**ANNOUNCEMENT**

**ON THE PREQUALIFICATION PROCEDURE**

This text of the announcement is approved by the decision N 1 dated November 15, 2024 of the open competition pre-qualification procurement procedure evaluation committee and is published

according to Article 24 of the RA Law "On Purchases"

Procedure code: ԲԷՑ-ՆԸ-ԲՄԽԾՁԲ-24/03

**I. CHARACTERISTICS OF THE PURCHASE SUBJECT**

1. The Employer- «High Voltage Electric Networks» CJSC by the address building 1, Z. Andranik str c.Yerevan announces a pre-qualification procedure for the purpose of determining the possible participants of the open tender to be organized for the acquisition of **linear infrastructures mapping and measuring services.**

**A brief version** of the technical description is attached./ Appendix 3/

**II. TERMS OF CURRENT PROCEDURE PARTICIPATION**

1. According to Article 7 of “Law on Procurements” of the Republic of Armenia, any person regardless of being a foreign person, organization or stateless person has equal right to participate in this procedure.

3. The participant who wants to participate in the pre-qualification procedure must meet the requirements set by Article 6, Part 3 of the RA " Law On Procurement". For the performance of obligations under the Contract the Participant must have the required as follows:

1) «Correspondence of professional activity to the activity provided for in the Contract»,

2) «Professional experience»,

3) «Technical facility»,

4) «Labor resources»:

1) In order to certify its compliance with the qualification criteria of **«Correspondence of professional activity to the activity provided for in the Contract»**, the Participant must have properly implemented at least one such Contract during the year of application and the three years preceding it. A previously executed Contract (or Contracts) is (or are) valued similarly, if the scope of service provided within it (them) (or the total scope) in monetary terms is not less than 41 833 400 (forty one million eight hundred thirty three thousand four hundred) AMD /Appendix 2/ **Moreover, within the framework of this procedure, properly executed contracts for the provision of mapping and/or mining and/or measurement services are considered similar**.

**2)** In order to certify its compliance with the qualification criteria of **«Professional experience»** the Participant submits copies of the previous Contract(s) and in order to evaluate the proper execution of that Contract (Contracts), a copy of the Act (handover-acceptance Protocol, etc.) approved by the Parties of the given Contract, certifying the performance of the Contract within the specified period or the written certification of the Party accepting the execution of the given Contract /attached to Appendix 2/

**3) The «Technical facility» criterion is evaluated in the following order**:

As a document justifying the qualification criteria, the Participant presents the data of the technical facility that the latter plans to use during the performance of the Contract. Moreover, in order to substantiate the availability of technical facility, the Participant submits copies of their technical passports and documents confirming the ownership or rights of temporary use of the Participant over these facilities. Data on technical facilities are presented in the following form:

|  |  |  |  |
| --- | --- | --- | --- |
| N | The name of the technical facilities | Type, license plate (if available) and year of manufacture of the technical facilities | Type of right to technical facilities |
| 1 |  |  |  |
| 2 |  |  |  |

The technical s required for the performance of the Contract are the following:

|  |  |  |
| --- | --- | --- |
| N | The name of the technical facility | Quantity required |
| 1 | Electronic tacheometer | 2 |
| 2 | Satellite positioning (GPS) receiver | 4 |
| 3 | Dron for aerial photography | 2 |

For the technical facilitys mentioned in items 1-2 of the Table, the Participant must also submit an up-to-date calibration certificate.

The Participant is considered to meet the qualification criteria provided for in this sub-clause, if the laller has submitted the information required in the application.

**3) «Labor resources»** **criterion is evaluated in the following order**:

Labor resources with the following qualifications are required for the execution of the Contract

|  |  |  |  |
| --- | --- | --- | --- |
| N | Personnel | Number  (person) | Work experience (at least year) |
| 1 | surveyor | 4 | 3 |
| 2 | cartographer | 3 | 1 |

the Participant submits the data on the staff proposed for the execution of the Contract as a document justifying the qualification criteria in the following form

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Specialists included in the main staff | | | | |
| Firs name, last name | Qualification | Work experience | | Name of the Employer |
| Period | The field of activity and the work performed |
| 1 | 2 | 3 | 4 | 5 |
|  |  |  |  |  |
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|  |  |  |  |  |
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Moreover, the Participant in order to justify the availability of working resources:

* presents the written consents of the specialists involved in the nominated staff about involving the them in the works to be carried out, as well as copies of passports of specialists, documents certifying qualification (diploma, certificates, etc.), documents certifying (substantiating) work experience (emploiment record book or digital version of emploiment record book or individual account statement or relevant reference issued by the Employer), qualification certificates issued by the state authorized body.

The Participant is considered to meet the qualification criteria provided for in this sub-clause, if it has submitted the required information in the application:

**The Participant must meet the minimum requirements set forth in this invitation.**

**Failure to meet any of the above criteria will result to rejection of the Participant's Bid.**

**The selected Consultant is determined from the submitted Bids by the method of selection of the Bid meeting the non-price minimum conditions, which is assesed and offered the lowest price provided by the invitation.**

4. Participants can participate in the pre-qualification procedure in the form of Joint Venture (Consortium). In that case:

1) the pre-qualification Bid also includes a Joint Venture Contract,

2) the joint qualifications of all members of the Joint Venture Contract are taken into account during the evaluation of the pre-qualification Bid (the qualification of each member of the Joint Venture Contract must meet the qualification requirements defined in this Announcement, related to the given member under this Contract),

3) participants are jointly liable,

4) the party (parties) of the Joint Venture Contract are not allowed to submit separate Bid (Bids) to the same procedure.

5) in case of withdrawal of the consortium member from the consortium, the Contract signed by the Employer with the consortium is unilaterally terminated and the measures of liability provided by the Contract are applied to the consortium members.

**III. THE PROCEDURE FOR OBTAINING CLARIFICATION AND MAKING CHANGES TO THE ANNOUNCEMENT**

5. The Participant has the right to request in writing an clarification of the pre-qualification Announcent at least five calendar days before the deadline for submitting of pre-qualification Bids. The clarification shall be provided in writing to the requesting Participant within two calendar days following the date of receipt of the request. In case of providing information of any Participant, the Employer must ensure the availability of that information for all potential Participants.

In case the request mentioned in this point is submitted via e-mail, the Participant sends the printed version of the original letter to the e-mail address of the secretary of the commission **(**[**narine.kirakosyan@hven.am**](mailto:narine.kirakosyan@hven.am)**).**

In case the request is submitted via e-mail, the printed version of the letter regarding its clarification should be sent from the e-mail of the secretary of the commission provided in this Announcent, by sending to the e-mail address provided the participant's request.

6. The statement about the content of the request and clarifications is published in the bulletin on the day of providing the clarification, without specifying the data of the Participant who made the request.

7. Clarification is not provided if the request was made in violation of the term established by this section, as well as if the request is outside the scope of the content of this statement. Moreover, the Participant is notified in writing about the reasons for not providing the clarification within two calendar days following the day of receiving the request.:

8. Changes may be made to this Announcement at least two calendar days before the deadline for submission of Bids. On the first working day following the day of making the change, the secretary of the commission publishes the announcement about making the change in the bulletin.

9. In case of changes in the pre-qualification Announcement, the deadline for submitting pre-qualification Bids is calculated from the date of publication of the Announcement in the bulletin about these changes.

**IV. PROCEDURE FOR SUBMITTING OF PRE-QUALIFICATION BID**

10. To participate in this procedure, the Participant submits the Bid to the commission.

11. The Participant can submit the pre-qualification Bid to the commission by:

1) electronically by sending to the e-mail address of the commission secretary ([narine.kirakosyan@hven.am](mailto:narine.kirakosyan@hven.am) ) provided for in this Announcement

2) in documentary form with a sealed envelope, glued. On the envelope by the language of the pre-qualification Bid is indicated the following:

a. the name of the employer and the locatrion of submission of the Bid (address),

b. procedure code,

c. the words "not to open until the bid opening session",

d. Participant's name, location and phone number.

12. Bids for the procedure must be submitted to the commission no later than 11:00 a.m. on the 14th day (29.11.2024) from the date of publication of this Announcement in the bulletin.

It is necessary to submit pre-qualification Bids submitted in documentary form to the commission before the deadline set by this point expires by the address: building 1, Z. Andranik str c.Yerevan.

13. The pre-qualification Bids submitted in documentary form are received and registered in the register of applications by the secretary of the commission.

The Bids are registered by the secretary in the register according to the order of their receipt, indicating the registration number, day and time in the register. At the request of the Participant, a reference is issued on the subject. Bids submitted after the deadline for submission of Bids are not registered in the register and they are returned by the secretary within two working days following the date of receipt.

14. The Participant submits the following by the pre-qualification Bid:

1) a written Application Announcement to participate in the pre-qualification procedure approved by the Participant in accordance with Appendix No. 1,

2) a statement certified by the Participant as to its compliance with the requirements of the qualification criteria set forth in this Announcement in accordance with Appendix 2,

3) a copy of the Joint Venture Contract, if the Participants participate in this procedure as a Joint Venture (Consortium).

4) the documents mentioned in this Announcement:

15. If the prequalification Bid is submitted by the Participant:

1) documentary way, then all the documents to be included in the Bid, except for the document specified in sub-paragraph 3) of Clause 14 of this Announcement and the documents not approved by him (for example, diplomas, certificates, contracts, etc.), are submitted in original and four copies. The words "original" and "copy" are written on the packages of documents respectively. Instead of original documents, notarized copies may be submitted.

2) electronically way, then printed (scanned) versions of the original documents are presented.

**16. The documents included in the pre-qualification Bids, approved by the Participant, must be submitted in the Armenian language. In addition to Armenian, Bids can also be submitted in English or Russian.**

17. The envelope and the documents prepared by the Participant under this Announcement are signed by the person presenting them or the latter's authorized person (hereinafter referred to as the agent). If the pre-qualification Bid is submitted by the agent, then a document stating that the latter has been given this authority is submitted with the Bid. In case of expediency, the Participant can present the required information in other ways than those proposed by this Announcement, keeping the required validity conditions.

**V. PREQUALIFICATION BIDS OPENING, EVALUATION AND**

**SUMMARY OF RESULTS**

18. Opening, evaluation and summary of results of pre-qualification bids is done at the opening and evaluation session of pre-qualification bids, which starts at 11:00 on the 14th day (29.11.2024) from the date of publication of this announcement in the bulletin, at c. Yerevan Z. Andranik str. 1 address.

At the same time, the evaluation of bids is carried out within three working days from the date of the deadline for submission of bids.

19. Opening and evaluation session of pre-qualification bids

1) the secretary of the commission provides information about the entries made in the register and transfers to the chairman of the commission the register of bids, other documents that are an integral part of it, registered and (or) electronically submitted bids;

2) after the documents specified in sub-article 1 of this clause are transferred to the chairman (chairman of the session), the commission evaluates:

a. Compliance of formating and submission of envelopes containing bids according to the established procedure and opening the complying evaluated bids;

b. availability of required (intended) documents in each opened envelope and their conformity, as well as the preparation of electronically submitted documents, to the valid terms and conditions defined by this announcment;

20. Bids that meet the conditions set forth in this announcement are considered risponsive. Otherwise, pre-qualification bids are evaluated as non-responsive and being rejected.

If, as a result of the evaluation conducted during the opening session of pre-qualification bids, inconsistencies are recorded in the participant's bids towards the requirements of this announcement, the commission suspends the session for one working day, and the secretary of the commission notifies the participant electronically on the same day, offering to rectify the discrepancy before the end of the suspension period. Moreover, mentioned in this item:

1) the inconsistencies recorded must be described in detail in the proposal;

2) the proposal is sent to the participant by sending it from the e-mail address of the secretary to the e-mail address specified in the participant's application.

21. If the participant rectifies the recorded inconsistency within the period specified by the item 20 of this announcment, then the latter's application is considered responsive. Otherwise, the Bid is evaluated as non-responsive and being rejected. The participant submits the rectified documents from the e-mail specified in the application to participate in this procedure by sending them to the e-mail of the secretary of the commission, as specified in this announcement.

22. A member of the commission or the secretary cannot participate in the work of the commission, if during the commission's activity it turns out that the organization founded by them or in which they have a share (share), or a person related to them by close kinship or in-laws (parent, spouse, child, brother, sister, grandmother, grandfather, grandson, as well as the parent, child, brother, sister, grandmother, grandfather, grandson of the spouse) or the organization founded by that person or having a share (share) submitted an application to participate in this procedure. If the condition provided for in this item is met, the commission member or secretary who has a conflict of interest in relation to this procedure shall immediately announce on withdraw from this procedure.

23. A protocol is drawn up on the opening of bids, evaluation and summarization of results, which also approves the list of pre-qualified participants. The secretary of the commission on the working day following the end of the bids session:

1) publishes in the bulletin the printed (scanned) versions of the annoncments about the absence of conflict of interest signed by him and the commission members present at the bid opening session;

2) notifies the participants who submitted bids evaluated as non-responsive to the conditions provided for in this announcement about the grounds for rejection of the pre-qualification bids.

24. for the purpose of purchasing consulting services, the right to participate in the open tender process is given to the pre-qualified participants, to whom the 2nd stage invitation is also provided in electronic form together with the protocol prepared by the evaluation commssion on the summary of the results of the pre-qualification **procedure.**

25. The appeal regarding this procedure is carried out in accordance with the RA Law "On Procurement" and the RA Civil Procedure Code.

Moreover, each

1) an interested person has the right to appeal the actions (failure to act) and decisions of the Employer, the evaluation commission in accordance with the procedure established by the Civil Procedure Code of the Republic of Armenia;

2) anyone has the right to appeal the requirements of this announcement before the deadline for submission of applications in accordance with the procedure established by the Civil Procedure Code of the Republic of Armenia.

The rates of state fees charged for appeals are defined by the Law "On State Fees".

In addition to this announcement.

For additional information related to this announcement, you can contact the secretary of the commission, Narine Kirakosyan.

Tel.: +37460 380 040 (ext. 1540)

E. mail: [narine.kirakosyan@hven.am](mailto:narine.kirakosyan@hven.am)

Employer –“High Voltage Electric Networks” CJSC

Appendix N 1

Procedure announcment for the

pre-qualification of the open tender with the code

ԲԷՑ-ՆԸ-ԲՄԽԾՁԲ-24/03

**APPLICATION ANNOUNCEMENT**

**to participate in the pre-qualification procedure**

------------------------------------------------------------- expresses his desire to participate

participant name

in the open tender organized by “HIGH VOLTAGE ELECTRIC NETWORKS" CJS COMPANY under the code ԲԷՑ-ՆԸ-ԲՄԽԾՁԲ-24/03 and submits the Bid in accordance with the pre-qualification procedure and pre-qualification Announcement requirements.

the taxpayer's registration number is:

participant name taxpayer registration number

the e-mail address is: .

participant name e-mail address

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_  name of the participant (position of manager, first name and last name)  signature

L.S.

Appendix N 2

Procedure announcment for the

pre-qualification of the open tender with the code

ԲԷՑ-ՆԸ-ԲՄԽԾՁԲ-24/03

**ANNOUNCEMENT**

**About compliance with the qualification criteria provided by the pre-qualification statement with the code "ԲԷՑ-ՆԸ-ԲՄԽԾՁԲ-24/03"**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ declares and assures that it satisfies

participant name

To the requirements of the qualification criteria provided by the pre-qualification Announcement under the code " ԲԷՑ-ՆԸ-ԲՄԽԾՁԲ-24/03" and submits:

1. Scanned versions, copies of previously executed contract(s).

2. Documents justifying the availability of labor resources

3. Documents justifying the availability of technical facilities

declares and assures that during the year of submitting the

participant name

Bid and the three years preceding it, he has provided the following services:

|  |  |  |
| --- | --- | --- |
| Contracts duly executed during the year of submitting the pre-qualification Bid and the three years preceding it | | |
| N | the subject | Employer and its contact details |
| The year............ date | | |
| 1 |  |  |
| 2 |  |  |
| ... |  |  |
| The year............ date | | |
| 1 |  |  |
| 2 |  |  |
| ... |  |  |
| The year............ date | | |
| 1 |  |  |
| 2 |  |  |
| ... |  |  |

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name of the participant (position of manager, first name and last name) signature

L.S.

Appendix N 3

Procedure announcment for the

pre-qualification of the open tender with the code

ԲԷՑ-ՆԸ-ԲՄԽԾՁԲ-24/03

**TERMS OF REFERENCE**

**OF WORKS ON THE IMPLEMENTATION OF THE PROGRAM, IN ACCORDANCE WITH THE REQUIREMENTS OF THE GEOINFORMATION SYSTEM SURVEYING OF A CARTOGRAPHIC BASE WITH INTEGRATION OF DIGITAL AND INFORMATION TECHNOLOGIES FOR THE OVERHER TRANSMISSION LINES UNDER VOLTAGE 220-110 KV OF «HIGH VOLTAGE ELECTRIC NETWORKS» CJS COMPANY**

**1.** **OBJECTIVE OF WORK**

It is essential to have a digital, systematized database for the operational development of energy infrastructures, to ensure maximum accuracy and operational management. Information technologies are an integrated means of gathering comprehensive information for the efficient design of these infrastructures, analyzing the graphical support functions of distributed objects and graphical visualization of various spatial information and for online analysis of digital data. Those energy companies which have a large infrastructure distribution area are the main users of geo-information technology around the world.

Works for surveying, digitalization, creating a database and creating a cartographic basis for overhead power lines with a voltage of 220-110 kV overhead lines (hereinafter OHL) under the management of “High Voltage Electric Networks” CJSC (hereinafter – the Company) of the RA Ministry of Territorial Administration and Infrastructure, in accordance with the requirements of the geographic information system, with the implementation of information technologies should be carried out within the framework of the current legal and regulatory documents.

The usage of geographic information system technologies in the management of energy facilities makes it possible to easily and quickly perform various types of spatial and mathematical analysis, cartographic works, data classification, which previously would have required more time, human factor, finances, etc.

The information base of the geographic information system is created based on aerial photography, digital topography, cadastral plans and maps in unified coordinate-altitude systems, which display the actual image of the terrain in a given period of time. Digitalization of energy infrastructures contributes to increased utilization, efficiency and energy security. Application of innovative technologies in the management system, systematization of digitalization processes, creation of unified standards and digital environment, usage of digital technologies, will contribute to the effective management of the Company.

Geoinformation elements (linear infrastructures, substations), which are under the Company's management and are the object of survey works under this technical assignment, are: 220kV OHLs with a length of about 1528.0 km and about 4007 towers; Lalvar-Noemberyan 110kV OHL - 51.5 km with 98 towers; 10kV OHL - 7.0 km with 131 towers; Lori-1 wind power plant with 4 units and 10kV switchyard; 220kV substations - 14 and 110kV substations -2.

**2. LEGAL BASIS FOR THE DEVELOPMENT OF THE TERMS OF REFERENCE**

The basis for carrying out the work was:

* Decision No. 197-Ն of January 20, 2005, approved by the Government of the Republic of Armenia on “Concept of creation and maintenance of the geoinformation system of the Republic of Armenia”.
* Decision No. 86-Ն of January 16, 2014, of the Government of the Republic of Armenia “On the provision of information on newly developed spatial data and objects containing topographic elements of the Republic of Armenia”.
* Law on geodetic and cartographic activities of the Republic of Armenia.
* Decision No. 183-Լ of February 11, 2021, of the Government of the Republic of Armenia “On approval of the digitalization strategy of Armenia, the program of strategic measures and performance indicators”.
* Decision No. 505-Ա of April 08, 2021, of the Government of the Republic of Armenia “On approval of the strategic program for the creation of an integrated cadastre”.
* Decision No. 1569-Ն dated October 6, 2022, of the Government of the Republic of Armenia “On approval of the list of basic and thematic spatial data in the national spatial data infrastructure in the Republic of Armenia and guidelines for their standardization”.
* Law of the Republic of Armenia “On spatial data”.
* Order of the Head of the Cadastre Committee No. 75-Ն dated April 08, 2021.

**3. ENVISAGED WORKS**

The implementation of the works shall be guided in accordance with the requirements of: Decision N 183-Լ dated February 11, 2021 of the Government of the Republic of Armenia “On Approval of the Strategy of Digitalization of Armenia, Strategic Action Program and Result Indicators”; Decision N 505-Լ dated April 08, 2021 of the Government of the Republic of Armenia “On Approval of the Strategic Program of Creation of Integrated Cadastre” of the Government of the Republic of Armenia “On Approval of the Strategic Program for Creation of Integrated Cadastre”; Order N 51-Ն of February 28, 2009 approved by the Chairman of the State Committee for Real Estate Cadastre under the Government of the Republic of Armenia “Implementation of Cadastral Cartographic Works”; Decision N 197-Ն dated January 20, 2005 approved by the Government of the Republic of Armenia “Concept of Creation and Maintenance of Geoinformation System of the Republic of Armenia” and Decision N 86-Ն dated January 16, 2014 of the Government of the Republic of Armenia “On Providing Information on Newly Developed Spatial Data and Objects Containing Topographic Elements of the Republic of Armenia”; Decision N 1569-Ն dated October 06, 2022 of the Government of the Republic of Armenia “On Approving the List of Spatial Data and Objects Containing Topographic Elements of the Republic of Armenia”. Government of the Republic of Armenia “On approval of the list of basic and thematic spatial data in the national spatial data infrastructure in the Republic of Armenia and guidelines for their standardization”; Order N75-Ն.

In order to create a geoinformation system of OTLs, it is necessary to:

1. Implementation of field works:

* Safety zones defined for overhead power lines (for 220 kV overhead power lines, 25 m from the outer wires is defined, and for 110 kV overhead power lines, 20 m from the outer wires is defined) and aerial photography of substations using an unmanned aerial vehicle, creation of orthophoto plans (with a resolution of 5–10 cm).
* Field decoding (topographic survey).
* Determination of the location (boundaries) of towers and substations using satellite positioning receivers (GPS) and/or an electronic theodolite.

1. Carrying out digital cartographic work.
2. Office decoding of orthophoto plans.

* Creation of a digital map of power lines, towers and substations based on field survey data.
* Digitization of the safety zone established for overhead power lines.

1. Creation of an information database of a geographic information system.

* Creation and classification of layers required for a geographic information system.
* input of collected attribute data.
* Creation of characteristics and high-quality photo images of towers, substations.

1. Work on the implementation of the software system.
2. Compilation of measurement packages for the purpose of state registration of rights to overhead power lines (substations have a certificate of state ownership).
3. Implementation of state registration of rights to overhead power lines.
4. Implementation of field works:

* Mapping of the safety zone defined for the overhead power line.

Prior to the survey work it is necessary to collect and study the plans of cartographic materials of the envisaged area. Then construct the spatial ranges of the safety zone established for overhead power lines, and then carry out the survey work of the envisioned area. Works on creation of spatial ranges of the security zone shall be carried out in accordance with the requirements of the Resolution N 523-Ն dated April 13, 2023 “Chapter 4 ‘Security zones of electric networks with voltage above 1000 V’ of the Rules for ensuring security zones of electric networks”.

* **Aerial photography of substations using unmanned aerial vehicles.**

Conduct optical and aerial photography of substations using unmanned aerial vehicles, the resolution of the obtained orthophotos should be 5-10 cm. The root-mean-square value of the geometric deviation of orthophoto plan lines should not exceed 20–30 cm.

* Decoding of field orthophoto plans (topographic survey)

Topographic survey – decoding of field orthophoto plans can be carried out using the following methods:

1) tacheometric (using an electronic tacheometer).

2) using satellite positioning receivers (GPS).

During topographic survey and interpretation of field orthophoto plans, the following objects characterizing the terrain are subject to survey buildings, structures, road network, railways, water channels, rivers, lakes and other spatial objects. To perform the survey, it is necessary to create a survey densification network that densifies the geodetic plan and elevation base. The maximum error of the planned position of the survey base points in relation to the points of the geodetic compaction network should not exceed 0.2 mm of the plan scale.

Geodetic survey work in populated areas must be carried out at a scale of 1:500, where the deviation (error) of the compaction network points must not exceed 0.2 mm (0.10 m) from the scale of the plan, and the difference in relief horizons must be 1 m.

Geodetic survey work outside of populated areas should be carried out at a scale of 1:2000, where the deviation (error) of the compaction network points should not exceed 0.2 mm (0.4 m), and the difference in relief horizons should be 1 m.

When surveying a topographic and cartographic base, it is necessary to: survey the relief; road network, structures adjacent to the road network (bridge, overpass, tunnel); railway tracks, structures adjacent to railway tracks (bridge, overpass, tunnel); hydraulic structures and constructions, hydrography, power line infrastructure, buildings and structures and other objects located on the ground.

In built-up areas, surveying should be carried out with an accuracy of up to 0.4 m at a scale of 1:2000.

**2) Digital cartographic works**

The input and digitization of graphic data about the photographed and surveyed territory is carried out on the basis of field survey and aerial photography data. To create digital (electronic) maps, it is necessary to digitize orthophoto plans and enter terrain survey data from an electronic theodolite or from satellite positioning receivers (GPS).

Work on creating digital (electronic) maps must be carried out through constant monitoring of workers, checking maps during the work process, and also through checking the quality of the completed work.

When entering and digitizing cadastral and topographic maps, preparatory work is carried out, during which the quality of the materials serving as the basis for creating digital maps must be checked, during which field survey materials are entered, field survey data obtained using electronic tacheometers and satellite positioning receivers (if the work was carried out using electronic methods), tablets (if the work was carried out using traditional methods), as well as graphic data of measurements of newly formed real estate (length, width, distance from any clearly defined object). The data from the electronic theodolite and satellite positioning station measurements, as well as aerial photography data, are entered into the computer from a memory card or internal memory via an interface.

When compiling digital (electronic) maps, the following must be ensured:

a) full and correct use of cartographic materials,

b) ensuring the necessary accuracy when depicting objects and elements on a terrain map,

c) correct selection of objects on the orthophoto plan and generalization of images, display of main lines and typical specific features of the terrain, clear separation of images of main objects and orientations,

d) correct use of symbols and fonts,

d) reliable and correct display of toponyms, as well as quantitative and qualitative characteristics of objects on the map,

e) coordination of the content of the map being created with the content of published topographic maps of adjacent scales,

f) legibility of images and inscriptions of objects and terrain elements, clear separation of images of main objects and orientations,

It is necessary to create a cartographic basis for a geographic information system in the national geodesy coordinate system WGS-84 (WGS-84) (ARMREF 02).

**3) Creation of an information base of the geographic information system**

The cartographic base created in electronic form for the geographic information system must be in the .shp (shape) and .gdb (gdb) formats.

When creating a digital topographic base of the geoinformation system of power transmission lines and substations, the following activities must also be carried out:

* connection of layers of the cartographic base with the database,
* connection of layers (foundation) of towers with the recorded database,
* selection of symbols for the cartographic base of layers,
* clarification of the plan for the graphic representation of infrastructures,
* entering information and connecting it to a characteristic map layer.

**• creation and classification of the necessary layers of the geographic information system.**

The database of the geographic information system of substations and 220 kV power lines, as well as their infrastructures, must have a graphical and text classifier.

The database must contain the following text/attribute information:

1. brief information about power transmission lines (dispatch name, affiliation, operating organization, number of wire circuits, voltage type, wire type, year of construction),

2. brief information about the towers (intended purpose, dispatch name, affiliation, operating organization, serial numbering, type, towers base design, relative towers height, number of crossbars, relative height of the lower crossbar,

The following types of towers should be used in the overhead power line database:

а) Intermediate: which are installed on a straight section of the overhead power line route,

b) Anchor: which are installed to limit the anchor span, as well as in places where the quantity, brand and cross-section of overhead power line wires change,

c) Corner: which are installed at the point where the direction of the overhead power line changes,

d) End: which are installed at the beginning and end of the overhead power line route, as well as in places that limit cable inserts,

e) Tapping towers on which overhead power lines are branched.

The database of overhead power line towers also includes:

• Graphic schematic representations of towers.

• Digital photographs.

• Creation of classifiers of conventional signs.

Elements entered into the database must provide characteristics of the object (surface, linear, point) indicated on the map.

The main part of the information base of the geographic information system are cartographic layers, which are created in accordance with the requirements of digital topographic, cadastral plans and maps.

In order to classify cartographic layers, it is necessary to create the following main groups:

* administrative boundaries,
* buildings, structures,
* power transmission lines (ground),
* towers,
* relief,
* hydraulic structures and constructions;
* resolutions,
* railway tracks and structures adjacent to the railway,
* road network and adjacent structures,
* hydrography, etc.

• **input of attribute and cartographic data of spatial objects collected in the field,**

Field surveys and collected data must be entered into the database taking into account the requirements of the created classifier.

The database includes information on the following spatial objects in the territories of the overhead power line and substation.

1. units of administrative-territorial division, including the borders of the Republic of Armenia, its regions, communities and settlements,

2. objects of cadastral units that are registered in the database of the authorized body,

3. capital construction projects (buildings, structures) with address information, with linear structures of state, regional (oblast) and municipal significance (road and railway networks, pipelines, electrical networks, etc.),

4. forest land objects and spatial units,

5. water resources,

6. road network objects,

7. specially protected natural areas: nature reserves, sanctuaries, national parks, natural monuments and arboretums,

8. systems of territories of specially protected immovable historical and cultural monuments and their protected zones,

9. lines of regulation of urban development,

10. terrain (digital elevation model),

11. naming of geographical objects,

12. landscape complexes.

4) Works related to creation and implementation of the Company's software system.

The availability of the Company's online electronic services is relatively low, and the use of IT resources is limited and uncoordinated, which reduces the efficiency and speed of management. Creation of database is a key component in managing both IT resources and ensuring the continuity of delivery of e-service programs. A single technology platform will provide backup, archiving, etc., thanks to which as well to the implementation of the database of the geographic information system of power transmission lines, sufficient preconditions for further development will be created.

The system should have the following functions:

1.The system shall contain a database of information content about power lines that can be controlled.

2. Interaction with the user. Users should be able to search the portal for geographic toponyms, transmission towers, overhead lines, substations and other spatial information and find them after completing a query.

3. Access to the electronic system must have mechanisms for authentication, identification and encryption of the individual based on international standards.

4. In order to ensure interaction with the National Geoportal, the System must be able to use data exchange standards OGC (WMS, WFS, WCS).

5) Preparation of measurement packages for the purpose of state registration of rights over the OHLs. Execution of state registration of rights over the OHLs.

For the purposes of state registration of rights to OHLs, it is necessary to prepare measurement packages indicating the length, number of wires, name, zone area and coordinates, based on Order No. 75-Ն dated April 8, 2021.

**4. REQUIREMENTS TO THE PARTICIPANT**

The organization performing the work (services) must have the qualifications of: cartographer, surveyor, measurer (recorder), land surveyor, issued by the state authorized body.

The organization performing the work (services) is obliged to purchase all source data necessary for the execution of the work specified in the terms of reference, at its own expense and with its own funds.

**5. DOCUMENTARY MATERIALS PROVIDED AFTER COMPLETION OF THE WORK**

Upon completion of the work must be provided:

* Created cartographic basis and database for the geoinformation system of OHLs and substations territories (spatial zone of the route) in electronic form.
* Measurement packages for the purposes of state registration of the right to OHLs.
* Certificates of state registration of the right to OHLs.
* Portal for spatial data management.
* Technical Report.
* **The work or part there of shall be deemed completed from the moment of issuance of the certificate of state registration and access to it by the Employer in the server cartographic software packages.**

Payments related to the state registration of the right (state duty, service fee) shall be made by the Employer.