	Kocaeli	Karamürsel	Dormitory and Social Facilities	1	2005	13520,00
6	12	Ministry of Youth & Sports	Kandıra Öğrenci Yurdu	Marmara	Kocaeli	Kandıra	Dormitory and Social Facilities	1	2007	11340,00
7	13	Marmara University	Yabancı Diller Yüksek Okulu	Marmara	İstanbul (Asia)	Kadıköy	Educational Settings	1	1996	2250,00
	14	Marmara University	Mühendislik Fakültesi	Marmara	İstanbul (Asia)		Educational Settings	1	1992	2400,00
	15	Marmara University	Teknik Eğitim Fakültesi	Marmara	İstanbul (Asia)		Educational Settings	1	1994	1200,00
	16	Marmara University	Atatürk Eğitim Fakültesi	Marmara	İstanbul (Asia)		Educational Settings	1	1982	16200,00

8	17	İstanbul Technical University	Vadi Yemekhane	Marmara	İstanbul (Europe)	Ayazağa	Dormitory and Social Facilities	1	1994	1350,00
	18	İstanbul Technical University	Vadi Spor Salonu	Marmara	İstanbul (Europe)		Dormitory and Social Facilities	1	1994	1298,00
	19	İstanbul Technical University	Vadi Yurdu B	Marmara	İstanbul (Europe)		Dormitory and Social Facilities	1	1994	5151,06
	20	İstanbul Technical University	Vadi Yurdu C	Marmara	İstanbul (Europe)		Dormitory and Social Facilities	1	1994	5179,42
	21	İstanbul Technical University	Vadi Yurdu D	Marmara	İstanbul (Europe)		Dormitory and Social Facilities	1	1994	5160,71
	22	İstanbul Technical University	Vadi Yurdu E	Marmara	İstanbul (Europe)		Dormitory and Social Facilities	1	1994	5177,40
9	23	İstanbul Technical University	Uçak Uzay Fakültesi	Marmara	İstanbul (Europe)	Ayazağa	Educational Settings	4	1992	8414,29
	24	İstanbul Technical University	Ayazağa Kız Öğrenci Yurdu	Marmara	İstanbul (Europe)		Dormitory and Social Facilities	1	1992	3395,25
	25	İstanbul Technical University	Fen Bilimleri Enstitüsü	Marmara	İstanbul (Europe)		Educational Settings	1	1989	4361,00
	26	İstanbul Technical University	Gemi İnşaat Fakültesi	Marmara	İstanbul (Europe)		Educational Settings	6	1987	13020,00
	27	İstanbul Technical University	Maden Fakültesi	Marmara	İstanbul (Europe)		Educational Settings	13	1987	18765,85
	28	İstanbul Technical University	Kapalı Spor Salonu	Marmara	İstanbul (Europe)		Educational Settings	3	1986	2500,00
10	29	İstanbul University Cerrahpaşa Rectorate	Öğrenci Kültür Merkezi	Marmara	İstanbul (Europe)	Avcılar	Educational Settings	1	1998	9349,00
	30	İstanbul University Cerrahpaşa Rectorate	Merkez Laboratuvar	Marmara	İstanbul (Europe)		Educational Settings	1	2001	1240,00
	31	İstanbul University Cerrahpaşa Rectorate	Rektörlük İdari Binası	Marmara	İstanbul (Europe)		Educational Settings	1	1990	2840,00

11	32	İstanbul University Cerrahpaşa Rectorate	C Blok Yurt Binası	Marmara	İstanbul (Europe)	Büyükc�ekmece	Dormitory and Social Facilities	1	1996	3650,00
	33	İstanbul University Cerrahpaşa Rectorate	V Blok Yurt Binası	Marmara	İstanbul (Europe)		Dormitory and Social Facilities	1	1996	8000,00
							TOTAL	62		236132,98