

**Roads Department of the Ministry of Regional Development and
Infrastructure**



TERMS OF REFERENCE

For installation of Highway/Roadway lighting network on roads and structures

Tbilisi

2020

1. Design services to be provided

1.1. Name and scope of the design services to be provided:

Services related to the preparation of technical documentation for execution of design-estimating and bidding procedures required for installation of Highway/Roadway lighting network on roads and structures

Referred services imply rendering of design services required for installation of Highway/Roadway lighting network at below listed objects.

Lot 1 – Initial Report:

Before submission of the detailed design, within one month from the commencement of the services, Supplier shall provide to the Procurer framework document on installation of Highway/Roadway lighting on the highways, which should include consideration of the designer with regard to optimal, cost-effective and energy-efficient lighting system in terms of installation and operating characteristics.

Mentioned document shall include but not limited to the review of internationally adopted good practice for installation of lighting columns and lighting fixtures, their type, dislocation and other technical parameters, and adaptation with geographical-climate and service conditions of Georgia.

Document shall include *technical* and *economical comparison* of international standards of Highway/Roadway lighting installation (at least 3 standards affective in post-Soviet states, Europe and USA).

Detailed designs by Lots:

Lot 2: Samtredia-Grigoleti: Lot 2 (approximate length 18.5 km) provision of design services for installation of Highway/Roadway lighting

Lot – 3: Zemo Osiauri- Chumateleti: Lot 1 & Lot 2-a (approximate length 7.8km) provision of design services for installation of Highway/Roadway lighting

Lot 4: Batumi Bypass Road: (approximate length 14.3 km) provision of design services for installation of Highway/Roadway lighting

Lot 5: provision of design services for installation of Highway/Roadway lighting at Grigoleti-Kobuleti road (approximate length 14 km)

Lot- 6: Lochini Interchange of Tbilisi-Bakurtsikhe-Lagodekhi (border of the Republic of Azerbaijan) international road and from the interchange including roundabout of Vaziani Military Base; Vaziani-Gombori-Telavi secondary road junction (km27); entrance of Sartichala village (km33+700m and exit 34+300m); Khashmi village junction (km36+500m); Village

Patardzeuli junction (km39+750m); Davit Gareji junction (km51+600m); Bakurtsike interchange (km103+800m); (approximate length 8.1 km) provision of design services for installation of Highway/Roadway lighting;

Lot – 7: provision of design services for installation of Highway/Roadway lighting at Tsikhisdziri-Shavshvebi (km46+km71) section of Tbilisi-Senaki-Leselidze (border of Russian Federation) international road (approximate length 25 km) (left direction)

Lot – 8: provision of design services for installation of Highway/Roadway lighting at road interchanges located along Tbilisi-Gori section of Tbilisi-Senaki-Leselidze (border of Russian Federation) international road (Zahesi–km19-km20; Tsitsamuri–km22; Tsitsamuri ravine (Saguramo)–km24-km25; Aragvi–km26; Natakhtari–km28; Gorovani–km33; Ksani–km40; Aghaiani–km42; Okami–km51-km52; Igoeti–km56-km58; Gamdlistskaro km59-km60; Nigoza–km64; Khurvaleti–km67-km68; Shavshvebi–km71; Akhalsopeli–km75; Sveneti–km80; Mejvriskhevi–km80; Gori (Tskhinvali viaduct)–km83-km84 (approximate length 26.6 km).

Bridge crossings km19+453; km23+190; km24+060; km25+300; km28+350; km28+500; km32+320; km38+200; km39+150; km40+800; km55+400; km56+350; km79+750; km80+230; km81+200; km82+800 (approximate length 2.05 km). provision of design services for installation of Highway/Roadway lighting

Provision of design services for installation of Highway/Roadway lighting at km 248 (Bashi Akhalsopeli interchange) of (b-1) international Tbilisi-Senaki-Leselidze (border of Russian Federation) road - km31+680-km33+720 of (ö-104) secondary Kutaisi-Geguti-Sakolia- Bashi-Ianeti road– (ö204) secondary Tbilisi-Senaki-Leselidze road, km216 (Nakhshirghele interchange) - Kutaisi-Samtredia road, km34+550-km36+630 (approximate length 4.5 km)

Lot – 9: Zemo Osiauri-Chumateleti: Lot 2.b (approximate length 6.3 km) provision of design services for installation of Highway/Roadway lighting

Lot – 10: Samtredia-Grigoleti: Lot 1 (approximate length 11.5 km) Provision of design services for installation of Highway/Roadway lighting

Lot – 11: Samtredia-Grigoleti: Lot 4 (approximate length 9 km) Provision of design services for installation of Highway/Roadway lighting

Lot – 12: Samtredia-Grigoleti: Lot 3 (approximate length 12 km) Provision of design services for installation of Highway/Roadway lighting

1. 2. Main types of the services

1. Field survey and cameral works;
2. Design works (technical solutions and construction organization);
3. Preparation of cost-estimating documentation and verification of estimated price;
4. Preparation of technical documentation related to tender procedures;
5. Preparation of environmental management plan;
6. Submission of authorized 3rd party Expert Conclusion (approval) on technical documents.

1.3. If required, the Supplier shall render the following services under the total cost of the contract:

1. Make additional copies of technical documents prepared for execution of design-estimating and bidding procedures;
2. Recalculation of BoQs;
3. Design correction;
4. Plan environmental impact mitigation measures along the route;
5. Elaboration of draft Environmental Impact Assessment document;
6. Preparation of resettlement action plan;
7. Preparation of waste management plan.

1.4. Service delivery time and other conditions:

service delivery time – 12 months from the contract signature

Lot	Name of the object	Number of copies Georgian-English (printed-digital)	Time of Report Delivery from the contract signature (month)	Price of the stages (% of the contract value)
1	Initial report	6-2	1	0
2	Samtredia-Grigoleti: Lot 2 (approximate length 18.5 km) provision of design services for installation of Highway/Roadway lighting	6-2	3	12
3	Zemo Osiauri- Chumateleti: Lot 1 & Lot 2-a (approximate length 7.8km) provision of design services for installation of Highway/Roadway lighting	6-2	3	5
4	Batumi Bypass Road (approximate length 14.3 km) provision of design services for installation of Highway/Roadway lighting	6-2	5	9
5	Grigoleti-Kobuleti (approximate length 14 km) provision of design	6-2	5	9

	services for installation of Highway/Roadway lighting			
6	Lochini Interchange of Tbilisi-Bakurtsikhe-Lagodekhi (border of the Republic of Azerbaijan) international road and from the interchange including roundabout of Vaziani Military Base; Vaziani-Gombori-Telavi secondary road junction (km27); entrance of Sartichala village (km33+700m and exit 34+300m); Khashmi village junction (km36+500m); Village Patardzeuli junction (km39+750m); Davit Gareji junction (km51+600m); Bakurtsike interchange (km103+800m); (approximate length 8.1 km) provision of design services for installation of Highway/Roadway lighting;	6-2	7	5
7	provision of design services for installation of Highway/Roadway lighting at Tsikhisdziri-Shavshvebi (km46+km71) section of Tbilisi-Senaki-Leselidze (border of Russian Federation) international road (approximate length 25 km) (left direction)	6-2	7	16
8	provision of design services for installation of Highway/Roadway lighting at road interchanges located along Tbilisi-Gori section of Tbilisi-Senaki-Leselidze (border of Russian Federation) international road (Zahesi-km19-km20; Tsitsamuri-km22; Tsitsamuri ravine (Saguramo)-km24-km25; Aragvi-km26; Natakhtari-km28; Gorovani-km33; Ksani-km40; Aghaiani-km42; Okami-km51-km52; Igoeti-km56-km58; Gamdlistskaro km59-km60; Nigoza-km64; Khurvaleti-km67-km68; Shavshvebi-km71;	6-2	9	20

	<p>Akhalsopeli–km75; Sveneti–km80; Mejriskhevi–km80; Gori (Tskhinvali viaduct)–km83-km84 (approximate length 26.6 km).</p> <p>Bridge crossings km19+453; km23+190; km24+060; km25+300; km28+350; km28+500; km32+320; km38+200; km39+150; km40+800; km55+400; km56+350; km79+750; km80+230; km81+200; km82+800 (approximate length 2.05 km).</p> <p>provision of design services for installation of Highway/Roadway lighting.</p> <p>Provision of design services for installation of Highway/Roadway lighting at km 248 (Bashi Akhalsopeli interchange) of (b-1)) international Tbilisi-Senaki-Leselidze (border of Russian Federation) road - km31+680-km33+720 of (ø-104) secondary Kutaisi-Geguti-Sakolia- Bashi-Ianeti road– (ø204) secondary Tbilisi-Senaki-Leselidze road, km216 (Nakhshirghele interchange) - Kutaisi-Samtredia road, km34+550-km36+630 (approximate length4.5 km)</p>			
9	<p>Zemo Osiauri-Chumateleti: Lot 2.b (approximate length 6.3 km)</p> <p>Provision of design services for installation of Highway/Roadway lighting</p>	6-2	11	4
10	<p>Samtredia-Grigoleti: Lot 1 (approximate length 11.5 km)</p> <p>Provision of design services for installation of Highway/Roadway lighting</p>	6-2	11	7
11	<p>Samtredia-Grigoleti: Lot 4 (approximate length 9 km)</p> <p>Provision of design services for installation of Highway/Roadway lighting</p>	6-2	11	5
12	<p>Samtredia-Grigoleti: Lot 3 (approximate length 12 km)</p> <p>Provision</p>	6-2	11	8

	of design services for installation of Highway/Roadway lighting			
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If required, adjustment of delivery time of each design is allowed based on the mutual agreement;

If completion time for preparation of design and bidding documentations for the separate objects exceed the timeframes specified by this ToR, Supplier shall proceed with the services until finalization of works (including author's supervision of separate objects) based on execution of the relevant amendment to the contract concluded between the supplier and the procurer.

If required, in agreement with the Supplier, procurer reserves the right to make amendments to the initial procurement plan; to reduce scope of the services due to the reduction of the volume of annual financing, and the Supplier shouldn't have any claim on performance of the volumes considered by the tender;

Provisions for premature termination of the contract are mentioned in contract conditions;

Sanctions considered by the contract shall be applied to the breaching party for the breach of contractual time;

Considering the procurement object, Procurer shall issue the individual design assignments in writing. Individual design assignment shall include the time and conditions for preparation of design-cost estimating documentation. Individual design assignment shall be issued according to the object to be designed individually.

2. Service conditions required for installation of Highway/Roadway lighting

All documents, elaborated during service provision, including shop drawings, textual part and technical documentation related to conducting of tender procedures, shall be submitted in **Georgian** and **English** languages.

Technical part shall review general conditions, which should be guided by the Supplier in order to elaborate high-quality design by application of available technologies accepted for the procurer.

2. 1. Scope of the services

Services to be rendered shall include field survey works, desk study of field data and designing. In this regard, Supplier shall consider the following in the design documentation:

- Description of the project section;
- Composition of lighting network;
- Electrotechnical part;
- Transformer station;
- Report on grounding circuit of complex transformer station;

- Cabling;
- Selection of cables;
- Lighting network;
- Main parameters of power transmission support and light fixtures;
- Location of metering skids;
- Installation of transmission line;
- Location of transmission line supports;
- Lighting calculation design;
- Construction organization plan shall include work schedule, which should determine approximate time of work execution;
- Supplier shall agree design documentation with the power supplier organizations and obtain from them necessary technical permit for connection to the power network;
- Cost estimating documents shall be prepared based on the input method (break down in excel file);
- If required, for execution of survey and design works, Supplier shall agree designs with concerned organizations and persons in advance;
- Design shall consider international experience gained in road sector;
- Illumination of roads shall consider application of modern light management systems and LED lights;
- Supplier shall definitely consider in the submitted design documentation maximal possible unification of technical solutions during construction and operation period for cost efficiency of the procurer;
- Design documentation shall consider reinstatement of planting/green line on median strip.

2.2. Workplace Preparation

The Supplier is responsible for providing the office space, equipment, arrangement, transport and tools and facilities required for all field work.

2.3. Traffic Regulation

The designs of the regulation of works to be performed must be implemented in accordance with the technical rules and instructions in force in Georgia required for the regulation of traffic and road works, which will be agreed with the relevant agencies.

2.4. Technical Rules and Legal Requirements

It is recommended and the supplier is obliged to be guided and use in the implementation of projects:

- Technical rules and standards in force under the legislation of Georgia and technical recommendations, manuals and instructions developed on the basis of them;

Note: In case of necessity of any different assumptions in the design norms and regulations, the issue of allowing or limiting a specific norm should be agreed with the Employer in advance.

2.5. Technical specifications for the development of design documentation required for Highway/Roadway lighting works

The design documentation shall include the construction of the power transmission line, the report of electrical loads and wire crossing, grounding of the seating, and more. Electrical equipment shall be selected in accordance with relevant standards and technical norms;

The surrounding network shall be inspected for short circuits and load currents. If necessary, the principles of relay protection should be revised and setting calculation should be made;

A new complete transformer substation must be selected. Arrangement of the foundation of the transformer substation, grounding contour, balancing electricity metering node should be considered;

For visible loadshedding, the installation of a toggle switch must be provided, as well as protection against overvoltage must be provided;

The project must include a network report. A voltage loss report must be made according to which the self propelled insulated wire is selected; Constructive, engineering and other types of solutions developed by the project organization shall be designed to take into account and comply with Georgian standards, legislation and internationally recognized tried-and-true practices. Compatibility between drawings and specifications, compliance of material list with specifications and drawings shall be ensured.

The design documentation shall include the construction of the power transmission line, the calculation of electrical loads and wire crossing, grounding of the seating, and more. Electrical equipment shall be selected in accordance with relevant standards and technical norms.

3. Field-Research Works

Based on the technical rules and standards in force for Highway/Roadway lighting in Georgia, the supplier shall determine the types of works required to be performed and their volumes from the types of works given in this chapter.

As a result of field research, the topographic, engineering-geological conditions of the site area, and other necessary information required to compile the construction organization design and cost estimate shall be obtained.

Note: Here is a non-exhaustive list of works that can be used for general research works. Therefore, construction norms and standards in force in Georgia should be used, where the methods and means of conducting research are fully given.

3.1. Engineering-Topographical Surveying Works

During the engineering-topographical surveying works, a complex of works should be performed to the extent that is necessary to obtain topographical surveying materials and data necessary for the processing of working drawings for all parts of the project, to attach separate buildings to the site and to compile local estimates of the constituent parts of the facility.

The field stage of research in the production of topographical surveying works shall include:

- a. During the process of picketage of the existing road section, which is subject to the measures required for the arrangement of Highway/Roadway lighting, drawing up a site plan of the route, setting out the route and attaching the axes of artificial structures to it;
- b. Topographical surveying tachometric surveying of the design section at a scale of 1: 1000, or 1: 500. To the extent necessary to carry out the necessary measures. The tachometric surveying of the terrain, performed at a scale of 1: 500, must be processed in the absolute UTM Geocorse coordinate system;
- c. Linking engineering-geological excavations (if any) to the route and artificial structures;
- d. Taking cross-sectional profiles at each characteristic point (wiring posts locations, etc.);
- e. Taking longitudinal profiles along the entire length of the route;
- f. If necessary, the intersection of existing communications (overhead lines, power lines, cables, water supply, sewerage network, etc.) with the design route and appropriate locations shall be determined together with the stakeholder organizations and agreed on the conditions of crossing/relocation with them.

3.2. Measurements of Existing Buildings during the Survey Works

- a. Measurements shall include communication lines, electrical and communication cable lines, high and low voltage power lines existed at the design route.
- b. Design decisions shall be agreed with the owner of the proper communications in accordance with the existing rules.

3.3. Preliminary Works of Engineering-Geological Survey

The composition and scope of engineering-geological works depend on the design stage of the research area, the complexity of engineering-geological conditions, the construction of artificial structures and their dimensions.

The results of engineering-geological research shall contain the data necessary for the selection of types of foundations of cable line posts and other artificial structures, considering possible changes of engineering-geological and hydrological conditions during construction and operation while determining indentation and dimensions.

In the absence of data on the thickness of the compacted soils at the base of the foundations, the depth of the boreholes may be determined by Table №37 Building Code (၆၆၃၁၅/СНиП)1.02.07-87 "Engineering Surveys for Construction" (or other similar document);

Reports should be made on the basis of materials obtained from engineering-geological surveys with conclusions and recommendations for ensuring the sustainability of all buildings on the cable line, with data on the supply of local construction materials and their quality.

This requires the following types of probabilistic research and laboratory works:

4. Cameral Works

- a. Highway/Roadway lighting engineering-topographic plan should be made according to the area of the shooting object in the scales of 1: 500 (in case of up to 10 ha of shooting area), 1: 1000 (in case of up to 50 ha of shooting area) and 1: 2000 (in case of more than 50 ha of shooting area). Crossings at the height of the terrain should be taken 0.5 and 1.0 m depending on the terrain and situational complexity;
- b. Aligned plan of cable lines shall be drawn at a scale of 1: 1000; 1: 500;
- c. The engineering topographic plan of the cable line layout should be made in the scale of 1: 500, the crossings at the height of the terrain should be taken 0.5 meters;
- d. Transverse profiles shall be drawn at a scale of 1: 100 in difficult terrain and in the straight places at a scale of 1: 200;
- e. The situation on the route plan and longitudinal profile shall be marked in accordance with the existing conditional signs;
- f. Drawings of artificial structures should be made in 1: 200, 1: 100, 1:50, 1:20, 1:10 and 1: 5 scales;
- g. All drawings must bear the names of the responsible and executing persons and their signatures.

When analyzing the results of surveying and measurement works carried out on the site (field), performing the necessary calculations and processing graphic text materials in the office, as well as providing the necessary agreement documents.

5. Ownership

Any studies, reports, graphics or other materials prepared in connection with this service belong to the Procurer and are his/her property in the form of open (working) files (Word, Excel, DWG, Dxf, Shp. Etc.).

The Supplier has no right to use these materials for other works without the prior consent of the Procurer.

The Supplier is obliged to provide the Procurer with the electronic version of the full volume of terms of references related to the design-cost estimate and tender procedures (Word, Excel, DWG, Dxf, Shp. Etc.).

6. Examination of technical documentation

When submitting detailed design documentation to the Employer, the supplier is obliged to submit the 3rd party expertise of detailed design documentation required for obtaining a construction permit, in accordance with the legislation of Georgia, which must be issued by an

accredited organization, or the signatories must be registered at LEPL Technical and Construction Supervision Agency.

7. Ecology and Nature Protection

- a. The rules and methods of work production shall be selected, which will ensure the maximum preservation of the existing natural conditions;
- b. Consider, if necessary, cutting fertile soil and temporarily relocating it for further use in bulk. A place shall be chosen for its use, a towing distance shall be determined;
- c. If necessary, places shall be designated for arranging the mine soil dump, the distances of the ground load to the object shall be determined;
- d. Measures for environmental protection shall be set;
- e. After the completion of the works, the temporarily occupied areas shall be recultivated (roads, construction bases, etc.);
- f. In case of overlap of right of way (buffer) of the construction section with the borders of the state forest fund, it is necessary to exclude the area from the forest fund, for this it is necessary:
 - 1) To prepare cadastral survey drawing on the relevant land plot (SHP files);
 - 2) To conduct preliminary registration of timber resources in the area to be excluded from the State Forest Fund in accordance with the legislation of Georgia;
 - 3) To submit the relevant information provided for by the legislation of Georgia in order to obtain the right to cut the Red List species (if any) in accordance with the established procedure.

8. Resettlement

In order to ensure smooth construction of the project and to reduce the scale of the project's negative impact on the local population, a Resettlement Action Plan should be developed, detailing the full compensation for the project impact, taking into account the current real situation and current market prices.

To update a land acquisition and resettlement plan, the supplier must conduct appropriate surveys according to the steps described below:

Step 1. Analyze the information provided by the supplier based on the feasibility study and develop approaches to resettlement.

Step 2. To conduct detailed measurement works in the area affected by the rehabilitation works, for identified private property, immovable property unregistered in the Public Registry and / or with incorrect cadastral data, also, to carry out detailed measurement works of the real estate arbitrarily occupied by individuals until September 20, 2007 but is in their possession at the time of the inventory, determine the status of the land plot (registered in Public Registry; Unregistered subject of legalization; Unregistered not a subject of legalization; State, etc.). In order to systematically register the affected real estate in the Public Registry, to determine the location / identity of the land plot, legal status and other circumstances relevant to the case, the supplier is obliged to draw up a Minutes of on-site inspection for each land plot, the form of which is approved by the order of the Chairman of the National Agency of Public Registry. For each

identified plot, cadastral survey drawings shall be made for the initial registration, and in case of partial acquisition, cadastral survey drawings of the land boundary, according to the original right of way, as well as cadastral survey drawings of state-owned land registration plots, which must be submitted to the Department along with the resettlement plan. In addition, cadastral measurements must be carried out and necessary drawings for registration / boundary must be prepared in accordance with the requirements set by the Resolution №388 of the Government of Georgia of August 8, 2016.

Step 3. The process of verifying / identifying the owner / user of all affected area should preferably be carried out in close cooperation and involvement with local government representatives, in consultation with them, and based on information they provide about owners-users and relevant documentation.

Step 4. An inventory / description of each plot in the affected area and the buildings / structures and plants (if any) located on it should be done using a pre-designed inventory form, in the presence of established owners / users, consulting firm (supplier) and preferably a local government representative, and with their participation (with the signature of at least two or more persons). Preparation of the measurement drawing for each building. Inventory documentation should be enclosed by photographs taken from different angles (plots of land, fence, buildings, plants, etc.) with an indication of the date recorded with a digital camera. Update old land acquisition and resettlement plan data based on information received.

Stage 5. Processing of field research / inventory material by an independent, licensed appraiser (expert) through field trips on-site verification / study of data and calculation of market value for each category of land, estimate / calculate unit as well as total cost for annual / perennial crops, plants, buildings (by cost method) calculation of buildings / structures (by cost method) as a unit as well as total value.

Stage 6. Prepare a working version of the land acquisition and resettlement plan (including a summary table and appendices prepared for each plot). Submit the working version of the plan to the Roads Department of Georgia, share comments and approve. The Supplier should also ensure that the Resettlement Action Plan is amended to address any changes / inaccuracies identified during the resettlement procedures.

Note: The Supplier is obliged to correct, clarify the identified changes / inaccuracies within 6 months after the submission of the final version of the land acquisition and resettlement plan to the Procurer (Period of implementation of the Resettlement Plan) and adjustments if necessary. Reporting to the supplier at the stage of carrying out the works the supplier is responsible for close cooperation and sharing of information with the relevant units of the Roads Department of Georgia and, if necessary, as well as with the design organization developing the road engineering project (design). Working version of land acquisition and resettlement plan shall include: summary report of working version of the resettlement plan and fieldwork (measurements, inventory, and surveys) and sample of information brochure; Minutes of public meetings, photographs, questions and answers asked by the population. Sharing / integration in the report of the remarks of the Roads Department of Georgia; Final report of the land acquisition and resettlement plan: submission of the final land acquisition and resettlement plan, submission of

the compensation table of the summary plan (which should include calculation of compensation for each land plot), presentation of the road project (full orthophoto) on which the measured plots will be marked (will be numbered sequentially, according to the direction of the project road) and right of way (buffer). Cadastral drawings, inventory forms, and socio-economic survey results shall be provided for each owner (in the form of appendices). The plan should be updated based on the comments of the Roads Department of Georgia.

Annex 1. The theoretical part of the Resettlement Action Plan should include information, with relevant chapters and subchapters:

Summary:

1. Project description
 - A. General information about the project
 - B. Impact Corridor
2. Possible impacts of the project
 - A. Summary of project impacts
 - B. Impact on the land
 - C. Impact on buildings
 - D. Impact on crops and trees
 - E. Impacts on business
 - F. Other impacts
3. Project goals and expected results
4. Legal and political basis
 - A. Laws of Georgia
5. Institutional (organizational) responsibility
6. Resettlement measures
 - A. Prepare the final version of the resettlement plan
 - B. Implement a resettlement plan
7. Evaluation methods. Loss assessment and compensation
 - A. Estimation of buildings by the cost method
 - B. Calculate the market value of a land plot by the method of comparing analogues
 - C. Methodology for calculating tree compensation
 - D. Methodology for calculating annual crop compensation
 - E. Business compensation
8. Public hearings, participation and consultation
9. Resettlement costs and budget

Appendix 1

1. Evaluation methodology
 2. Legalization procedure
 3. Information brochure
- Information regarding public hearings.

9. Basic technical decisions of the Supplier shall be agreed with the Procurer.

