Part 1 – General Requirements:

Technical requirements and Specifications

Balance of Plant for:

Construction of BESS Field

Project: Glodeni BESS

Country: Romania

2025

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Contents

1. Introduction

The Providers confirms making himself familiar with the local conditions and the planning stage.

Within his scope of services, the Providers shall implement works, which is, without restrictions, functional as well as completely ready for operation part of the BESS. In this context, he shall provide any and all services and perform any and all works necessary to achieve successful performance in accordance with the Conditions of Contract.

The work includes design, engineering, procurement (part of the Providers's delivery), fabrication, testing, delivery (part of the Providers's delivery), transporting, execution of construction works, maintenance, testing at site, commissioning, and putting into operation where it's applicable.

Three design stages shall be considered during the entire Project implementation BESS field (the entire volume within the boundaries of land plots and access roads outside the land plots):

1. **"**Documentația Tehnică pentru Autorizația de Construire" (DTAC) design stage **(not a part of this scope)** are given to the Providers (Schedule 8 of the contract);
2. "Proiect Tehnic" (PT) design stage (included in this scope for all design services);
3. "Detalii de Execuție" (DE) design stage (included in this scope for all design services).

The BoP design and construction services for the Project are divided in 2 parts, comprising:

Part 1 BESS fields:

Design (Proiect Tehnic (PT) and Detalii de Execuție) (DE). Installation, assembling of all BESS equipment and systems.

Complete installation of BESS: foundation, construction, control, data collection, auxiliary systems for the battery system, PCS&MV Power Station etc. Commutation of all the networks – Data networks, Auxiliary AC 0.4 kV grid, DC 1500 V cables, MV AC 33 kV cables. Lighting protection and earthing.

Part 2: BESS Preparatory Works:

Design (Proiect Tehnic (PT) and Detalii de Execuție) (DE). Construction of the site fencing, internal and external access roads and site area surface planning, drainage system.

Full range: land planning, construction of access roads, construction of internal site roads, construction of the service roads, construction of drainage system.

It is understood that the Providers has visited the site and has satisfied himself as to the nature and conditions of terrain; climatic and geological conditions; transportation, interconnection and communication facilities; the requirements and availability of labour, water, electric power and roads; the location and condition of material sources for use in the Works; and other factors that may affect the cost estimate and execution of the Works.

2. General and Site Data

2.1 Geographical Location

The Project GLODENI BESS is located on Glodeni outskirts, Glodeni commune, Mureș County, Transylvania, Romania (46.655513, 24.596842).

It is situated at the western border of Glodeni.

Fig. 2-1: Location of GLODENI BESS

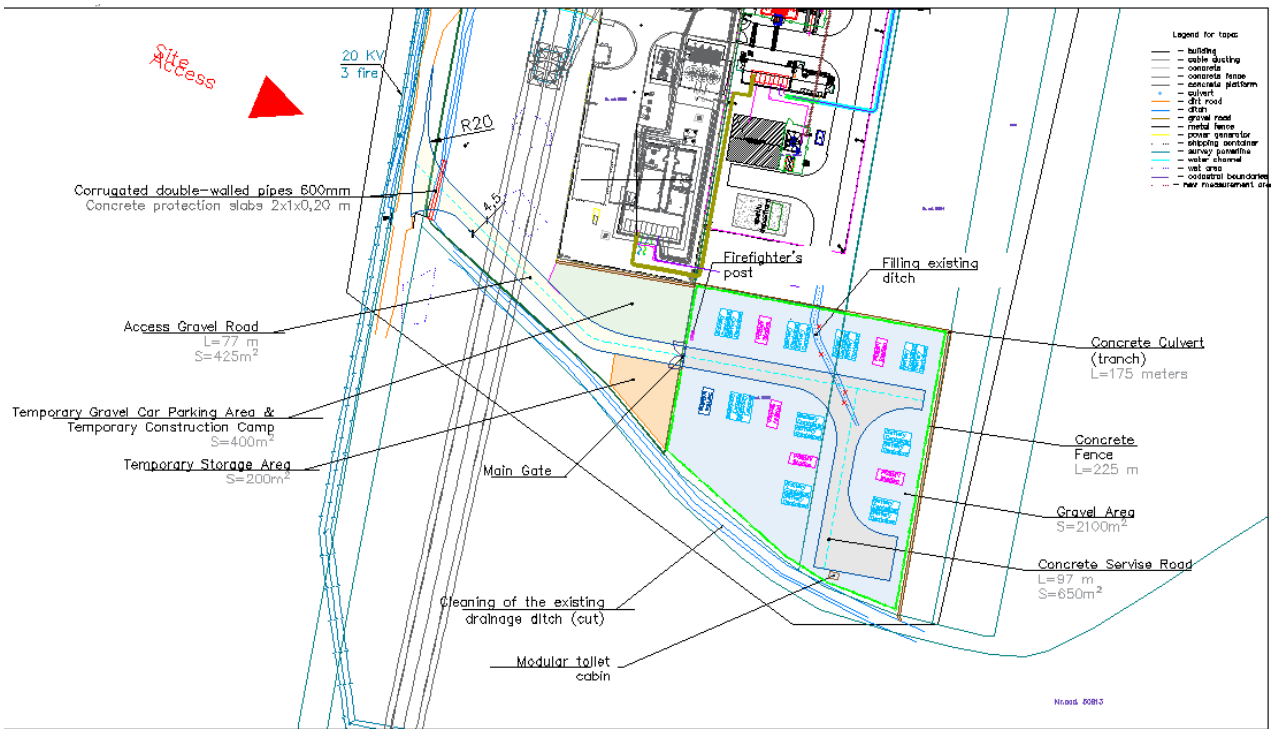

Fig. 2-2: GLODENI BESS layout

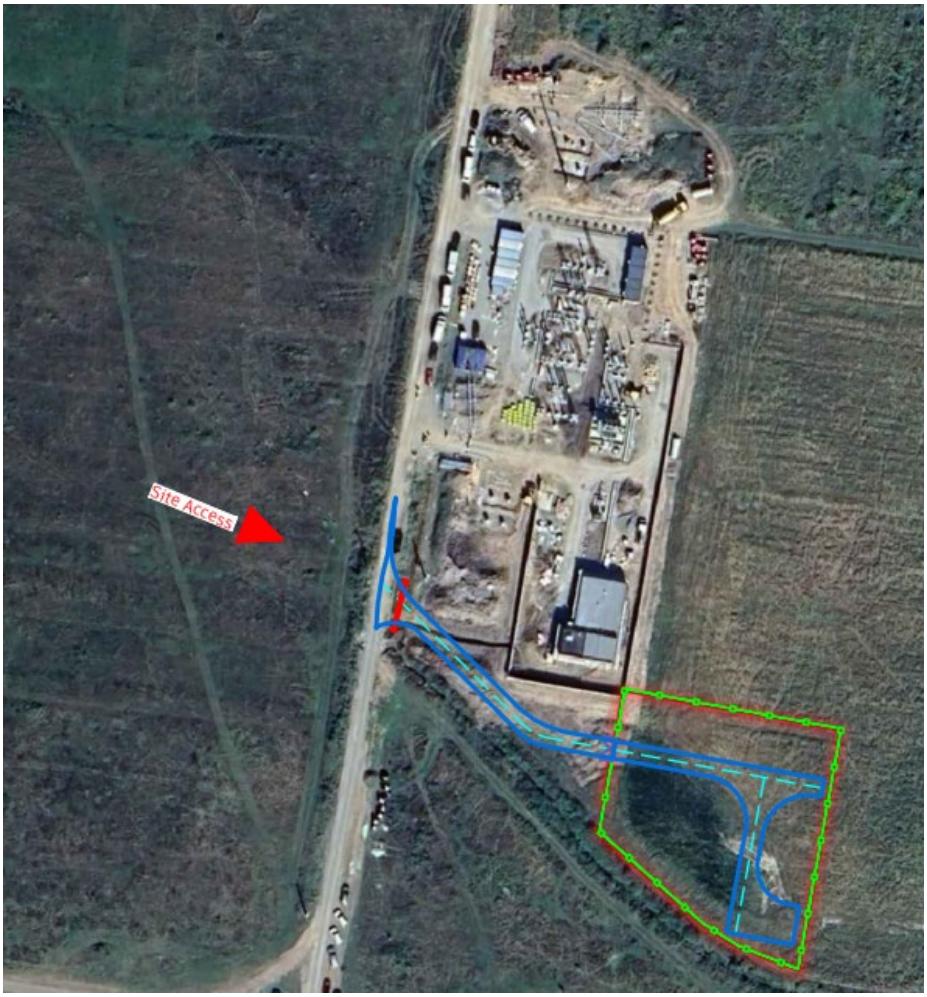

Fig. 2-3: GLODENI BESS situation plan

The main coordinates are shown in the Table 2-1.

Table 2-1: The coordinates of the main BESS objects

Object	Location	Latitude
GLODENI BESS field	near Glodeni	46.655513, 24.596842

2.2 Site Conditions

GLODENI BESS plot is characterized by the flat terrain. No height difference is observed.

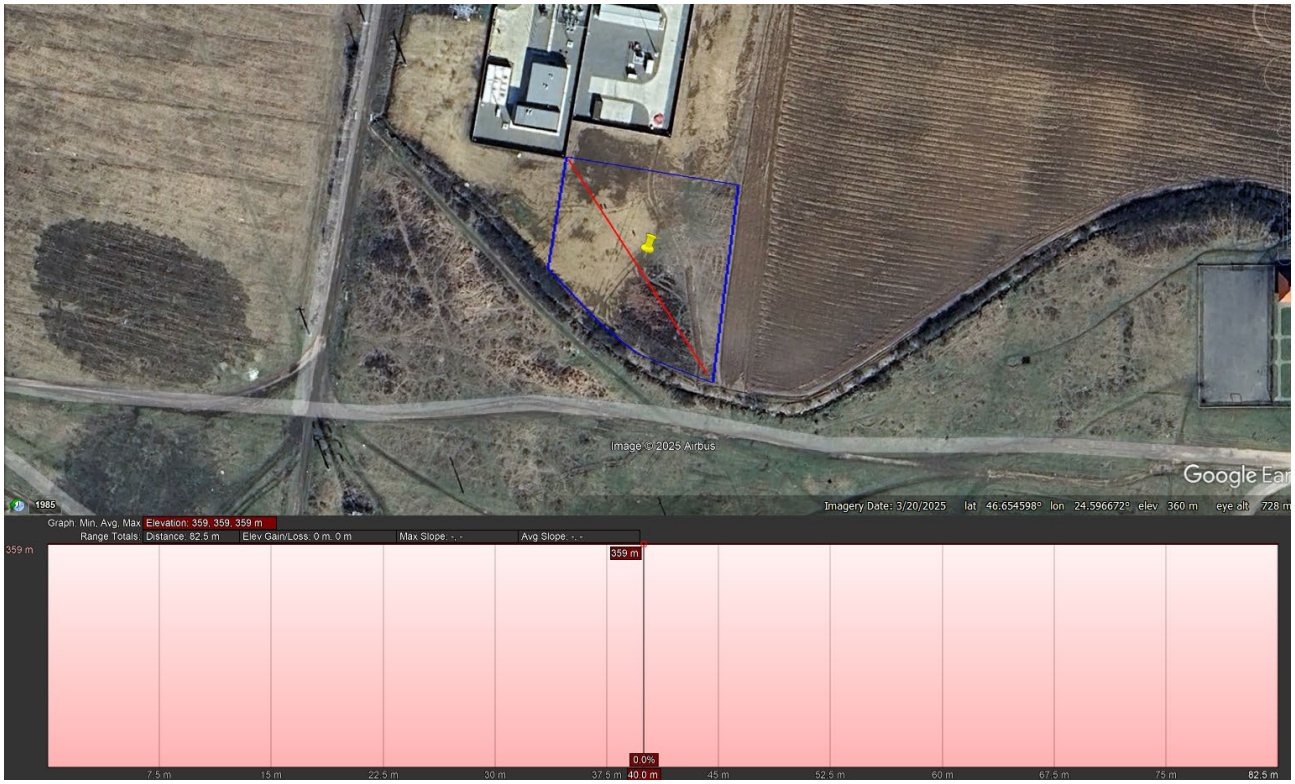

Fig. 2-4: Site slope

The access to building site is provided by existing asphalt road on the west of BESS field.

3. General requirements

3.1 Scope of Works and Service

The Providers shall perform a full scope of design Technical Project / Proiect Tehnic (PT) and Execution Details /Detalii de Execuție (DE), construction and commissioning works, including: supply of commodities (the customer will deliver the main equipment), installation, setting-up and commissioning of all required equipment.

Scope of works and services, to be implemented by the Providers, includes the following:

- securing sufficient, competent, skilled and trained personnel (Engineers, HSE staff, Supervisors, fitters) during entire construction period until the completion of the works and transfer to the customer;
- preparation of the Technical Project / Proiect Tehnic (PT) and Execution Details / Detalii de Execuție (DE) stage design documentation in conformity with the Romanian standards and norms.

- preparation and control of implementation work schedules. Coordination of work schedules with other organizations if some works are done by different Providers.
- obtaining all necessary additonal approvals, permits and licenses required for works implementation in accordance with Romanian law;
- packaging, labelling, transportation to the place of installation, insurance, unloading, temporary warehousing and storage at the construction site, corrosion protection of all structures and equipment necessary for works supplied by a Providers;
- unloading, temporary warehousing and storage at the construction site, corrosion protection of all structures and equipment necessary for works supplied by the Employer;
- submission of executive documents for equipment, structures and materials;
- in-time manufacturing and acceptance testing at the Manufacturer's plants with submitting to the Employer of necessary test protocols, equipment supplied by the Providers;
- site preparation, provision of temporary access roads and organization of temporary work sites for warehousing and/or storage of materials and equipment (incl equipment of Employer) and workshop areas;
- site geodesic marking and executive surveys;
- QA / QC according to Providers's quality program accepted and approved by Employer (hereafter to be read and understood as Employer or Employer's authorized representative) and the Employer's Engineer before any work emerges;
- development of project specific HSE program, HSE management on the site;
- preparation and submission of all necessary documentation for the Employer's approval, operational and acceptance tests, as well as commissioning of the completed Plant and its trial operation;
- establish progress report procedures and weekly issuance of progress reports effective from Project Commencement date;
- participation in the weekly progress and HSE meetings on site with at least one authorized person;
- training of the Employer personnel (or staff of an authorized organization representing the employer);
- provision of warranties, including elimination of defects during the Defects Liability Period for all parts that are subject of procurement;
- dismantling works at the existing plots (including removal for disposal of dismantling structures or remnants of structures);
- site clearing and cleaning including return shipment of transport frames, drums, containers, temporarily imported lifting equipment not procured by the Employer, etc.;
- gathering, safe temporary storing and removal of waists and secondary raw materials based on the agreements made with the organizations having the required permits and licenses in conformity with the Romanian legislation or their removal to objects dealing with the waists, agreed upon with the local state administration bodies in conformity with the rules, laid down by the local state administration bodies or local self- government bodies; ensuring that all Health, Safety and Environmental (HSE) regulations and requirements are fulfilled and documented until the final work acceptance;
- to ensure the integrity of the entire complex, even if some of the necessary equipment or services were not specifically mentioned in the data specifications;
- accounting the waste and secondary raw materials gathering and removal;
- reclamation of soil and vegetation layer after construction woks;
- any works and services to make the scope of works under complete and functional.

The Providers shall have the appropriate licenses (or certificates) to perform specific electrical works at the construction, installation, and commissioning sites, as well as obtain the access rights to these sites.

3.2 Infrastructure for Construction Site

3.2.1 General Information

The Providers shall arrange and is fully responsible for the establishment of his own site offices, personnel facilities such as residential compartments, sanitary facilities, fresh water supplies, wastewater (collecting, treatment and disposal), power supply for his own activities, telephone connections etc. It is the Providers's responsibility that all installations are carried out, approved, certified, and maintained in compliance with relevant local and international standards.

The Providers responsibility that all welfare or social facilities described as mandatory in Romania construction regulations, guidelines or requirements are always fulfilled and available on site. The Providers shall plan his work so that site neighbours only in limited circumstances will be affected by his activities. Any on site fencing outside the site borders has to be agreed in written with land owners, Authorities and Employer. Necessary approval or certification of interim constructions or tools at local or national authorities will rest solely at Providers.

3.2.2 Surveying

The Providers is responsible and scope for drawing the physical boundaries of the site at the work site. The Providers shall determine the natural boundaries of the site and the work site. The Providers shall determine the boundaries of the site where the work is to be performed, the fences and road closures shall be approved by the local authorities, and detour routes for the duration of the work shall be approved by the local authorities (communication and execution is performed by the Providers).

The Providers is responsible for authenticity and completeness of all geodesic surveys/measuring/ marking of/at all construction sites and access roads covered under his scope, and it is also the responsibility of the Providers to engage with competent and skilled chartered surveyor for the task.

The Providers shall create topographical network at the construction area for detailed planning of construction, each site shall have at least 3 topomarkers.

Documenting, maintaining and securing of markings (exact GPS positions including height measurements) are solely belonging to the Providers at his cost.

When the Providers has completed sections of work it is the Providers responsibility at his own cost to secure that the chartered surveyor makes control/executive measurements with associated documentation reports. Any report from the chartered surveyor shall be forwarded to the Employer.

Tolerances listed in the Tender documentation are, unless otherwise specified in writing, the maximum tolerances which will be allowed for the final construction. Determination and decision of supplementary demands for production or process tolerances rest solely at the Providers.

The Providers is responsible for establishing and maintaining a 3D coordinate system on the site. Conversion factors to general national or international coordinate systems must be present. The maximum distance between marked and secured fix points shall be 1,000 meters. Each fix point shall be secured by a concrete drain pipe surrounding the fix point. The concrete drain pipe needs to have a diameter and height of 1.0 m as a minimum.

All reporting, documentation etc. shall be linked directly to the site specific 3D coordinate system. Any observed or recorded divergence from global coordinates compared to site specific 3D coordinate system shall immediately reported in written to the Employer.

3.2.3 Availability of equipment, utilities, and construction material

The Providers have to provide all required equipment and utilities for the implementation of his scope of work.

The underground conditions at the site do not allow an extraction of materials for foundation construction at or near the site. The Providers is responsible for sufficient supply of the necessary resources to ensure work without downtime and delays:

- Water: The Providers shall make his own arrangements for fresh water supply.
- Crushed stones, gravel, sand, cement: The Providers shall concentrate the sufficient volume of inert materials near the construction site in advance before start of works starting to prevent any risks.
- Ready mix concrete can be obtained nearby. Thus, The Providers is strongly advised to identify alternatives/ foresee own site concrete plat(s);
- Electricity: Electricity is not available on-site; The Providers shall make his own arrangements for electricity.

3.2.4 Construction Camp

For the construction works a construction camp will have to be temporarily established on an area to be agreed with the Employer. Such a camp shall include all facilities for construction management, accommodation for personnel, storage and handling of construction material. Such an area shall be inside the Project plots.

The Providers shall supply offices with sanitary facilities, living / residential containers and dining facilities for his own personnel as well as for the Employer's staff and the Employer's Engineer, Furthermore, containers for tools, equipment etc. shall be supplied are advisable to overcome the logistic accommodation constraints in the area. Offices, living / residential containers, dining and sanitary facilities shall match with local standards and requirements in respect of space per user, equipment and cleanliness.

The Providers shall establish meeting facilities for site, HSE and progress meetings for up to 20 persons including heating / air conditioning, lighting, cleaning, projector, internet access etc.

Costs related to handling and disposal of waste water, sewer rest at the Providers. Public fresh water or sewers are not available on or close to the site.

Any authority approvals or certificates related to the above rests solely at Providers. Copies of all authority approvals or certificates shall be issued to Employer for information and shall be available at Providers on site offices at all times.

3.3 Logistics

The Providers is responsible for the complete and safe transport of all equipment and materials necessary for the successful implementation of his scope to the Project site.

3.3.1 Transport Considerations

Transportation of goods for the site must be organized in accordance with the local Law requirements.

The Providers shall provide:

- handling and shipping of materials, structures and equipment from suppliers;
- unloading and transportation to the site, including temporary storage (incl. unloading for equipment of Employer, storage of Employer's equipment, Providers of this tender also responsible for this storage);
- obtaining authorization from the Employer for use of warehouses, unloading platforms or other required facilities;
- cargo transportation insurance, issue of all documents and payment for the entire shipment, preparation of unloading documentation and fines, as well as customs clearance (applicable to materials and equipment supplied by the Providers);
- obtaining and verifying information regarding traffic restrictions;

- obtaining and verifying information on the cargo-handling gears for unloading of heaviest parts of structures and equipment;
- repair or replacement of equipment, instruments, materials and structures, damaged as a result of transportation or cargo-handling works;
- transportation routes selection and payment of additional costs associated with the choice of such routes (applicable to materials and equipment supplied by the Providers).

Securing of cargo in vehicles and transportation of goods is carried out in accordance with the regulations applicable to transport of this type.

The Providers shall provide all loading and unloading platforms with cargo-lifting equipment and delivery it to the Site (Romania, DDP Incoterms 2020).

3.3.2 Delivery Requirements

The Providers is responsible for the safe-keeping and integrity of goods delivered. Proper wrapping/ packing of the goods to be ensued.

All equipment, materials and spare parts shall be delivered in individual packaging, protected from mechanical damage during transportation and during temporary outdoor storage.

The Providers shall prepare and pack all materials, equipment and spare parts for shipment in such a way that they shall be protected from damage during transportation and during temporary outdoor storage.

The Providers bears responsibility for the packing quality, regardless of who performs the packing.

Mandatory, recommended and additional spare parts shall be packed separately and in such a way that they could be stored for required period of time.

Each package or box should be provided with a sign in Romanian and English languages with the name of the equipment, manufacturing plant and warning labels ("do not turn", "Caution, glass" and etc.).

Labels on containers and packages shall be printed using indelible stencil paint. All stencil labels on the face side shall be either made of waterproof material or lacquered in order to prevent their destruction during transportation.

Special instructions for handling the cargo shall be clearly written on all packages surfaces and in the packing list.

Each package shall contain a packing list in waterproof envelope.

All packages shall be clearly marked to establish cross-reference to the packing list.

Incoming inspections of materials and equipment delivered to be ensued at the site for each delivery.

During import process (if any) the following requirements shall be considered by the Providers:

- Customs control shall be ensured;
- Delivering of the goods after customs clearance at the customs warehouse;
- Provide the Employer with the necessary documents and samples for type acceptance of the goods; only after receiving the Employer confirmation, the Providers can deliver goods at the construction site.

3.4 Documentation

3.4.1 General Requirements

The Providers shall prepare and provide for the approval of the Employer all documentation, drawings, etc. in accordance with the terms of the Contract.

The quality of the documents submitted should provide a fast verification procedure. The Employer reserves the right to decide whether the documents have been accepted or not. Before submission of the

documentation, the Providers is required to submit a detailed list of documents and drawings that will be executed in accordance with the Contract.

The Project documentation to be further developed for the Employer shall be in English and Romanian (if required by Buyer). The list of documents (volumes, sections, drawings, etc.), which are to be developed additionally in English and Romanian, will be agreed upon at the pre-project meeting.

Before the submission to the Employer the documentation to be stamped and verified by certified verifiers, according to legal provisions.

All sketches and drawings of items to be submitted by the Providers for approval shall be implemented in the scale not less than 1:25. All important (basic) sizes, material etc. shall be indicated on the drawing.

Drawings shall be executed in black or colored lines on white background, be easy for reading, with all necessary detailed profiles and sections and/or assembly units.

All drawings shall be submitted along with the electronic versions in the DWG and PDF format.

Within the submission of documentation package, the Providers shall submit a detailed list/submittal sheet of documents and drawings, which are delivered.

If applicable, the Providers shall submit the drawings and data to the Employer's representative for approval in the following manner and following the designated deadlines:

Object	**Deadline and Remarks**
Technical Project / Proiect Tehnic (PT) and Execution Details / Detalii de Execuție (DE)	Within 60 days (calendar) after receiving Documentația Tehnică pentru Autorizația de Construire (DTAC)or main technical solution
As-built drawings	Within 30 days after completion of installation work
CAD file of as-built drawings	Within 30 days after completion of installation work
Detail construction schedule & method	Within 30 days from the date of signing the contract
Method of statement	Within 60 days from the date of signing the contract
Executive documentation	Acts on hidden works to be submitted for approval before proceeding with the next relevant works. Acceptance certificates - within 5 days after an acceptance commission and completed with all relevant executive documentation (geodesic surveys, test protocols etc.)
CAD files of approved drawings via cloud storage or USB flash drive	Within 15 days after approval
Weekly Progress Reports with photographs	By 3rd day of a following week
Packing lists and Transmittals (copy)	At each shipment/delivery
Invoice (copy)	At each shipment
Bill of lading (copy)	At each shipment
Certificate of origin (copy)	At each shipment

3.4.2 Regulations, Standards and Rules

The BESS shall be designed and constructed in all respects to conform with latest current engineering practice, in order to assure and guarantee specified performances. All components, materials and equipment, designing process, design, construction, installation, quality of works shall comply with recommendations, and standards issued by IEC as well as other applicable standards, specified in this Employer's Requirements and valid standards in Romania. The design shall be carried out in accordance with all valid local requirements in Romania, involving a certified Designer.

At the time of delivery, the equipment shall be certificated in accordance with the legislation of Romania. In addition, the Providers shall provide available certificates of conformity for supplied equipment, obtained in the country of the manufacturer or third countries.

All equipment shall be designed, constructed, built, tested, installed and commissioned as per the latest revisions of the applicable Romanian and International Standards (ISO, IEC, IEEE, EN etc.). All civil works shall be carried according to the Romanian standards and the Romanian legislation.

The site conditions shall be used to size the electrical equipment and civil structures, except if the Standards (e.g. ISO, IEC, IEEE, …) are more restrictive. In this case, those last ones apply.

Major International Standards to be considered are:

- IEC: International Electro Technical Commission
- ISO: International Organisation for Standardisation
- EN: European Standards and Eurocodes

National Standards:

- Romanian National Standards
- Romanian Grid Code

All design and construction works must meet the requirements specified in all relevant standards (including IEC), but not limited to those described below:

- All ISO; IEC and EN standards related to mechanical and hydraulic machinery, systems and equipment;
- All ISO, IEC, EU and EN standards related to electrical installations and electrical machinery, systems and equipment;
- All ISO and EN standards for reinforced concrete structures and foundations;
- ISO 9001 standard;
- ISO16426 Quality assurance system;
- ISO 14001 Environmental assurance System;
- IECRE Conformity Assessment (CA) system regarding type certification;
- EN / ISO 12944-(1-8): Corrosion protection of steel structures;
- ISO 9223 – ISO 9226: Corrosion of metals and alloys;
- "Occupational Health and Safety"

National Standards – all applicable Romania national standards valid at time of construction (the compliance to standards shall be strictly followed by Providers's personnel and certified persons in charge who shall be identified in the construction permits. Non-provision of any valid standard herein or in Annexes hereto does not provide a relief to the Providers against any responsibilities imposed by compliance to national legislation).

If there is a conflict between a code or a standard listed, the more stringent code or standard is to be considered.

The Providers is responsible for the coherence of the codes and standards system chosen as reference, especially when codes and standards are from various origins.

This coherence must be ensured for all civil and electrical engineering throughout design and construction.

In any event, the quality and completeness of the design works as well as compliance of the designs with applicable Romania legislation shall be responsibility of the Providers.

International system of units SI shall be used in all Project documentation.

Over and beyond mentioned of General Requirements the following regulations must be applied to design and construction works as well as to equipment and materials exploited:

- COMMISSION REGULATION (EU) 2017/1485
- COMMISSION REGULATION (EU) 2017/2196
- COMMISSION REGULATION (EU) 2016/631
- COMMISSION REGULATION (EU) 2016/1388
- COMMISSION REGULATION (EU) 2016/1447
- Romania Grid Cod
- All of the other applicable Romania laws, codes, standards, regulatory documents and legislation

If there is a conflict between a code or a standard listed, the more stringent code or standard is to be considered.

Switchgears has to comply with the latest IEC standards, local norms, EN equivalents, especially the following standards:

Standard	**Specification**
IEC 62271-1	High-voltage switchgear and controlgear – Common specifications
IEC 62271-203	High-voltage switchgear and controlgear Part 203: Gas-insulated metal-enclosed switchgear for rated voltages above 52 kV
IEC 61000 series	Electromagnetic compatibility (EMC)
IEC 60298	A.C. metal-enclosed switchgear and control gear for rated voltages above 1 kV and up to and including 52 kV
IEC 60694	Common clauses for high-voltage switchgear and control gear standards
IEC 60056	High-voltage alternating-current circuit-breakers
IEC 60137	Bushings for alternating voltages above 1000 V
IEC 60071 series	Insulation co-ordination
	Grounding systems for high-current switchgear with rated voltages above 1 kV
IEC 60073	Coding principles for indicating devices and actuators
IEC 60529	Degrees of protection provided by enclosures (IP-code)
IEC 60129	Alternating current disconnectors (isolators) and grounding switches
IEC 60044-1	Current transformers
IEC 60044-2	Inductive voltage transformers
IEC 60815-1	Selection and dimensioning of high-voltage insulators intended for use in polluted conditions – Definitions, information and general principles
IEC 60815-2	Selection and dimensioning of high-voltage insulators intended for use in polluted conditions – Ceramic and glass insulators for ac systems
IEC 60168	Tests on indoor and outdoor post insulators for systems with nominal voltages greater than 1000V

The proposed power transformers should comply with the following standards:

Standard	**Specification**
IEC 60076	Power Transformer
IEC 60214	Tap-Changers
IEC 60296	Fluids for electrotechnical applications – Unused mineral insulating oils for transformers and switchgear
IEC 60060	High-voltage test techniques
IEC 60137	Insulated bushings for alternating voltages above 1000 V
IEC 60354	Loading guide for oil-immersed power transformers

Standard	Specification
IEC 60542	Application guide for on-load tap-changers
IEC 60567	Oil-filled electrical equipment - Sampling of gases and of oil for analysis of free and dissolved gases - Guidance
IEC 60599	Mineral oil-filled electrical equipment in service - Guidance on the interpretation of dissolved and free gases analysis
IEC 60616	Terminal and tapping markings for power transformers

The proposed circuit-breakers should comply with the following standards:

Standard	Specification
IEC 62271-100	High-voltage switchgear and controlgear - Alternating-current circuit-breakers
IEC 62271-101	High-voltage switchgear and controlgear - Synthetic switching
IEC 62271-110	High-voltage switchgear and controlgear – Inductive load switching
IEC 60427	Synthetic testing of high-voltage alternating-circuit-breakers - Synthetic switching

The proposed disconnectors and earthing switches should comply with the following standards:

Standard	Specification
IEC 62271-102	High-voltage switchgear and controlgear - Alternating-current disconnectors and earthing switches

The proposed instrument transformers should comply with the following standards:

Standard	Specification
IEC 61869-1	Instrument transformers – General requirements for instrument transformers
IEC 61869-2	Instrument transformers – Additional requirements for current transformers
IEC 61869-3	Instrument transformers – Additional requirements for inductive voltage transformers
IEC 61869-5	Instrument transformers – Additional requirements for capacitive voltage transformers

The proposed insulation coordination and surge arresters should comply with the following standards:

Standard	Specification
IEC 60071	Insulation co-ordination
IEC 60099-4	Metal-oxide surge arresters without gaps for ac systems

The proposed post insulators should comply with the following standards:

Standard	Specification
IEC 60273	Characteristic of indoor and outdoor post insulators for systems with nominal voltages greater than 1000 V

The proposed SF6-Gas should comply with the following standards:

Standard	Specification
IEC 60376	Specification of technical grade sulfur hexafluoride (SF6) for use in electrical equipment

Standard	Specification
IEC 60480	Guidelines to the checking sulfur hexafluoride (SF6) taken from electrical equipment

The proposed measuring relays and protection equipment should comply with the following standards:

Standard	Specification
IEC 60255	Measuring relays and protection equipment

The proposed local control cubicles should comply with the following standards:

Standard	Specification
IEC 60439	Low-voltage switchgear and controlgear assemblies
IEC 60947	Low-voltage switchgear and controlgear
IEC 61439	Low-voltage power switchgear and controlgear assemblies

The proposed metering should comply with the following standards:

Standard	Specification
IEC 62052	Electricity metering equipment (a.c.) - General requirements, tests and test conditions
IEC 62053	Electricity metering equipment (a.c.) - Particular requirements

The proposed EMC should comply with the following standards:

Standard	Specification
IEC 60694	Common specifications for high voltage switchgear and controlgear standards

The proposed enclosures should comply with the following standards:

Standard	Specification
EN 50052	Cast aluminium alloy enclosures for gas-filled high-voltage switchgear and controlgear
EN 50064	Wrought aluminium and aluminium alloy enclosures for gas-filled high voltage switchgear and controlgear
EN 50068	Wrought steel enclosures for gas-filled high-voltage switchgear and controlgear
EN 50069	Welded composite enclosures of cast and wrought aluminium alloys for gas-filled high-voltage switchgear and controlgear
EN 50089	Cast resin partitions for metal enclosed gas-filled high voltage switchgear and controlgear

The proposed earthing grid should comply with the following standards:

Standard	Specification
IEEE Std.80	IEEE Guide for Safety in AC Substation Grounding

The proposed cables should comply with the following standards:

Standard	Specification
IEC 60028	International standard of resistance for copper
IEC 60060	High voltage test techniques

Standard	Specification
IEC 60071	Insulation co-ordination
IEC 60093	Methods of test for volume resistivity and surface resistivity of solid electrical insulating materials
IEC 60183	Guide to the selection of high voltage cables
IEC 60228	Conductors of insulated cables
IEC 60229	Tests on cable over-sheaths, which have a special protective function and are applied by extrusion
IEC 60230	Impulse tests on cables and their accessories
IEC 60287 series	Calculation of the continuous current rating of cables (100 % load factor)
IEC 60300	Methods of test for PVC insulation and sheath of electric cables
IEC 60302 series	Tests on electric and optical fibre cables under fire conditions
IEC 60502	Extruded solid dielectric insulated power cables for rated voltages from 1 kV - 30 kV
IEC 60811	Common test methods for insulating and sheathing materials of electric cables
IEC 60853	Calculation of the cyclic and emergency current ratings of cables
IEC 60859	Cable connections for gas-insulated metal-enclosed switchgear for rated voltages of 72.5 kV and above
IEC 60949	Calculation of thermally permissible short circuit currents, taking into account non-adiabatic heating effects
IEC 60986	Guide to the short circuit temperature limits of electric cables with a rated voltage from 1.8/ 3 (3.6) kV to 18/ 30 (36) kV
IEC 60793	Optical fiber generic specification: general and measuring methods, mechanical properties, transmission and optical characteristics, environmental characteristics
IEC 60794	Optical fiber cables general specification, product specification and telecommunication cables
IEEE Std. 48	Test procedures and requirements for alternating-current cable terminations used on shielded cables having laminated insulation rated 2.5 kV through 765 kV or extruded insulation rated 2.5 kV through 500 kV
ITU-T G652	Characteristics of a single mode optical fiber cable
ITU-T G653	Characteristics of a dispersion shifted single mode optical fiber cable
ITU-T 653	Characteristics of a 1550 nm wavelength loss minimized single mode optical fiber cable

The other standards to be followed with:

Standard	Specification
IEC 60051	Direct acting indicating analogue electrical measuring instruments and their accessories
IEC 60085	Electrical insulation - Thermal evaluation and designation IEC 60086 Primary batteries
IEC 61850	Communication networks and systems for power utility automation
IEC 60870	Telecontrol equipment and systems
IEC 62219	Overhead electrical conductors - Formed wire, concentric lay, stranded conductors
DIN VDE 0845	VDE Specification for protection of telecommunication installations from overvoltages

A description of the corrosion protection systems in accordance with ISO/EN 8501-3:2007, 12944-(1-8) has to be supplied for review by the Employer and the Employer's Engineer. All electrical components, including their housing, have to be protected properly against aggressive climatic conditions.

All calculations, specifications, etc. have to be executed according to requirements in relevant standards and codes as per their latest revisions and in full accordance with requirements from approving bodies. All mentioned codes in this document will be prevailed by any newer edition than listed in this document.

3.4.3 Design Documentation

The essence of the design shall be simplicity and reliability in order to ensure that the equipment will allow a long trouble-free service with low maintenance costs. The level of technology shall be up to date.

All equipment supplied (by Providers) shall be designed to meet the needs for satisfactory operation under all site specific variations of wind, ambient climate (low temperatures, possibility of lightning), and grid conditions.

Execution, composition, and content of Design documentation shall comply with all relevant IEC standards.

If design rules and regulations are not available, the proposed design solutions shall be coordinated with relevant state inspection authorities.

All changes taking place at installation and construction works should be considered in As-Build documentation.

3.4.4 Executive design

The Design documentation for construction is to be developed in full compliance with the requirements of the Contract and the technical decisions taken during the development of the Technical Project / Proiect Tehnic (PT) and Execution Details / Detalii de Execuție (DE) stage.

• The Tenderer must provide the Employer with design documentation for each volume using electronic means for the approval.

• The Employer notifies the Tenderer of the absence or presence of comments.

• The Tenderer must provide the Employer with the revised volume for reconsideration in accordance with the notes using electronic means.

• Changes to the Design documentation are to be carried out in accordance with the Romanian standards.

• If further development of the Design documentation necessitates changes to the documents already considered/approved by the Employer, the Tenderer shall notify the Employer and provide an adjusted volume for consideration/approval.

• After the Employer's approval of a design drawing/volume it is not allowed to make any changes without a written consent of the Employer.

• After approval the complete set of Design documentation by the Employer, the Tenderer submits to the Employer hard copies of Design documentation (in three copies) and electronic format in PDF, with stamps and signatures, as well as the original format, such as dwg, excel, etc.

• The complete package of the Technical Project / Proiect Tehnic (PT) and the Execution Details / Detalii de Execuție (DE) stage design is to be transmitted together with the cover letter in which the Tenderer confirms that the Executive design stage design documentation is developed in accordance with the main technical decisions of Construction design stage of the design and there are no differences.

3.4.5 As-Build documentation

By the time of works completion, the Providers shall prepare all as-built design drawings and acceptance/executive documentation that shall contain the actual space-planning, architectural, structural, technical and technological solutions and submit them to the Employer during 5 days after completion of

works. If for any reason As-Build documentation can not be prepared within 5 days, the Providers may apply for an extend reasonable term but no longer than 30 days.

Documentation shall be prepared in two (2) copies in English language (and Romanian - if Buyer required). Works acceptance shall be carried out based on this scope.

All as-built documentation shall be approved by the Employer.

The Providers shall provide a copy of the as-built documentation on USB flash drives in PDF format and in their original formats. USB flash drives shall include only the final version of each document.

The Providers may apply for the work acceptance just after submitting entire package of As-Build documentation.

All drawings and documents shall be prepared in accordance with the above requirements, and after acceptance of the completed scope they shall become the Employer's property.

3.5 Construction organization and management

3.5.1 General Requirements

The Providers will be fully responsible for the implementation of his scope at the turn-key basis and within the Project deadlines. Hence, he shall provide skilled personnel and as required by law for the construction and the supervision on his work executors and subcontractors (if any) in order to ensure high quality of works. Employer will reserve his right at any time to expel or request any of Providers's or his subcontractors personnel to be replaced in case of misconduct, unpleasant behaviours, negligence, use of euphoric drugs or alcohol, criminal activities etc.

Before commencing the construction works, the Providers's personnel shall prepare a work area and make arrangements with the Employer so that works may be performed without interfering with any other activities at the site.

Before commissioning, the Providers shall notify the Employer in writing on readiness of the scope for final inspection.

Upon completion of construction works, the Providers shall remove all temporary facilities that were installed during construction: temporary protection structures, temporary grounding, temporary fences etc., and carry out a detailed inspection of the scope completeness.

The Providers shall put in order the areas, which were temporarily used during construction.

The languages at site are Romanian and English. If the site managers do not speak these languages, the Providers has to provide for the respective interpreters for the whole time without extra costs.

3.5.2 Provider's Staff

Providers should submit a list of staff entitled to be at site (before at 7 days), as follows: responsible manager(s), responsible work performer(s). It is necessary to specify the staff position, name and contacts in the list.

The Providers bears the responsibility for coordination of the works between them. The Providers bears the responsibility for the Company detailed data and the information of the similar practice experience availability of subcontractors proposed which have been submitted to the Employer for his approval. If a subcontractors is unable to ensure the delivery of the foreseen products and services, the Providers shall provide an alternative subcontractors to be approved by the Employer within the shortest term.

3.5.3 Construction Schedule

The overall project master schedule is indicated in -Schedule 3_Construction program.

The Providers is responsible for developing, establishing and updating (on a weekly basis) of detailed construction schedule based on the milestones indicated in master schedule.

Any delays, or expected delays, in construction works, manufacturing or installation of equipment shall be recorded, the Employer shall be immediately informed. Any delays shouldn't have influence on the completion date of the contract.

3.5.4 Interface management

All works at the construction site shall be carried out in such a way so as not to impede the actions of any Providers performing work at the site of another contract with the Employer, or work/operation of existing facilities.

The Providers is responsible for coordination of all works performed as well as interfaces between other Providers at the site. The Providers shall make every effort to align his work schedule with one of another Providers working in the same area. All disputes must be resolved by negotiations and joint inspections.

Any cooperation in terms of successful project progress between Providers during the construction process is welcomed by the Employer.

3.5.5 Requirements for personnel on the site

During the construction period, the following minimal amount specialists (covering the area of responsibility) should be available on the site:

		Responsible Providers personnel	Availability Hours per day / days per week
1	Period of preparatory work	Site manager	8/5
		Storekeeper (having the right to sign documents, protocols from the head of the Providers)	8/5
		construction engineer (quality engineer)	8/5
		Labor safety engineer	8/5
2	Period of civil work	Site manager	8/5
		construction engineer (quality engineer)	8/5
		Labor safety engineer	8/5
		Storekeeper (having the right to sign documents, protocols from the head of the Providers)	8/5
3	Period of electrical work	Site manager	8/5
		construction engineer (quality engineer)	8/5
		Electrical engineer (quality engineer)	8/5
		Labor safety engineer	8/5
		Storekeeper (having the right to sign documents, protocols from the head of the Providers)	8/5
4	commissioning	Site manager	8/5

		Electrical engineer (quality engineer)	8/5
		Commissioning engineer inverters	8/5
		Commissioning engineer trackers	8/5
		Commissioning engineer SCADA and PPC	8/5

3.6 Quality Assurance and Quality Control (QA&QC)

3.6.1 General Requirements

The construction and erection work shall be supervised by professional site managers/responsible executors with extensive skills and experience in the work related with the scope under the Contact. They must ensure that the work is carried out in an orderly manner according to the technical documents, construction schedule and the quality management system (QM) under ISO 9001.

For the quality assurance of concrete, soil, and water analysis, it is requested to co-operate with an independent laboratory as sub Providers. All costs arising are to be beared on the Providers. All results worked out by the laboratory should be additionally submitted to The Employer in English English and Romanian language (upon request by the Employer), as well as the material test results of all construction material.

Before commencing any installations, the Providers's personnel shall perform an inspection of the delivered items signalising eventual defects due to transport or any other reason, defects which would affect his warranty on the supplied scope.

Any commissioning or acceptance tests and inspections shall be carried out by Providers's personnel with participation of Employer's personnel – but all responsibilities linked to the quality of performed works and test rest solely on Providers and his personnel.

3.6.2 Quality Management System

All works shall be performed by the Providers in full scope and with high quality.

The Providers's quality system shall ensure that designing, manufacture, inspections, tests, construction, installation and commissioning works are carried out under supervision.

The quality system shall include: quality control and assurance program, supervision, test program, incoming and acceptance inspections, punch clearance, handover procedure and warranty.

The quality assurance system shall meet the standards of the International Organization for Standardization (ISO) 9000, 9001, 9004, 19011, 10012, 14001 and national quality standards.

Compliance with the quality system does not relieve the Providers of his responsibilities on quality of equipment supplied and works performed.

The Providers shall perform all required action during incoming detection of errors/defects or nonconformance of products after supplying on the construction site.

In the Providers 's quality system the procedure of submission of notifications on each error/defect and their elimination (punch clearance) shall be developed.

The Providers shall strictly follow the procedure of filing all error/defect case notifications.

This punch clearance procedure shall be submitted to the Employer for review and approval as a part of the quality program and shall include at least the following:

a) documentary confirmation that each error/defect case has been identified and eliminated, and/or a defect report being processed for defect elimination;

b) notification form on each error/defect case shall include at least the following information:

- identification of a non-conforming product and description of wrong material's properties or manufacturing process;
- reference to the item of the Employer's requirements and design drawing/specification, which determine the characteristics of the equipment/process;
- Providers's planned actions on elimination of error/defect and expected date of such elimination.

3.6.3 Quality of materials, equipment, tools, and spare parts

All equipment supplied by Providers, materials and structures used for the works implementation, as well as special accessories, tools, and instruments necessary for maintenance of the equipment at the substation during operation shall be certified in Romania according to Romanian national requirements.

All materials shall be designed to withstand the stresses imposed by the working and the ambient conditions without distortion or deterioration affecting the efficiency and reliability of the respective equipment.

The measuring instruments shall be approved for use in Romania.

All supplied equipment, fittings, measuring instruments and materials used for the work implementation, as well as special accessories, tools and instruments required for the plant maintenance in terms of its operation, shall be new, unused, have standard manufacturer's design. These shall be designed taking into account the latest normative documents. The Providers shall confirm quality and origin of the goods by corresponding type test certificates.

All spare parts (if applicable) shall satisfy the requirements and conditions of these Employer requirements and approved design to materials and basic equipment.

They shall be fully interchangeable and acceptable for use instead of the main parts, be provided with factory specifications, accordingly marked and prepared (mothballed) for long-term storage.

All spare parts shall be provided with one copy of instructions in English language, along with respective catalogues (if required by Buyer – in Romanian).

The Providers shall provide a written guarantee that parts delivered under the Contract will be available on the market for the Employer for ten (10) years upon expiration of the defect’s liability period, regardless of their obsolescence.

3.6.4 Testing, Commissioning and Operational Acceptance

All materials, structures, and equipment (type, description, quality, program, etc.) used by the Providers for works execution shall be inspected by the Employer.

The testing program shall be prepared by the Providers and approved by the Employer no later than 30 days before the start of tests.

The Providers shall perform tests of the equipment, structures and materials at all stages: manufacture, installation on site and commissioning (if required by normative documents).

The Providers shall perform tests in accordance with the Employer's requirements and current standards for equipment and materials, or provide acceptance certificates and type test reports.

The Providers shall submit valid type test certificates of all major electrical equipment before the handover process. By non-fulfillment of this requirement the work acceptance may be rejected.

Where test methods are not defined by standards, or there is a choice of standards, the Providers shall submit to the Employer the methodology of the tests, by which he proposes to perform tests.

Tests during installation and commissioning shall be performed according to the test program being in accordance with the IEC standards, as well as in accordance with the manufacturer's instructions. If any test in these documents has different regulations, then tests shall be performed under the most stringent requirements.

The Providers shall provide the comprehensive commissioning plan according to Romanian legislation to achieve timely achievement of mechanical completion.

The Providers is responsible for testing, commissioning and Operational Acceptance of his scope in conjunction with the Employer.

Factory-built structures and equipment shall be completely assembled, adjusted and tested at the factory.

Simultaneously with delivery of equipment, the Providers shall submit to the Employer the factory test reports, which confirm the quality and technical characteristics of the equipment.

The Providers shall ensure compliance of factory test reports, certificates and other necessary documentation delivered with equipment, with the requirements of current valid in Romania IEC standards.

3.6.5 Approvals, Technical Inspection and Supervision by the Employer

Final design documentation to be approved by the Employer.

All As-Build Documentation to be verified by the Employer's supervisors.

The Employer or its representatives are entitled to inspect any of the site activities performed at any time, the number of inspections is unlimited. The Providers shall grant the full compliance to Romanian and international site supervision and construction standards and grant access to all of the documentation required by the technical supervisors and Employer's representatives.

If any of the test results specified in the technical specifications would not satisfy the requirements, the Employer has the right to demand from the Bidder to make a re-testing.

Upon request of the Employer, the Providers shall perform additional tests specified in the technical specifications or in the Contract. In addition, the Employer may request to perform additional tests or repeat tests already performed based on the results of the analysis of already performed tests of materials or in case of deviations from normative technology of installation or testing of equipment at the facility.

The Employer reserves the right to perform regular or occasional HSE inspections at the site.

3.7 Health, Safety & Environment (HSE)

National and International HSE requirements (hereunder IFC 2007) or specific superior or overruling home country requirements / legislations of Providers's personnel shall at all times be followed. Prior to start of construction works Providers shall issue a project specific HSE plan, which shall undergo continuously updating until expiry of Defect Notification period in accordance with the conditions of Contract.

Providers shall assign a HSE Engineer with sufficient independency and fully authorised, who shall be responsible for the general HSE set up and daily operation of the site from a HSE perspective. Providers's assigned HSE Engineer shall be present "on site" full time from the moment in time where Providers initiates any activities on site.

Participation in any HSE meetings "On Site" is mandatory for Providers and his HSE responsible engineer. Providers is obliged to record and file all "On Site" HSE related observations, actions, safety walks, internal HSE meetings, "near misses", accidents etc. at his site office and make them available for the Employer / Employer's Engineer at all times.

HSE education levels / recordings and personal certificates of ALL personnel shall be available at Providers's "On Site" office. No personnel or employees are allowed to perform works, tasks or operations which they aren't specifically educated and certified to perform. Providers shall at arrival of any personnel "On Site" secure that those have or will get the required education / certification before any works, tasks or operations are assigned to arriving personnel.

Information boards at all working sites shall secure that vital HSE information at all times will be available for all personnel. Information boards shall as a minimum list:

- Exact Site Address (including exact GPS coordinates for offices)
- Exact Working Site Location (including exact GPS coordinates for Working Site)
- Alarm telephone number
- Telephone number to local Fire department
- Telephone number to local Police department
- Telephone number to HSE responsible of Employer, Employer's Engineer and Providers
- Location of fire extinguishers and instructions for use of the fire extinguishing equipment
- Location of first aid kits including “eye washers” and heart starters
- Working Site Plan showing Access and Escape routes
- Location of Muster place

All National or International legislations, requirements, rules or guidelines referring to personal anchor points (shock loads, design, locations, attachments, internal distances etc.) and installed falling arrester systems shall comply with before mentioned requirements.

Providers shall ensure that his own, subcontractors and suppliers personnel at all times follow at all times all site specific HSE rules and requirements whenever they are present on site. It is Providers’s obligation to ensure that his own and referring personnel are sufficient educated and informed in relation to all relevant HSE topics and specific HSE site rules and requirements. Providers shall besides the above ensure that his personnel at all times follow Providers’s own HSE rules, guidelines or requirements which can be very specific for use of equipment or machinery.

Any employee or personnel observed, told to be or caught in performing works, tasks, operations or behaviour, where HSE requirements, rules or guidelines are disregarded, can and will be expelled from the site immediately.

Providers, own personnel or referring personnel are obliged to correct or stop other Providers, visitors etc. in case those are observed intentionally or unintentionally to cross / break or being close to crossing / breaking HSE rules, requirements or guidelines etc. in force at the project site.

Providers shall ensure that first aid kits including “eye washers” are available at all work locations and that first aid kits always are complete. Providers shall ensure that at least one defibrillator will be available “On Site”. A central facility for first aid treatment with specifically trained personnel shall be provided. Moreover, Providers shall ensure that his personnel have passed an elementary first aid training including cardiac arrest treatment (according to international and local HSE regulations)..

Providers shall ensure that safety hard hat, safety footwear, safety jackets and, if applicable, working gloves and safety googles shall be worn at all working locations. Providers shall provide such safety materials also to the Employer’s Engineer’s personnel.

Use of drugs and alcohol are strictly prohibited when working or being present “On Site”. Employer shall immediate initiate investigations in case of personnel being found under suspicion of drug or alcohol misuse. Confirmed or proven uses of drugs or alcohol will immediate release expel and permanent withdrawn Site access rights of affected personnel.

Work under suspended loads is strictly prohibited and all tasks, works and processes shall be planned and executed in a way that removes all risks related to suspended loads. All HSE Signs and Markings in site facilities and on-site shall be written in English and Romanian (if required).

Providers’s HSE responsible officer is required to participate in weekly on-site HSE Meetings. All Providers’s working on site shall record, report and file all HSE related incidents (Near misses, Accidents, Injuries, HSE on site Safety Rounds etc.) and forward statistics to the Employer and the Employer's Engineer twenty-four hours

before weekly HSE meetings are to be held. All HSE related recording shall be available at all time at Providers's site office.

3.8. Guarantee Period

The Providers guarantees that Results of Works will be free from any error, defect, failure, fault or damage in design, material, workmanship, operation and title, performed in accordance with applicable law and comply with the provisions of this Agreement for a period of five (5) years, calculated from Completion (meaning from the date Completion is stated to have been achieved in the relevant Completion Certificate) or, if earlier, from the date of termination of this Agreement for prolonged force majeure pursuant to Section __ of the Contract (the "Guarantee Period") and without prejudice to any legal warranty term incumbent on the Providers, including the warranty terms provided by Romanian Law no. 10/1995 regarding quality in construction: (i) warranty against failure to achieve the qualitative level of the Works, calculated as of the Legal Reception date, depending on the category of importance of the building/facility/construction, as follows: 5 years for the categories A and B, 3 years for the category C and 1 year for the category D; (ii) warranty against hidden defects of the construction for a period of 10 years as of the Legal Reception date and (iii) warranty against defects of the core structure resulted from noncompliance with the design and execution regulations, for the entire duration of the existence of the construction.

3.8.1. In order that the Results and each part thereof shall be in the condition required by this Agreement, (fair wear and tear excepted) by the expiry date of the relevant Guarantee Period or as soon as practicable thereafter, the Providers shall:

a) complete any work which is outstanding stated in the Completion Certificate, within such reasonable time as instructed by the Client; and

b) execute all work required to remedy defects including but not limited to all consequences of the defects on the Results, within such reasonable time as instructed by the Client on or before the expiry of the relevant Guarantee Period.

For the avoidance of doubt, the Providers's obligations under this Section 3.8.1 include supplying goods, parts, equipment, tests, manpower and other services required in connection with remediation of such defect.

3.8.2. All work referred to in Section 3.8.1. (b) shall be executed at the risk and cost of the Providers, unless the Providers can demonstrate that the defect occurred due to:

normal wear and tear;

the incorrect operation of the Results; or

a failure of the Client to adequately maintain the Results.

3.8.3. If and to the extent that the defect is attributable to the Client, the Client may request that the Providers remedies the defect within a reasonable time, which the Providers shall not be entitled to unreasonably refuse to do. The Client shall reimburse the Providers for its reasonable and proven costs incurred in remedying the defect.

3.8.4. If the Providers fails to remedy any defect or damage within thirty (30) days, a date may be fixed by (or on behalf of) the Client, on or by which the defect or damage is to be remedied. The Providers shall be given reasonable notice of this date.

3.8.5. If the Providers fails to remedy the defect or damage by this notified date and this remedial work was to be executed at the cost of the Providers under Section 3.8.1(b) the Client may (at his option):

a) carry out the work himself or by others, in a reasonable manner and at the Providers's cost and the Providers shall pay to the Client the costs reasonably incurred by the Client in remedying the defect or damage (however the Providers shall not be responsible for such remedial work undertaken by the Client or parties engaged by it); or

3.8.6. Where a defect is corrected pursuant to this Section 3.8, the relevant Guarantee Period shall be extended for the corrected part of the Works (and that part only) by a period equal to the greater of (i) twenty-four months (24) months and (ii) the remainder of the original, relevant Guarantee Period. Except where expressly provided by this Agreement, the Guarantee Period shall not exceed ten (10) years from the Completion, notwithstanding any legal guarantee periods.

3.8.7. Notwithstanding other liabilities provided by the Agreement, if any claim in connection with the elimination of defects is brought against the Client by third parties (before or after Completion), the Providers shall reimburse the Client for such costs based on the invoice provided by the Client.

3.9. Liability for defects after the guarantee period

3.9.1. Following expiry of the relevant Guarantee Period the Providers shall remain liable to rectify any defects, and any damage caused by such defects, which were caused by:

a) the Providers's gross negligence;

b) any works or obligations not completed by the Providers in accordance with this Agreement; or

c) due to a material neglect of quality control by the Providers,

which the Client could not reasonably be expected to have discovered in the Test on Completion or during the Guarantee Period.

3.9.2. For the avoidance of doubt, the provisions of Sections 3.8 and 3.9. do not act to limit the Client's right to bring claims against the Providers (whether for defects in the Results or otherwise) pursuant to mandatory Romanian law.

4. Particular Requirements and Specifications

4.1 Unloading requirements

According to the scope of work, the Providers's scope includes unloading of equipment and materials supplied by the employer. The list of equipment supplied by the Employer is described in the table to “scope of work”.

Employer responsibilities:

- transfer the equipment delivery schedule to the Providers no later than 2 weeks before delivery to the site;
- transfer to the Providers the requirements for storing and unloading equipment;
- ensure the presence of a responsible person from the employer during unloading.

Providers responsibilities:

- Ensure the presence of a responsible person on the Providers’s side for unloading;
- Provide personnel for unloading equipment, table 4.1;
- Provide equipment for unloading equipment. table 4.1.

Table 4.1 Requirements for unloading main equipment

		Requirements for the number of machines	Requirements for the number of drivers and workers
1	BESS enclosures	unloading quantity minimum 8 containers (20ft) per day	
2	Inverters, medium voltage transformers	unloading quantity minimum 7 MVS`s and 14 inverters	
3	Other equipment and materials	unloading quantity minimum 4 containers (20ft) per day	

4.2 Quality for Materials and Workmanship

The Providers shall guarantee that all materials used for the execution of the works are new, the best of their respective kind for the intended service, free from inherent defects in workmanship and material and that all equipment and its components will operate successfully at the intended capacities up to and including the maximum specified load without undue noise, heating, straining of parts, wear and vibration and that an ample safety factor is included in every design.

The entire works shall be designed to ensure satisfactory operation. During the preparation of the detailed design, all reasonable precautions shall be taken into account to ensure the safety of all involved personnel and the public during the planning, construction, and O&M phases.

All workmanship shall be of the highest class throughout and the design dimensions and materials of all parts shall be such that the stresses to which they are subjected shall not render them liable to distortion or damage under the most severe conditions encountered during the entire operating time.

The detailed design shall be implemented in a way that inspection, cleaning, repair works and other actions related to O&M are facilitated.

All installations shall be designed to ensure satisfactory operation under the prevailing atmospheric conditions of the location where the BESS plant will be constructed and under variations of load and voltage, which may occur within the system's working conditions.

All components of cable lines such as conductors and cables, supports, insulations and fittings should be designed in a way that the risk of damages during the foreseen operation time is minimized.

Defective parts shall be replaced with new parts. If a repair of defective parts is considered to be reasonable by the Providers, he shall elaborate a repair procedure for the defective parts. Only the Employer's written approval of the repair procedure allows the Providers to conduct the repair works according to the agreed procedure.

Corresponding parts of equipment liable to renewal shall be fully interchangeable and the Providers will be required to demonstrate this feature to the Employer's satisfaction.

4.2.1 Castings

All castings shall be as free from blowholes, flaws and cracks as it is practicable.

4.2.2 Welding

Before any welding works commence, the Providers is to satisfy the Employer that the welders or welding operators are qualified in accordance with the requirements of the appropriate section of IEC, EN, and/or local regulations.

The Employer or his representative reserves the right to visit the Provider's works at any reasonable time during execution of the items of plant and to familiarize him with the progress made and the quality of work to date.

4.2.3 Galvanizing

All iron and steel used in the construction of the contract works shall be galvanized after all sawing, shearing, drilling, punching, filling, bending and machining is completed. The zinc coating shall be uniform, clean, smooth and as free from spangle as possible. Galvanizing shall be applied by the hot-dip process and shall withstand the tests set out in the standards as may be approved for all parts other than steel wires.

Corrosion protection has to be determined and recorded.

An approved process shall galvanize all steel wires before stranding. The zinc shall be smooth, clean, of uniform thickness, and free from defects and shall withstand the tests set out in IEC Publication 209 or such other standard as may be approved.

The Providers has the responsibility to properly protect all galvanized material until it is fully assembled on site. Any damages on the supplied material, which occur during transportation, handling or construction, shall be repaired by the Providers at its own expenses if the damaged part appears to be capable of repair in the opinion of the Employer. Otherwise, if any galvanized part is found to be imperfect and incapable of repair, it shall be replaced. The Providers shall bear the whole of the expense involved in the replacement of the imperfect part.

The replaced or repaired parts are subject to re-inspection.

4.2.4 Maintenance tools

Within the scope of the contract, the Providers must add the relevant rates and prices for the required maintenance tools along with the relevant rates and prices for any special items.

The required maintenance tools and appliances must be clearly marked with their size and/or purpose and must not be used for erection purposes by the Providers.

The tools and equipment with the appropriate boxes are to be handed over to the Employer at the Employers' storage at the time of arrival at the site and not later than the signing of the completion certificate.

4.2.5 Spare parts and material

Any spare material ordered by the Employer must be delivered directly into the BESS storage area as may be nominated by the Employer and delivery will not be deemed to be complete until the Providers has opened packaged material and the content has been checked by a representative or has been assembled into units at the Employer's option.

Spare materials in triplicate shall be arranged for the easy identification and checking of material and presented to the Employer at the handover. Prior to the handing over date for contract spares, the Providers shall be responsible for all security arrangements and the safe custody of the spare materials, unless they have already been delivered and accepted by the Employer at a store on the site. The Providers shall obtain a receipt for all material handed over to the Employer.

4.2.6 Bolts and nuts

Members of lattice steel structures shall be secured by means of bolts and nuts with approved spring washers. All bolts and nuts shall conform to IEC standards. Nuts and heads of all bolts shall preferably be of the hexagonal type. Nuts (except for the lock nuts) shall be full bearing on one side.

All bolts and screwed rods shall be galvanized, including the threaded portions. All nuts shall be galvanized with the exception of the threads, which shall be oiled. The nuts of all bolts attaching insulator set droppers, U-type bolts and earth conductor clamps to the structures shall be locked in an approved manner. The screwed thread of any bolts or studs shall not form part of a shearing plane between members.

Where, for any type of support, high tensile steel bolts are employed, then bolts for this type are to be used for all connection for every type of support on that line in order to avoid the use of mild steel bolts in error where high tensile type should be employed.

Nuts shall be finger tight on the bolt and will be rejected if they are considered to have an excessively loose or tight fit in the employer's opinion. Bolts with threads re-tied after galvanizing will be rejected.

The Providers shall request his Supplier to select two samples of each type of bolt and nut to be used in the Contract and send these two samples to the Employer at his Project Office for approval within one month of the date of issuing the sub-order. The Employer will then reject bolt consignments, which fall in any respect below the standard of samples submitted and approved.

4.2.7 Labels, Ratings and Nameplates

All labels, circuit names and rating plates shall be inscribed in English and Romanian. The material used and inscription size of all lettering shall be subject to the approval of the Employer. Labels using adhesive-backed plastic materials will not be permitted.

All equipment and installations shall be clearly labeled in an approved manner.

4.2.8 Lubricants

All equipment which needs lubricants shall be lubricated according the requirements of the manufacturer. The required lubricants and additional lubricant which shall be sufficient for the entire guarantee period shall be supplied by the Providers.

4.2.9 Warning Signs

Supply of warning signs (movable and fixed) weather-proof in Romanian and/or English language according the local standards with pictogram. All warning signs shall be in a sufficient number for use during the rehabilitation measures and later the operation of the substation.

Movable warnings signs should be supplied and positioned in order to mark and secure ongoing work in the substation (by the Providers and/or Employer). All moveable warning signs shall include all necessary stands/racks and/or re-attachable fixing material.

Fixed warning signs shall be supplied and installed including durable fixing material.

4.2.10 Padlock System for Electric Switchboards

For the outdoor switchboards shall be provided with a padlock system of high-quality anti- corrosive. Two kinds of mechanical locks (separately for drives cabinets and for equipment control cabinets at outdoor switchgear) that may be opened by separate unified keys, as well as enough number of spare keys shall be provided.

4.2.11 Sealing

Rubber sealing shall be of high-quality, non-aging material, which will not be affected by humidity, heat and temperature variations. The supplier has to proof the quality and lifetime by certificate.

Where synthetic sealing material is used, with or without flour carbon coating, the supplier has to submit the manufacturer's name and the relevant data for approval.

4.3 Electrical Equipment Specifications

New equipment of modern design with a required lifetime of minimum 30 years should be used.

All equipment to be installed as well as the steel structures shall meet the highest available international quality standards according to the applicable related norms.

The equipment, materials and spare parts supplied from abroad have to be certified in Romania.

The offer shall reflect the major requirements like largest possible uniformity of all major components, easy replacement and repair, highest degree of maintenance free equipment, service safety and availability.

The equipment and devices shall be factory-assembled and tested at the manufacturers' works if the case. All the equipment, accessory, measuring devices and materials to be supplied must be new, not previously used, be of standard design of the Manufacturer. They shall be developed with respect to the latest requirements of the normative documents and constructed based on the use of new technologies.

In addition to the risks and liabilities in accordance to delivery conditions Providers will bear all costs and risks associated with off-loading, storage at site and transportation on site to the installation place of plant and equipment.

Parameters of the Electrical System

The following voltage levels have to be considered in the design:

- MV 3-phase 33 kV (distribution voltage levels)
- LV AC 690 V (low voltage distribution voltage level)
- LV AC 380/220 V (low voltage distribution voltage level)
- LV DC 0-1500V (low voltage distribution voltage level)

Insulation Coordination

All cable and wire products, as well as its insulation, which will be used in the project, must comply with the national standards of Romania and the standards of producer countries.

Medium Voltage Switchgear (33 kV)

General

The Providers shall design, install and commission medium voltage switchgear and all associated ancillary equipment.

The 33kV switchgear as part of the 33/0.69kV transformer substations is supplied by the employer. Providers performs design, installation, adjustment and commissioning.

Power Cables

General

The Providers shall, supply, and install all cables, which are necessary functioning of a fully operational substations, including all MV, LV, as well as all control and communication cables. All costs for the design, transport, handling and installation of the cables and their accessories shall be included in the Proposal price.

Installation of the power and control cables along the territory of the substation shall be performed in in the concrete cable trays. To prevent influence of magnetic fields on the control cables caused by power cables, the power and control cables shall be laid in separate routes, at the distance one from another. For laying of control and power cables between premises, a cable floor has been designed under the panels.

Power and control cables shall be non-combustible.

The scope of supply, laying and connection of the cables shall include but not be limited to:

- all necessary cables and conductors for power supply to the instrument transformers, control, measurement and alarm system and so on;
- all necessary number tags for cable identification (numbering will be specified in design);
- all necessary fasteners;
- all necessary fire-protection materials for insulation of cable openings in the walls, between switchgear units and cubicles of control, measurement, recording systems, and control panels etc.;
- all necessary PVC protective pipes for cable routes;
- all necessary materials for cables laying in the ground;
- all necessary cable connections, including gas-filled cable caps, fasteners and clamping materials etc;
- all necessary sealed terminal boxes and cable splice boxes, including fastening materials;
- all necessary press-fit connections;
- all necessary cable glands.

The warranty period is- not less than 5 years from the date of putting into operation.

The XLPE cables for the project have to be designed according to the requirements in the specifications and technical data sheets:

Current ratings shall be calculated in accordance with IEC 60287 "Calculation of the continuous current rating of cables with 100 % and 70 % load factors".

Cable Construction

The cable shall be of single core construction, made up of highly compacted, stranded conductor of copper, XLPE insulated, suitable for use in system with rated system voltage.

The conductor shall be made of aluminum wires and executed as circular, stranded conductors. The conductors shall be longitudinal watertight.

The conductor shall be clean and free from metallic and foreign particles, which may contaminate the insulation or cause high stress points.

The conductor screen shall be non-metallic and shall consist of a layer of black extruded semiconducting compound.

The outer surface of the conductor screen shall be cylindrical, smooth and free of protrusions and irregularities. The outer surface of the conductor screen shall be firmly and continuously bonded to the inner surface of the

insulation and shall have no tendency to separate from the insulation due to the effect of bending during installation, load cycling and short circuit under service conditions.

The insulation shall consist of a homogeneous extrusion of cross-linked polyethylene (XLPE) complying with the requirements specified in IEC-60840 recommendations.

The cross-linked polyethylene insulation produced shall be free from micro voids, contaminant, protrusion and moisture content as specified in the above standards.

The insulation screen shall be non-metallic and shall consist of an extruded layer of black, thermo setting semi-conducting material applied directly over the insulation.

The inner surface of the insulation screen shall be smooth and free of protrusions and irregularities.

The inner surface of the insulation screen shall be firmly and continuously bonded to the outer surface of the insulation and shall have no tendency to separate from the insulation due to the effect of bending during installation, load cycling and short- circuit under service conditions.

The core shall be taped overall with semi-conducting tape(s) to prevent mechanical damage to the cable core during manufacture and in service.

The screen shall consist of copper wires and one or two copper conducting tape spirals. The screen wires shall lie in a long lay directly over and in close contact with the insulation screen. The tape spirals shall be applied in counter helix over and in electrical contact with the screen wires.

The dimension of the copper wire screen shall be fully compatible to the respective design of the overall cable construction.

Cables shall be provided with water sealing of conductor and longitudinal water sealing along the metallic screen.

The longitudinally water barrier will limit the water penetration along the power core in case of cable damage

The radial water impervious sheath shall consist of a seamless and continuously Aluminum tape. The metallic sheath shall be impervious to moisture, tightly fitting and free from defects and impurities such as oxides that could give rise to failure under working conditions. The metallic sheath shall also have good creep ductility to provide the necessary mechanical strength for the cable due to the effect of bending during installation, load cycling and short circuit under service conditions.

The outer covering shall be of high-density polyethylene (HDPE, and suitably prepared against cracking and decomposition under the prevailing service conditions at site. The outer sheath shall be covered with a black semi-conductive layer.

Spare Cables - Sealing and Drumming

For all spare cut lengths of cable which are to be delivered to the Employer's stock, approved sealing caps of correct sizes shall be supplied and properly mounted immediately after the respective cable length is cut. The drums shall be marked in English/Romanian to indicate the direction of rolling, and also as stipulated in the Special Conditions of Contract, Shipping Marks, plus the following:

SIZE AND TYPE OF CABLE, VOLTAGE, CABLE LENGTH

All cables and conductors shall have the inner ends brought out and suitably fixed to the drum to avoid any damage during handling or pulling operations.

The cables shall be rolled on strong wooden or steel drums provided with suitable wooden battens to protect the cables from damage. They shall also be suitable for storage in the open air without additional protection by casing or shutters for a period of at least two years.

Sealing Ends

MV sealing ends for power cables of appropriate size and type are required for connection of switchgears, GIS, and transformers. The terminations shall be suitable as necessary for use on switchgear, transformer cable boxes designed for either compound filling or air clearance (without compound) and overhead line termination.

The design of cable sealing ends has to be closely coordinated with the supplier of the equipment, the cable has to be connected to, and the manufacturer of the cable.

Cable trench

Single-core MV power cables shall be labeled to maintain phasing and destination identification and carefully laid on top of sand bedding material that has been placed in the bottom of the trench.

Cables shall be laid to facilitate the phasing of connections at the point of termination. Multiple runs shall be marshaled so that the cables entering or leaving the run do so in an orderly and logical manner.

Multicore LV power cables shall be labeled to maintain destination identification.

Low Voltage Power Cables

All LV power cables to be supplied shall be connected to the relevant station equipment in an approved manner, including all necessary wiring. Their spare cores shall be terminated and marked for future extensions. The cores shall be connected to terminals as such that crossovers are avoided.

Insulation of extruded black flame retardant PVC, with particular measures against decomposition in the climate at site, or alternatively XLPE.

The color coding for the protection earth cables shall be yellow or green.

Control Cables

Multicore control cables shall be labeled to maintain destination identification.

All control cables to be supplied shall be connected to the relevant station equipment in an approved manner, including all necessary wiring. Their spare cores shall be terminated and marked for future extensions. Multi-core cables shall be connected to terminals as such that crossovers are avoided.

A distinctive marking, including the following details, shall be embossed continually along with the complete outer covering:

- Manufacturer's name and/or trademark
- Year of manufacture
- Marks one meter apart, showing the cable length

Outdoor Lighting

The total outdoor lighting system shall be switched from the gate by key switches and from the control room by main switches and/or photocells connected to the branch circuit in the low voltage distribution panel.

The poles shall have installed cable end boxes and fuses, including cables connected to the lighting fittings. All lighting fittings shall have reflectors.

All cabling along station walls such as for sockets, thermostats, switches, bells, telephones, etc. shall run either in conduits or as concealed wiring. Surface-mounted cables are inadmissible.

The lighting system of the outdoor part of the plots shall be implemented using the most advanced floodlights with LED bulbs.

Grounding and Lightning Protection

The Providers shall design, install and test the grounding and lightning protection systems for the new substations. This will include, but not be limited to, the following:

- All grounding and internal earth busbar(s) at the building;
- All interface grounding requirements between grid connection infrastructure and Site electrical system;
- Preparation of a lightning

The Providers shall carry out soil electrical resistivity tests to the extent necessary to establish the actual values upon which grounding calculations can be based. The Providers shall prepare and submit detailed calculations/study reports of the design of the substation components and lightning protection. The Providers must ensure the installation of the grounding system in accordance with the Grid Code and other regulatory standards of Romania.

Earthing devices shall meet all requirements of electrical safety of staff, protection of electrical installations and operational modes.

Each component of electrical plant to be earthed or neutralled shall be connected to earthing terminal or main earthing point by a separate protective earth or neutral conductor.

Earth conductors shall be connected to earthing terminal and earthed structures by lap welding, and to the plant enclosures- by bolts. Each earthing clamp shall be accompanied by an earthing sign made in compliance with requirements.

Earthing down conductors from equipment with connections to earthing loop shall be made of steel strips. Earthing down conductors shall be protected from corrosion by heat-shrinkable tubing at "ground-air" places.

Horizontal earthing bars shall be laid along axes of electrical equipment on the maintenance side at 0.7 m depth from ground surface at the distance 0.8-1.0 m from equipment footing. The Providers shall lay earthing mesh around and inside buildings, which shall be connected with the common loop of substation earthing system. Earthing loop laid inside the building shall be connected at least in two points to the external earthing loop laid around the building. Steel non-conducting parts of equipment and foundation reinforcement bars shall be connected (during construction) to the earthing loop of the substation.

After erection, before ground backfilling, the Providers with Employer shall inspect earthing devices for conformity to design requirements and shall issue a certificate of inspection.

During commissioning of earthing devices of electrical equipment, the Providers shall submit to Employer the following documents:

- as-built drawings of earthing devices;
- data on earthing devices components;
- certificates of concealed works;
- acceptance test reports.

Scope of construction of switchyard lightning protection is defined during the design stages.

Overvoltage protection according to electromagnetic compatibility measures for sensitive devices shall be considered to providing during detailed designing and, if necessary, included in the scope of supply.

For the buildings, a separate lightning protection consisting of air terminals and conductors or lightning protection grid shall be provided and to be connected to the earthing system.

Corrosion Protection

In general, all hardware and accessories shall be made from corrosion-proof materials. When selecting the materials for support structures, fittings, and grounding equipment, particular attention must be paid to

corrosion resistance. Selection and employment shall be made so that under working conditions no detrimental corrosion, distortion, deterioration or excessive strain in any part of the equipment may occur.

All contact surfaces on the gantry stubs, connectors, rods, strips and wire leads shall be thoroughly cleaned prior to assembly to avoid corrosion.

Machined or bright surfaces of the parts which are to receive no coat of paint shall be protected during storage and erection by a suitable corrosion protective compound as e.g., Tectyl.

The Providers has to guarantee a lifetime of the corrosion-protection of galvanized structures at least 20 (twenty) years.

Auxiliary Materials

All auxiliary material required for operation and safety, even if not explicitly specified, shall be considered and included: all types of auxiliary relays for control, protection, alarms, contact multiplication etc. as well as terminals, wiring material, sensors, measuring instruments, cable trays, cable pipes, insulators, copper bars, insulating elements etc.

4.4 Security system

Within the framework of this Project, the Tenderer must ensure the implementation of an integrated security system for the site BESS, taking into account the following requirements:

- Development of a comprehensive security and technological video surveillance system.
- Parameters and composition of the equipment of the Integrated system should provide constant round-the-clock control over the perimeter of the site BESS, its territory and technological equipment, authorized access to the territory, the premises of the WS, the issuance of an alarm to the operator's workstation in the absence of the security guard's facility and to perform the following functions:
- Automated fixing of audio and video information of events on the territory of site BESS. To provide consistent information about the state of the perimeter of the camera video surveillance, set every 50-70m.
- In violation of the perimeter, provision should be made for the issuance of a siren signal in the 120 dB.
- Record video information by video camera by performing motion detecting of objects and 3 minutes after.
- Automated notification of system users about important and non-standard events. Including detection of unauthorized access to the territory and in the premises of the plot and the transmission of an alarm. The user list must be agreed with the Employer.
- Automated video monitoring in real time around the perimeter of selected technological elements in the territory of the solar field.
- Automatic replication of collected object data to the central server of the system in the EU with a depth of archive of 90 days.
- Video recording should be performed on fault-tolerant storage at the PS.

- The automated formation of integrated generalized reports should be carried out.
- Automated control of access to plot territory, (control room, servise building etc.). Control of access of the Employer and visitors to the archives in 90 days.
- opening of entry gates.
- Transmission of a visitor signal to the subsystem controller with the possibility of automated opening of the entrance gate or checkpoint doors.

• An emergency power supply must be provided to ensure the uninterrupted operation of the alarm equipment.

• The Contractor shall execute the fence and security lighting along the perimeter of the plot, taking into account the following requirements:

• Provide for construction of the external fence:

- Number of rows of fences - 1.

- Fence height:

total - 2500-2600 mm;

Flat mesh fence - 2000-2100 mm.

- The diameter of the barbed-cutting spiral barrier is 500 mm or similar;

- Fence type: Welded 3D panel with a height of 2000/2100 and a length of 2500 mm, green color (Ral 6005), diameter of rods = 4 mm, with zinc and PVC coating, cell size 50x200 mm;

- Pillars 2500x60x40, green color (Ral 6005), metal thickness = 2 mm, zinc and PVC coating.

- A barbed-cutting spiral barrier with a diameter of 500 mm should be installed.

- Entry gates for objects must be open-ended, with automatic control and use of fully appropriate main fence materials. The height is 2000-2100 mm.

- A wicket with a height of 2000-2100 mm, a width of 1000 mm, must also be made of materials used on the fence.

• Security lighting must be made around the perimeter of the solar field with lamps with LED lamps that are mounted on the brackets on the steel supports. The number of fixtures should be determined from the calculation of minimum illumination of 0.5 Lumen. The absence of "dead" (unlighted) zones should be ensured when performing video surveillance.

• Security lighting should be in the off state and automatically activated when the alarm sensor is operating at the area of the perimeter of the substation, where the penetration occurred.

• For the purpose of checking the state of security lighting at night, provide manual control of the space of the room on the substation.

• Ensure the power supply of the security lighting network from the individual LEDs of the work lighting network.

4.5 Civil work

General

Initial geological and geodesical surveys will be provided by the Employer.

If the soil- and/or the groundwater investigation shows an unacceptable degree of aggression special measures like increased concrete cover, application of protective membrane or special concrete resisting to chemical aggression shall be used. A report proposing the adequate measures has to be submitted to the Employer prior the start any activity.

The Providers is responsible for mark the construction site in-situ based on geodetic survey data. In case if geodetic survey data do not correspond to the actual marks and levels the last mentioned shall prevail for design and construction.

The Providers shall perform excavation and backfill of soil for buildings, foundations, roads, levelling the surface etc., backfill works including compaction.

The Providers shall perform excavation and backfill of soil for pipelines, cables, earthing ditches.

The Providers shall perform construction fence, access and internal roads, foundations for equipment, building construction, storage areas and construction camp.

After the constriction and installation works are finalized the soil reclamation of temporary sites shall be performed.

The Providers is responsible for the preparation of the construction areas and for all site and assembly equipment. It also includes at the site the preparation of accesses, work and storage places, water and site electrical power connections, waste water, safety facilities as well as adequate sanitary facilities.

The Providers shall organize the wastes gathering, safe temporary storage and removal in conformity with the requirements of valid legislation of Romania.

For detailed scope of work, see “Section 4 – Bidding Forms. Schedule of Contract Prices”

Concrete works

Standards

All concrete structures shall be designed and constructed following the applicable norms and standards, as following (or other relevant EU standards for concrete):

- DIN EN 206 Concrete
- DIN 1045 Concrete and Reinforced Concrete
- DIN 488 Reinforcement
- DIN 1164 Cement
- DIN 4226 Aggregates and Admixtures
- DIN 4227 Pre-Stressed Concrete
- DIN 1048 Quality Control
- EN 12620 Aggregates for concrete
- EN 13055 Lightweight aggregates

Concrete

The concrete formula for the main equipment foundations is the matter of approval with the Employer.

The composition of concrete mixture shall indicate aggregates, cement, water and additives, if any, quantities in kg per m3 of compacted concrete and its expected properties, namely:

- concrete grade and strength
- type and amount of cement
- free water cement ration W/C and the water content
- type and quality of aggregates
- Type and quantity of admixture, if applicable

All concrete shall be machine mixed. Adequate trial mixes of the proposed concrete mixes have to be carried out, and the batching plant has to be approved by Employer prior to the start of works.

Manufacturing and transporting as well as pouring and curing the concrete, formwork, falsework, stripping, propping and installing and placing of reinforcement shall conform to the applicable norms and standards (DIN 1045).

The Providers shall certify that the proposed cement is of required quality regarding resistance to corrosion due to sulphate or other soil constituent. Methods of testing this quality shall be included in the design.

Delivery and Pouring

Concrete shall be transported from the mixer to formwork as rapidly as practicable by methods that will maintain the required workability and will prevent segregation of concrete or the ingress of foreign matter or water. The concrete shall be deposited as close as practicable to its final position. Truck mixers shall be completely discharged within 60 minutes after the water has been added to the mix, from other vehicles concrete shall be completely discharged within 20 minutes. The concrete shall be placed before the cement takes its initial set and as indicated in the drawings.

Concrete shall not be placed until the positioning and fixing of reinforcement and any other items to be embedded. The alignment and the suitability of the formwork have been examined and approved by the Employer. If possible, concrete shall be placed and distributed by hand spading and tamping.

Concrete shall be deposited as closely as possible in its final position to avoid to avoid re-handling or moving the concrete horizontally by vibration and to avoid displacement of the reinforcement or other embedded items or formwork. Concrete shall not be dropped from a height of more than 1.5 meters, and layers (in terms for vibration) of concrete shall not exceed 400 mm. No concrete shall be placed into flowing water.

At ambient air temperatures below -3°C the temperature of the concrete at the time of application shall be at least +10°C. After that it shall be kept at this temperature for at least 3 days. At air temperatures between +5°C and -3°C the temperature of the concrete at the time of application must be not less than +5°C.

Roads

The Providers must construct roads and maintenance sites that fulfill the Employer's requirements (part 5 to Section 6) and design documentation.

The roads shall be made of the following composition:

- Gravel filter layer
- Gravel supporting layer

The top of the roadway must be in line with the level of planning

Determining the constructive dimensions of the road is carried out taking into account the characteristics of the soil and the load from the vehicle. Transverse and longitudinal deviations are performed according to the standards and specificity of the relief.

Design shall ensure sufficient rainwater management all over the site.

The Providers shall verify the compliance with the required compaction and bearing capacity for each layer of road pavement. Tests shall be carried out according to the Requirements and design documentation. Compaction tests should be performed via plate load tests according to the applicable testing standards and regulations. The plate bearing tests shall be carried out prior to the start of transformer installation works and protocols of the tests shall be submitted to the Employer's Representative for review.

The following information shall be delivered to the Employer's Representative:

- Grain size distribution curve
- Quality data sheet
- Test of compression resistance (plate bearing test)

4.6 Training

If the operation of the supplied equipment requires licenses (certificates) from the manufacturer or a third party, then the Providers is obliged to conduct the appropriate training of the Employer's personnel, if the case.

The Providers shall specify the number of Employer's personnel and type of supplied equipment for which the training will be conducted and specify the site of training.

The Employer's personnel training for the primary equipment:

- shall be conducted on the site during the installation and adjustment of the equipment.

The training program is subject to approval by the Employer. Upon completion of training, participants should receive certificates for the right to self-maintaining the equipment.

Organization of training for maintenance services should include general operational issues, precautions, testing, and maintenance, as well as personnel actions in case of malfunction

4.7 Auxiliary work

All and any kind of work, material, services, safety measures, etc., as well as, and if so requested by the Employer, all tests and samples required for the completion of the work shall be included in the Tender.

The auxiliary work comprises, but is not necessarily limited to, the following:

- removal and storage of boundary stones, bench marks, etc.;
- protection of survey points, designations by means of boards;
- survey and protection of all secondary survey points, profiles, etc.;
- solution of difficulties where excavation may have to be carried out in layers;
- keeping off or diversion of water, including any pumping required, difficult work caused by water, etc.;
- removal of any groins, buried pipes, wattle work, fascines and the like which might interfere with excavation profiles, irrespective of whether or not such structures are specified in the Tender Specifications;
- solution of difficulties resulting from the Tender Specifications with regard to fills, compaction tests, elimination of unsuitable material from fills and, if necessary, mixing of different soil materials;
- transport of excavated material to fill or deposit, placing and spreading in layers according to conditions and drawings, and careful compaction;

- solution of difficulties in transport due to existing ground conditions;
- grading of intermediate and top fill surfaces and slopes to final levels required;
- sorting of excavated material which, if necessary, is to be used for special purposes;
- any expenditure for provision, maintenance and later removal of driveways; maintenance of existing ways and roads: provision, placing, maintenance and later removal of conveying and dumping equipment which might be required;
- measurements for the execution and payment of the work, including provision of the measuring equipment, gauges, marking-out pegs, etc., the maintenance of the gauges and marking out pegs during building construction, and the engagement of labor;
- provision of small equipment and tools;
- transport of all material and building components, from the stores on site to the points of use, and possible return transport;
- supply of all required materials;
- securing the work against surface water, which must normally be reckoned with, and its removal grouting of pre-cast concrete units insofar as building in of precast concrete units appertain to the labor of the Providers;
- raking out of slots, small openings and the like, insofar as this is provided for in the Tender Specifications according to type, size, and number of the rakings out, and the details are notified in good time;
- protection of the placed concrete against heat, wind, cold, chemical attach, vibration, and drying outwork of proofing the quality of the building material and of the concrete in accordance with all of the requirements of the Tender Specifications;
- test loads according to standards and as laid down in this chapter if the contractual quality of the work cannot be proven by other methods;
- removal of all pollution resulting from the Providers's work, and of the Providers's debris;
- protection of the completed works and the articles handed over for construction against damage and theft until acceptance;
- arrangement of any kind of joints required;
- fixing of embedded parts in proper position, material supplied by the Providers and/or others;
- provision of blockouts, grooves, rabbets, recesses, openings, etc., in accordance with the working drawings and/or as directed by the Engineer;
  apparatus, equipment and tools required for testing

Lazar Laura

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