

Terms of Reference

Preparation of Detailed Designs for Rehabilitation of Dilijan Tunnel and Pushkin Tunnel, Environmental Evaluation/Assessment Documentation and Technical Part of Bidding Documents for Civil Works Procurement (Lump Sum Assignment)

1. Background

- 1.1 The Republic of Armenia has received a € 44.1 (equivalent of \$50.0 million) loan from the Asian Development Bank to finance rehabilitation of the Armenia-Georgia Border Regional Road (M6, Vanadzor-Bagratashen) Improvement Project and intends to apply the unutilized part of the proceeds for rehabilitation of 2 vehicular tunnels: Dilijan tunnel located on the 80-83 kilometer of interstate road M-4 Yerevan – Sevan – Ijevan – Azerbaijan border and Pushkin tunnel located on the 135-137 kilometer of interstate road M-3 Margara – Vanadzor – Tashir – Georgia border.
- 1.2 The Ministry of Territorial Administration and Infrastructure of Armenia (MTAI) has the overall responsibility for implementation of the Project and has delegated implementation functions to the Road Department SNCO (RD).
- 1.3 The MTAI through the RD (hereinafter: “the Client”) will hire a consulting firm or an association in the form of joint venture or sub-consultancy (hereinafter: “the Consultant”) with specific experience in designing of road infrastructure/tunnels to undertake an assignment for Provision of Detailed Designs and Bidding Documents for rehabilitation of the two above-mentioned vehicular tunnels.
- 1.4 The Consultant will be selected under the Quality-and Cost-Based selection (QCBS) procedures, described in the Guidelines (Use of Consultants by ADB and Its Borrowers, March 2013).
- 1.5 The Dilijan tunnel (length -2344 m, width - 8 m, height - 5 m) connects the south-west of the Tavush region of Armenia with the north-east of Gegharkunik region of Armenia and is of great importance for the route Yerevan-Dilijan-Vanadzor-Georgia border. The construction of the Dilijan tunnel began in 1970, but was suspended in 1992 due to lack of funding. The renewed construction started in 2001 and was completed in 2003. The tunnel was seriously affected by a big fire inside in 2019.
- 1.6 The Pushkin tunnel (length: 1830 m, width: 8 m, height: 4.5+2.2m) connects Vanadzor to Stepanavan and is of great importance for the route Yerevan-Spitak-Vanadzor-Tashir-Georgia border. Constructed in 1971 the tunnel was seriously damaged by the earthquake in 1988 and was rehabilitated in 2000. All the engineering systems were designed and installed in accordance with currently outdated norms and standards. Most of the engineering systems of the tunnel (firefighting, ventilation, drainage, lighting etc.) now are almost out of order and fail very often. The drainage pipes and concrete structures on several spots are gradually deteriorating because of penetrating aggressive waters.

2. Objectives of the assignment

- 2.1 The objectives of the assignment are:

- preparation of Detailed Design packages for rehabilitation of Dilijan tunnel and Pushkin tunnel (hereinafter: “the Tunnels”)
- preparation of relevant environmental evaluation/assessment documentation in accordance with RA legislation and ADB Safeguard Policies Statement (ADB SPS, 2009)
- preparation of technical part of Bidding Documents for civil works procurement.

3. Scope of Services

3.1 The Consultant shall implement following main activities:

- Task 1: Detailed investigation of the current state of the Tunnels, including tunnel all systems.
- Task 2: Preparation of Detailed Designs for the restoration of the Tunnels (including tunnel all systems), preparation of relevant environmental evaluation/assessment documentation in accordance with RA legislation and ADB Safeguard Policies Statement (ADB SPS, 2009) as well as preparation of the technical part of the Bidding Documents for civil works procurement under ADB procedures for International Competitive Bidding (ICB).

3.2 Design Standards to be applied:

The standards to be applied for this assignment are GOST 33153-2014 and/or relevant European Norms. The Consultant shall choose standards with stricter requirements. Only after the Client approves the proposed standards, they can be used for design.

3.3 Safeguards

The Consultant shall be responsible for the preparation of the environmental evaluation/assessment documentation, including EIA/IEE (if required), EMP, baseline monitoring/modeling of environmental safeguards (air, noise, dust, vibration, water quality, soil, biodiversity) in accordance with RA relevant legislation and ADB Safeguard Policies Statement (ADB SPS, 2009) guidelines/requirements.

3.4 The detailed description of the Consultant's work is given below:

Task 1: Detailed investigation of the current state of the Tunnels, including tunnel all systems

In this stage the Consultant shall conduct surveys of the actual condition of the Tunnels and their ancillary engineering networks. The surveys shall include description of existing condition of the Tunnels, defects and incompliance, and other information necessary for feasibility assessment to be undertaken by the Consultant. The main works to be performed by the Consultant within the framework of this task shall include, but not be limited to the following:

- a) Based on the engineering studies and analysis of the previous design documents, economic analysis, geotechnical tests, inspection surveys, the Consultant shall identify all the possible preliminary solutions for the project and shall establish the merits and drawback of each solution which should determine the final option to be

adopted taking into consideration the required design life. The design life of the Tunnels shall be 40 years. These solutions may range from periodic maintenance options to rehabilitation, or a combination of options. It will be necessary for the Consultant to provide comparative data of rehabilitation and maintenance costs for the different design standards to support the final design adopted for the project.

- b) Based on the analysis so carried out, the Consultant shall prepare logic diagrams and schedules based on the preliminary reviews to map out the entire process. This is important so that tunnel maintenance/rehabilitation is not interpreted based on individual deterioration but is addressed holistically, considering all possible causes together with relevant parameters and consequences (danger for the users or residents, risks for the structures).
- c) Consultant shall carry out preliminary inspections and required resources for establishing a Quality Plan (QP) for the detail inspections investigatory work. Client will decide whether these additional investigations should be conducted to confirm the causes for the preliminary diagnosis.
- d) The Consultant shall carry out the necessary field surveys (topographical surveys, hydrological studies, geotechnical studies, traffic studies, sub-surface soil exploration, materials surveys, laboratory investigations, availability, and location of suitable construction materials etc.), necessary for the examination of various design solutions
- e) The Consultant shall carry out Traffic Data Collection and Traffic Analysis. The Consultant shall determine the type and volume of the existing traffic between the two portals of the Tunnel by analyzing all existing statistical data, and by conducting and analyzing the data provided by the Client. The Consultant shall verify this data with selected field traffic investigations (24 hour counting) as required. The traffic studies will include:
 - *existing traffic composition (by appropriate vehicle types) and volume counts; and*
 - *forecasts (for 40 years) of annual average daily traffic composed of normal, generated and diverted flows by appropriate vehicle types.*

The Consultant shall combine the results of his traffic counts with the available ones to determine any growth trends that could be used for the detailed traffic forecasting study.

- f) The Consultant shall investigate and assess the Tunnel in terms of compliance with safety standards and, if needed, provide solutions towards improvement of the current situation. The Consultant shall review the existing site condition and list areas where minor intervention would improve road and construction safety. The possible options must be discussed with the Client during the design phase and, where possible, be incorporated in the final design. Detailed description of the safety issues considered, and corresponding measures taken shall be provided in the Explanatory Note of the Detailed Design.
- g) The Consultant shall carry out a detailed instrumental examination of the roof and walls of the Tunnels in accordance with the norms for the examination of tunnels in force in Armenia. The description of the defects shall be supported by photos.
- h) Implementation of topographic survey for the tunnel road pavement and approach road. Topographic survey for approach road shall be implemented for 150 m before and after the Tunnels.

- i) Investigation of the causes of surface water infiltration. Implementation of topographic survey of these sections in M1500 scale. Provide appropriate solutions to exclude or minimize the water penetration.
- j) Selection of road pavement shall be based on calculations. The Consultant shall conduct all possible and required tests, data collection and an appropriate calculation based on these data and include in the design package. Data required for existing pavement survey shall be collected at 100 m intervals. The design package shall include detailed description of condition of the existing pavement, the technical condition of the structural layers, the thickness, etc.
- k) Examination and assessment of the existing fire protection system and, if necessary, its replacement with the new one. Requirements provided by the Consultant shall be based on the defects or non-compliances identified during the investigation. Defects or non-compliances shall be described supported by photos.
- l) Examination of existing electrical system and power supply cables and wires. Design package shall include the description of the defects or non-compliances and the respective photos. If necessary, provide replacement of the power supply system in compliance with the current normative requirements. Provide a calculation of the corresponding capacity needed for the substation of the modified or reconstructed power network.
- m) Investigation and study of existing lighting network, identification of defects and non-compliances. Provide a report on the state of the existing network and design the network reconstruction, if necessary. Provide LED energy-saving luminaires according to the corresponding lighting calculation.
- n) Investigate and describe (attaching photos if possible) separately the existing water supply and drainage systems. Any defect or non-compliance identified during the investigation shall serve as basis for design work. Depending on the current state, partial rehabilitation or completely new water supply and drainage systems shall be envisaged. Examine groundwater flows, and if necessary, take appropriate measures, using directional water drainage. The hydrological calculation shall be enclosed to the design.
- o) Investigate the existing ventilation system and describe all current defects. Restoration of existing ventilation system or, if necessary, implementation of a new ventilation system shall be in compliance with the existing regulatory requirements and based on calculations. Ventilation calculation shall be enclosed to design.
- p) Provision/ modernization of the security system.
- q) Provision/ modernization of means of communication. Provide an equipped control center for management of all engineering systems of the Tunnels.
- r) Conduct laboratory tests necessary to complete the investigations and process the results. In addition, as needed, test the elements of natural portal zones, lined sections, prefabricated composite structures, deterioration analysis, geomembrane seals, etc.
- s) The Consultant's environmental study shall include, but not be limited to the following:
 - *Collection and documentation of baseline of biodiversity, water quality, air quality, soil, dust, noise, and vibration,*
 - *Assessment of all potential direct and indirect environmental impacts;*
 - *Present impacts in the order of project cycle: pre-construction, construction, and operation.*

- t) Preparation of the project Environmental Scoping Report, including evaluation of the project environmental categorization (A, B, C). A separate cost estimate of environmental mitigation measures and monitoring shall be developed to be included in detailed IEE-EMP to be developed at detailed design stage.
- u) After completing all the necessary investigations, the Consultant must prepare a survey report (hereinafter: Survey Report) with a detailed description of the survey methodology, methodology of the planned reconstruction/rehabilitation works, the requirements of the normative requirements for the planned works, defects found in each tunnel and the engineering systems (with photographs), the results and calculations of each survey, the laboratory tests results, as well as with the Consultant's preliminary proposals regarding the repair of the defects found. The Survey Report will be reviewed by the Client's specialists and the Consultant will be provided with appropriate comments (if any). The Consultant will have to consider the Client's comments and take them into account in the revised version of the Survey Report.

Task 2: Preparation of Detailed Designs for the restoration of the Tunnels (including tunnel all systems), preparation of relevant environmental evaluation/assessment documentation in accordance with RA legislation and ADB Safeguard Policies Statement (ADB SPS, 2009) as well as preparation of the technical part of the Bidding Documents for civil works procurement under ADB procedures for International Competitive Bidding (ICB).

The following requirements are set for this task:

- a) All design solutions as well as the composition and content of the detailed design package (hereinafter: Detailed Design Package) shall be must be discussed and agreed with the Client without fail.
- b) All design solutions shall be based on the corresponding necessary technical calculations (calculation of the road pavement, calculation of the capacity of the drainage system, illumination calculation, calculation of ventilation system capacity, etc.), which shall be carried out by the Consultant at the design preparation stage and shall be included in the Detailed Design Package.
- c) All drawings, sheets, standard drawings, cross and longitudinal sections, which must be included in the Detailed Design Package, must be prepared in the format and in scales required by the norms of the Republic of Armenia for the preparation of designs. The Consultant must agree in advance with the Client the scales of the drawings that will be used in the design.
- d) In accordance with the legislation of the Republic of Armenia, the Detailed Design Package must undergo an appropriate expertise, which will be organized and carried out by the Client. In the event that errors or omissions are revealed in the course of this expertise, the Consultant must correct them and provide the Client with a revised version of the Detailed Design Package at no additional cost to the Client.
- e) The detailed design package for Tunnel rehabilitation shall include, but not be limited to the following:
 - i. Explanatory note (with a detailed description of design solutions and other information required in accordance with the norms of the Republic of Armenia for the preparation of designs),

- ii. Detailed design (including all necessary drawings, calculations, etc.) and detailed Bill of Quantities for rehabilitation/reconstruction of roof and walls of the Tunnel,
- iii. Detailed design (including all necessary drawings, calculations, etc.) and detailed Bill of Quantities for rehabilitation/reconstruction of road pavement and sidewalks,
- iv. Detailed design (including all necessary drawings, calculations, etc.) and detailed Bill of Quantities for rehabilitation/reconstruction of Tunnel lighting,
- v. Detailed design (including all necessary drawings, calculations, etc.) and detailed Bill of Quantities for rehabilitation/reconstruction of Tunnel ventilation system,
- vi. Detailed design (including all necessary drawings, calculations, etc.) and detailed Bill of Quantities for rehabilitation/reconstruction of Tunnel power supply system,
- vii. Detailed design (including all necessary drawings, calculations, etc.) and detailed Bill of Quantities for rehabilitation/reconstruction of Tunnel water supply and drainage,
- viii. Detailed design (including all necessary drawings, calculations, etc.) and detailed Bill of Quantities for rehabilitation/reconstruction of Tunnel other engineering utilities,
- ix. Detailed design (including all necessary drawings, calculations, etc.) and detailed Bill of Quantities for rehabilitation/reconstruction of Tunnel traffic safety elements (The Consultant must agree this part of the design with the Road Police of the Republic of Armenia in advance.),
- x. Detailed design (including all necessary drawings, calculations, etc.) and detailed Bill of Quantities for rehabilitation/reconstruction of Tunnel emergency system,
- xi. Technical Specifications covering all the work types envisaged in the Detailed Design.
- xii. Bill of Quantities for rehabilitation/reconstruction of Tunnel (including Tunnel all systems). The Bill of Quantities shall be based on the various items of work to be executed in accordance with the Detailed Design Drawings, Summaries, and the Technical Specifications. The items in the Bill of Quantities and the work (pay) items specified in the Technical Specifications shall correspond to each other.
- xiii. Construction/rehabilitation works plan indicating at least:
 - organization of the construction site (including required schemes),
 - organization of traffic safety during construction/rehabilitation (necessary schemes, which the Consultant must agree in advance with the Road Police of the Republic of Armenia), considering the high traffic periods, winter viability, other scheduled projects in the vicinity, possibilities for diversion, etc.
 - minimum number and types of equipment / machines necessary for performing construction/rehabilitation works,
- xiv. Cost estimates for rehabilitation/reconstruction works of Tunnel (including Tunnel all systems), prepared in accordance with Armenian norms, rules, and bulletins.

The Consultant shall also develop a confidential Unit Price Analysis for each work item and a Confidential Cost Estimate, for each work item, work category and contract package as a whole. Unit prices shall be classified into direct costs (labor, materials, and equipment), indirect costs (mobilization, on-site and general overheads, contractor's contingencies, and profit) and taxes. The Consultant's Confidential Cost Estimate shall break out separately all taxes for ease of identification. Cost Estimate and Bill of Quantity shall be closer with formats and shall be comparable to each other.

- f) Based on detailed design, the Consultant shall:
- i. Prepare and deliver environmental management documents including EIA/IEE, EMP and all necessary associated documents, for submission to ADB and Environmental Impact Assessment Expertise of Ministry of Environment of RA by the Client.
 - ii. Prepare and deliver Health & Safety, Emergency Prevention and Preparedness plans for the works so as to assure the public and workers safety.
 - iii. Attend meetings for the processing of the EIA/IEE and assist the Client to obtain environmental clearance certification.
 - iv. Prepare and deliver detailed IEE-EMP and site specific EMP (SEMP) templet based on the baseline surveys (biodiversity, water quality, air quality, soil, dust, noise, and vibration) and Environmental Scoping Report in accordance with RA legislation and ADB Safeguard Policies Statement (ADB SPS, 2009). Upgrade and/or review IEE-EMP as per ADB's and Client request and conduct all necessary demarches in order to support the Client to obtain all required environmental permits and approvals (ADB and RA).
 - v. Take all necessary actions to comply with relevant Legislation, including application for and obtaining Location Clearance Certificate and Environmental Clearance Certificate, assist the Client in organizing Public- and Stakeholders' consultations, participate in them and, if necessary, also initiate such consultations.
 - vi. Obtain all clearances – Permits, Authorizations (e.g., Construction waste disposal, tree-cutting etc.).
 - vii. Support the Client to incorporate Environmental Safeguards Requirements into the Construction Bidding documents.
 - viii. Review/update the EIA/IEE and Environmental Management and Monitoring Plan as per request of lenders and/or Client.

4. Deliverables

All documents produced within the Consulting Services shall be delivered in 6 bilingual (Armenian and English) hard copies, 1 bilingual (Armenian and English) soft copy (PDF) and 1 bilingual (Armenian and English) editable soft copy (AutoCAD, MS Word, MS Excel).

Deliverables	Description	Time for Submission	Payment upon Acceptance (lump-sum)
Deliverable 1	<p><u>Inception Report</u> The Report shall set out the Consultant's detailed work program including the staffing- and time schedules, and an updated version of initially submitted methodology for the services. The deliverable will be considered finally accepted only after signing by both parties an appropriate Acceptance Certificate.</p>	15 days after commencement of Consulting Services.	5% of the Contract Price
Deliverable 2	<p><u>Survey Reports (for each tunnel, including all engineering systems) described in Sub-Clause 3.4 (Task 1)</u> The deliverable will be considered finally accepted only after signing by both parties an appropriate Acceptance Certificate.</p>	3 months after commencement of Consulting Services.	30% of the Contract Price
Deliverable 3	<p><u>Detailed Design Packages, relevant environmental evaluation/assessment documentation and the technical part of the Bidding Documents for civil works procurement for each tunnel according to the Sub-Clause 3.4 (Task 2)</u> The deliverable will be considered finally accepted only after signing by both parties an appropriate Acceptance Certificate.</p>	6 months after commencement of Consulting Services.	65% of the Contract Price

5. Facilities and Equipment

5.1 Provided by the Client. Client will provide the Consultant all readily available material and data relating to the consulting services defined under this TOR.

5.2 Provided by the Consultant. The Consultant shall be responsible to cover all expenses, included rental of appropriate site office space, if necessary, in Consultation with the Client. The Consultant shall also be responsible to take care of office space, vehicles,

accommodation, maintenance, furniture, office equipment and all relevant and administrative costs. The Consultant is required to have all necessary equipment, material, and tools to complete the tasks.

6. Consultant's Team Composition

6.1 The Consultant is expected to provide a team comprising of qualified experts having at least bachelor's degree from an accredited university and satisfactory experience in implementing projects of similar nature and size. The curriculum vitae of the specialists must contain information of the assignments they have successfully completed in the last 5 years, with complete names and addresses of the clients and the name and contact information of the immediate supervisors.

The Consultant's Team minimum composition would be but not limited to the following (however, the Consultant is requested to organize his resources so as to deliver the assignment in the most effective way):

Team Leader– Key Expert 1, International Expert

The Team Leader will be responsible for overall project management in performing scope of work indicated in the Terms of Reference for the Consulting Services.

Experience, qualifications and skills: The candidate shall have a Bachelor's or higher degree in civil or construction engineering from an accredited university, and at least 10 years of professional experience with proven records. The candidate shall have preferably 7- and more years of international experience as a project manager or a team leader in civil engineering or highway design projects financed by ADB or other MDBs.

Detailed Tasks and Reporting Requirements:

- All administration and managerial work related to all aspects of the Project, including the preparation of the reports and detailed designs, as well as management of the whole Consultant's staff
- Permanent liaison and advice to the Client
- Other tasks needed for timely and successful implementation of the assignment.

Tunnel Design Engineer - Key Expert 2, International Expert

The Tunnel Design Engineer will be responsible for performing the scope of work indicated in the Terms of Reference for the Consulting Services.

Experience, qualifications and skills: The candidate shall have a Bachelor's or higher degree in civil or construction engineering from an accredited university, and at least 7 years of professional experience with proven records. The candidate shall have preferably 5- and more years of international experience in tunnel engineering and/or tunnel design projects financed by ADB or other MDBs. Computer skills: MS Office, AutoCAD.

Detailed Tasks and Reporting Requirements:

- Tunnel condition assessment
- Examination of the roof and walls of the Tunnels
- Identification of existing or potential issues, providing design solutions for preventing, mitigation or rehabilitation

- Other tasks needed for timely and successful implementation of the assignment.

Geotechnical Engineer - Key Expert 3, International Expert

The Geotechnical Engineer will be responsible for performing the scope of work indicated in the Terms of Reference for the Consulting Services.

Experience, qualifications and skills: The candidate shall have a Bachelor's or higher degree in civil or geotechnical engineering from an accredited university, and at least 7 years of professional experience with proven records. The candidate shall have preferably 5- and more years of international experience in geotechnical engineering. Computer skills: MS Office, AutoCAD.

Detailed Tasks and Reporting Requirements:

- Geotechnical studies
- Identification of existing or potential issues, providing design solutions for preventing, mitigation or rehabilitation
- Other tasks needed for timely and successful implementation of the assignment.

Hydrotechnical/drainage Engineer - Key Expert 4, International Expert

The Hydrotechnical/drainage Engineer will be responsible for performing the scope of work indicated in the Terms of Reference for the Consulting Services.

Experience, qualifications and skills: The candidate shall have a Bachelor's or higher degree in civil engineering from an accredited university, and at least 7 years of professional experience with proven records. The candidate shall have preferably 5- and more years of international experience in hydrotechnical engineering (hydrology, hydraulics) and designing water supply and drainage systems.

Computer skills: MS Office, AutoCAD.

Detailed Tasks and Reporting Requirements:

- Hydrological studies and calculations
- Investigation of the causes of surface water infiltration
- Examine the existing water supply and drainage systems
- Identification of existing or potential issues, providing design solutions for preventing, mitigation or rehabilitation
- Other tasks needed for timely and successful implementation of the assignment.

Tunnel Ventilation Engineer - Key Expert 5, International Expert

The Tunnel Ventilation Engineer will be responsible for performing the scope of work indicated in the Terms of Reference for the Consulting Services.

Experience, qualifications and skills: The candidate shall have a Bachelor's or higher engineering degree from an accredited university, be specialized in ventilation engineering and have at least 7 years of professional experience with proven records. The candidate shall have preferably 5- and more years of international experience in designing of ventilation systems. Computer skills: MS Office, AutoCAD.

Detailed Tasks and Reporting Requirements:

- Investigate the existing ventilation system

- Identification of existing or potential issues, providing design solutions for preventing, mitigation or rehabilitation or, if necessary, also for a new ventilation system.

Fire Protection System Engineer - Key Expert 6, International Expert

The Fire Protection System Engineer will be responsible for performing the scope of work indicated in the Terms of Reference for the Consulting Services.

Experience, qualifications and skills: The candidate shall have a Bachelor's or higher engineering degree from an accredited university, be specialized in fire protection engineering and have at least 7 years of professional experience with proven records. The candidate shall have preferably 5- and more years of international experience in designing fire protection systems. Computer skills: MS Office, AutoCAD.

Detailed Tasks and Reporting Requirements:

- Investigate the existing fire protection system
- Identification of existing or potential issues, providing design solutions for preventing, mitigation or rehabilitation or, if necessary, also for a new fire protection system.

Lighting System Engineer - Key Expert 7, International Expert

The Lighting System Engineer will be responsible for performing the scope of work indicated in the Terms of Reference for the Consulting Services.

Experience, qualifications and skills: The candidate shall have a Bachelor's or higher engineering degree from an accredited university, be specialized in lighting engineering and have at least 7 years of professional experience with proven records. The candidate shall have preferably 5- and more years of international experience in designing tunnel lighting systems. Computer skills: MS Office, AutoCAD.

Detailed Tasks and Reporting Requirements:

- Investigate the existing lighting system
- Identification of existing issues, providing design solutions for improvement or, if necessary, also for a new lighting system.

Road Safety Specialist - Key Expert 8, International Expert

The Road Safety Specialist will be responsible for performing the scope of work indicated in the Terms of Reference for the Consulting Services.

Experience, qualifications and skills: The candidate shall have a Bachelor's or higher degree in civil engineering from an accredited university and have at least 7 years of professional experience with proven records. The candidate shall have preferably 5- and more years of international experience in traffic management and road safety. Computer skills: MS Office, AutoCAD.

Detailed Tasks and Reporting Requirements:

- Review the existing site condition
- Identification of existing safety issues, recommend minor interventions to improve road safety.
- Review the final detailed design in terms of road safety and make recommendations if necessary.

Video Surveillance Engineer - Key Expert 9, International Expert

The Video Surveillance Engineer will be responsible for performing the scope of work indicated in the Terms of Reference for the Consulting Services.

Experience, qualifications and skills: The candidate shall have a Bachelor's or higher engineering degree from an accredited university and have at least 7 years of professional experience in video surveillance engineering with proven records. The candidate shall have preferably 5- and more years of international experience in designing tunnels video surveillance systems. Computer skills: MS Office, AutoCAD.

Detailed Tasks and Reporting Requirements:

- Review the existing site condition
- Identification of existing issues, providing design solutions for improvement or, if necessary, also for a new video surveillance system.

Environmental and Social safeguards Expert - Key Expert 10, National Expert

The Environmental and Social safeguards Expert will be responsible for performing the scope of work indicated in the Terms of Reference for the Consulting Services.

Experience, qualifications and skills: The candidate shall have a Bachelor's or higher degree from an accredited university and have at least 7 years of professional experience in environmental/social impact assessment with proven records. The candidate shall have preferably 5- and more years of experience in environmental /social impact assessment in ADB or other MDB financed projects. Knowledge of English is mandatory. Computer skills: MS Office.

Detailed Tasks and Reporting Requirements:

- Identification of existing environmental/social issues, providing mitigation solutions, preparation of all environment and social related documents set forth in the Terms of Reference necessary for the Consulting Services

Electricity Supply System Engineer - Key Expert 11, International Expert

The Electricity Supply System Engineer will be responsible for performing the scope of work indicated in the Terms of Reference for the Consulting Services.

Experience, qualifications and skills: The candidate shall have a Bachelor's or higher engineering degree from an accredited university, be specialized in electrical engineering and have at least 7 years of professional experience with proven records. The candidate shall have preferably 5- and more years of experience in designing electrical infrastructures. Computer skills: MS Office, AutoCAD.

Detailed Tasks and Reporting Requirements:

- Investigate the existing electrical infrastructure
- Identification of existing issues, providing design solutions for rehabilitation, improvement or, if necessary, also for a new electrical supply system.

Highway Design Engineer – Non-Key Expert 1, National Expert

The Highway Design Engineer will be responsible for performing the scope of work indicated in the Terms of Reference for the Consulting Services.

Experience, qualifications and skills: The candidate shall have a Bachelor's or higher degree in civil engineering from an accredited university and have at least 7 years of professional experience with proven records. The candidate shall have preferably 5- and more years of experience in road design assignments.

Computer skills: MS Office, AutoCAD.

Detailed Tasks and Reporting Requirements:

- Review the existing site condition
- Identification of existing issues and, if necessary, providing design solutions for improvement.

Pavement Design Engineer - Non-Key Expert 2, National Expert

The Pavement Design Engineer will be responsible for performing the scope of work indicated in the Terms of Reference for the Consulting Services.

Experience, qualifications, and skills: The candidate shall have a Bachelor's or higher degree in civil or construction engineering from an accredited university and have at least 7 years of professional experience with proven records. The candidate shall have preferably 5- and more years of experience in road pavement design. Computer skills: MS Office, AutoCAD.

Detailed Tasks and Reporting Requirements:

- Investigate the existing road pavement
- Identification of existing issues, providing design solutions for rehabilitation, improvement or, if necessary, also for a new pavement.

Cost Estimator - Non-Key Expert 3, National Expert

The Cost Estimator will be responsible for performing the scope of work indicated in the Terms of Reference for the Consulting Services.

Experience, qualifications, and skills: The candidate shall have a Bachelor's or higher degree in civil engineering or economics from an accredited university and have at least 7 years of professional experience with proven records. The candidate shall have preferably 5- and more years of experience in construction cost estimation. Computer skills: MS Office.

Detailed Tasks and Reporting Requirements:

- Preparation of cost estimates of the proposed design solutions.