



GEORGIA  
HEALTHCARE  
GROUP

TBILISI/GEORGIA  
SUNSTONE HOSPITAL

## FIRE DETECTION AND ALARM SYSTEMS TECHNICAL SPECIFICATIONS

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### Employer

Evex Healthcare Group – TBILISI/GEORGIA

*prepared by*



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## TECHNICAL SPECIFICATIONS

### 1. General Information

- 1.1. Georgian healthcare provider Evex Healthcare Group (hereinafter referred to as Employer) intends to contract out "Fire Detection and Alarm Systems" works at Sunstone Hospital building in Tbilisi. For building the system, supply, assembly and production of the materials having at least the specifications stated herein and attached shall be carried out and the system shall be delivered, in operational state, according to the technical specifications and the relevant standards.
- 1.2. These specifications reveal technical features and details that need to be respected to perform the said work.
- 1.3. Within the scope of "Fire Detection and Alarm System", Contractor shall provide material supply, installation and engineering services, constructional works as a package, to ensure delivery of the system, in operational state, according to the standards mentioned within this technical specification and in accordance with specific approved/listed system details which shall be submitted by the contractor.
- 1.4. In this scope, the employer may appoint a certified organization as an auditor to control the company that it shall do business with, following the issuance of the work after the tendering process and procurement works. This organization shall have all the powers held by the employer.

### 2. Purpose of the Work

- 2.1. The system, which shall be delivered in working condition, shall work as a whole, shall detect the fire with unquestionable accuracy, provide detailed information including location and time information to assist the intervention, and have audio visual (horn strobe) alarm devices that can alert people in the vicinity or in the area, fully automatic, requiring little and easy maintenance shall be able to report possible errors and work continuously.
- 2.2. All works, materials to be used, system solutions, in accordance with the fact that the facility to be established is an industrial facility with high national and international standards, shall be carried out at the highest level of technical safety and reliability, thus protecting these areas from fire.
- 2.3. The technical specification sets out the general conditions and structure of the Fire Detection and Alarm System to be installed. Before the installation, the application drawings including the assembly details and the delivery after the assembly, the optimized system infrastructure in accordance with the structural characteristics of the material provided, the construction of the projects, all kinds of system improvement works are considered within the scope of the work.
- 2.4. The system and system elements that shall serve the specified purpose are described with specifications and shown in the specification annexes and drawings, which are an integral part of the specifications.
- 2.5. With the Fire Detection and Alarm System to be provided, being aware of the initial stages of a fire that may occur in the facility, and obtaining accurate and reliable information from the fire detection and alarm system completely free of false alarms are among the main objectives.
- 2.6. The entire system to be configured in the facility shall work in a way that can communicate with each other, the structure that shall be created by using the existing system components should form a harmonious whole that shall ensure uninterrupted communication.
- 2.7. System and system components, which shall serve the specified purpose, shall be aimed to have an economic life of 20 (twenty) years, and all the necessary elements to achieve this shall be fulfilled completely.

### 3. Scope of the Work

- 3.1. The system that shall serve the specified purpose is shown in the specifications and drawings attached to the specifications.
- 3.2. Including work, material and workmanship, it shall be carried out as assembled, delivered in accordance with the turnkey requirements. All kinds of materials, installations, workmanship required for the system to provide the desired fire protection and deliver it in working condition, whether or not specified in the projects or technical specifications, shall belong to the Contractor.
- 3.3. The content of the work is collected under the following main headings:
  - a) All kinds of materials, installations, labor etc. required for the delivery of the system in working condition. provision of services and supplies,
  - b) Establishing the electrical infrastructure (cabling, energy distribution, assembly) related to the system
  - c) Procurement and installation of automatic fire detectors (Smoke, heat, combine and duct type) throughout the facility, connecting to the Fire Detection System,
  - d) Procurement and installation of manual fire alarm buttons throughout the facility, connecting to the Fire Detection System,
  - e) Procurement and installation of audio visual (horn strobe) alarm devices throughout the facility, connecting to the Fire Detection System,



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- f) For outdoor use, procurement and installation of outdoor weather proof devices, connecting to the Fire Detection System,
  - g) Ensuring that the Fire Detection Panels (existing (2ea.) and new (2ea.) ones) can be digitally and continuously communicated with each other and with the Graphic Monitoring System,
  - h) Ensuring the monitoring of the extinguishing system valves throughout the facility, connecting to the Fire Detection System,
  - i) Supply and installation of modules for controlling the ventilation system and electricity throughout the facility, connecting to the Fire Detection System,
  - j) Drawing shop drawings of the system,
  - k) Repair of damaged places (walls, columns, panels, etc.) during operations,
  - l) Tests of the system,
  - m) Commissioning,
  - n) Submission of documents,
  - o) Providing all kinds of complementary support such as training, as-built drawings, warranty services, which are necessary for the established system to work properly,
  - p) Delivery of the system in working condition,
  - q) Carrying out all kinds of warranty and maintenance services with the 2-year intervention guarantee of the system,
- 3.4. All unit prices given shall be the prices of the assembled material, and in case of any future decrease or increase, these prices shall be taken into consideration. All kinds of complementary-assembly materials and labor that do not have a unit price are included in unit priced materials.
- 3.5. The supply of work safety materials, assembly or assembly auxiliary materials (ladder, stand, etc.) to be used during the construction of the work shall be provided by the Contractor.
- 3.6. All kinds of drilling, excavation, disassembly required for the construction of the work and the necessary renovation works after these are included in the work and belong to the Contractor.
- 3.7. The scope of work includes the establishment of the system, ensuring its complete operation, providing documentation and training requirements, and providing warranty and maintenance services for the specified period.

#### 4. Related Standards

- 4.1. Works to be done shall comply with international fire protection and fire safety protection rules and standards. Furthermore, all relevant standards incorporated by reference in this standard, shall prevail with the same validity. In this context, the standards to be valid and applicable in design, installation (assembly), commissioning, trial and acceptance process are;

EN European Norms (EN 54-14)

NFPA National Fire Prevention Association (NFPA 4, 70, 72 and 90A) – *If require*

UL Underwriters Laboratories (UL 228, 268, 268A, 464, 497A, 497B, 521, 864, 1283, 1449, 1638, 1971, 2034, 2075, Fire Prot Dir) – *If require*

Local Code

EN or DIN or VDS Approvals

- 4.2. The listing of systems and applications are intended as potential applications that may be reflected by the project's scope of work. The Contractor shall be responsible for reviewing the required existing through-system penetrations and the rated system being penetrated to determine appropriate systems required.
- 4.3. No matter which of the above-mentioned certifications the products bear, they shall be submitted to the material approval, notwithstanding the certifications they have, and the administration shall investigate whether they are compliant with where they shall be used. Only after the material approval by the employer, supply and installation of such materials shall be permitted.
- 4.4. Even if the changes are highlighted during the proposal phase, and if the Employer does not accept in writing or even if they are accepted and/or installed but deemed to be non-compliant afterwards, such non-compliant material(s) shall not be accepted unless they have the required material certifications.
- 4.5. If any existing detail is not in conformance with the previously tested system by the manufacturer than an Engineering Judgement published and signed by the manufacturer's Registered Professional Fire Protection Engineer or by a NFPA Certified Fire Protection Specialist would be acceptable depending on the 3<sup>rd</sup> Party Reviewer and/or Employer approval

#### 5. Related Product Approval



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- 5.1. All system elements to be provided shall be EN (European Norms) approved, another approval shall definitely not be accepted. A self-declaration issued by the manufacturer or a certificate of conformity issued by a laboratory for EN (European Norms) compliance shall not be accepted.

In this context, the main applicable standards are as follows

- EN 54                                      Detection and Alarm Systems Standards Series
- IEC 331                                   Cable Insulation Continuity
- IEC 332.1 ve ICE 332.3              Cable Flame Test

- 5.2. Materials that are not fire system materials must have a product approval certificate obtained from IBC or an approval institution subject to approval.
- 5.3. Owned documents for the products must be specified on the catalog pages specifying their technical specifications.
- 5.4. All products shall be submitted for material approval and their suitability for the place of use shall be questioned by the Employer regardless of the approval they have. However, material procurement and assembly shall be allowed after the material approval is given.
- 5.5. Owned documents must be valid "as of the date of bidding"; Approvals and documents whose validity period has expired and not renewed shall not be accepted.
- 5.6. All materials to be used shall have CE certificate.

### 6. Projects and Drawings

- 6.1. Application drawings of the system are under the responsibility of the Contractor. The material quantities to be taken as basis in the proposal phase are given in the site lists and tables. The contractor is obliged to examine all relevant lists and tables in detail before preparing his proposal.
- 6.2. Shop Drawings and as-built drawings consisting of section and assembly details shall be drawn entirely by the Contractor after receiving the work. The Contractor, whose proposal has been approved, shall submit the manufacturing drawings prepared for each material to be used, together with catalogs containing the brand / model / approval information of the materials, to the approval of the Employer and shall only be able to procure and apply materials after approval. Employer officials have the right to request As-built Drawings, other than the one submitted by the Contractor.
- 6.3. The application can only be started after the As-built Drawings and the materials specified in the specification are fully approved, the assembly and application details are finalized and the technical information is presented. The employer has the authority to refuse to apply any material that it understands is not suitable for technical requests at any time, regardless of whether it was previously found appropriate.
- 6.4. After completing the works, the contractor shall prepare the drawings containing the "As-built" information showing the final status of the work done before the "Provisional Acceptance". As-built drawings shall be prepared to include all kinds of manufacturing details such as the entire route and assembly details. As-built drawings shall be delivered in printed form on CD in tracing output and computer output format (plt, pdf, etc.) and also in.dwg (Autocad) format. The extraction, drawing and reproduction of the as-built drawings information is entirely owned by the Contractor.
- 6.5. The engineering calculations required for the application shall be made by the Contractor and submitted for approval.
- In this framework, at least the following calculations shall be made, although it is not limited.
- Detection-Alarm System:              Voltage Drop, Cable Cross Section, Battery Capacity calculations

### 7. Work Program and Duration of the Work

- 7.1. The Contractor shall make the necessary work planning to do the work on time and submit the work program for the approval of the Employer from the date of contract, within the period of 1 month. The work program that shall be submitted shall contain the following information, in days and each individually, according to the order of priority and sequence basis, shall be specified as the actual calendar date: project, material supply time, unloading the site, power outage, hot-work time.
- 7.2. Because the work shall be held in a running facility, place of delivery, making the environment suitable to work etc. shall be considered in the construction period.
- 7.3. Contractor, in order to complete the work within the Construction Period set forth in its proposal, is obliged to provide the necessary manpower and installation team.
- 7.4. The Work Program that shall be prepared at beginning of the work shall be updated on weekly basis and submitted to the employer. Especially for the "High Security" sections contractor to inform employer and to get related work permission for the subject area.
- 7.5. Due to the high security precautions throughout the facility Contractor is subject to concomitance of an Escort assigned by the employer during all the construction period.
- 7.6. Following approval of the Work Program, in cases of failing to deliver the work place, to make decisions, to delay the approvals for reasons that may be attributed to the employer and if the contractor is not be able to perform another

work due to the delays resulting from employer, those durations shall be added to the Work Period. However, contractor may not claim any compensation from the Employer for such extensions.

7.7. Work Period shall be deemed to be started after the Provisional Acceptance and by the delivery of the work order.

7.8. The Contractor shall clearly state the period required to complete all the work.

7.9. The Contractor may ask revision or amendment of the work program content, duration and sequence

## **8. Documentation**

8.1. After the Contractor is determined, the Contractor shall submit the following documents in three sets to the approval of the Employer in order to continue the work and obtain approval for the materials to be used. The information must be in soft copy.

- Catalogs of products to be used (in English or Georgian)
- Manufacturing Plan, Section and Detail Drawings
- Product and Material List (Brand, Model, Description, Manufacturer, Supplier Information)
- Technical Data Sheets

8.2. After the completion of all works and procedures, detailed maintenance and usage instructions shall be provided for each material used in order to ensure the correct operation and maintenance of each material and element used. The package of documents shall include the following in both English and Georgian.

- As-built information (processed on the project)
- Warranty documents of the products used (obtained from the material or device manufacturer)
- Warranty documents regarding the whole system (issued by the Contractor)
- Operations Handbook / Notes documents (English and Georgian)
- Maintenance Handbook / Notes (English and Georgian)

In the event that any document from this documentation is missing or not at all, final accept processes shall be delayed by the Employer until the documentation is complete.

8.3. The documentation package shall be bound in bulk and delivered in 2 sets (Hard Copy). The information shall be provided in soft copy, on 1 set of CDs.

## **9. Training**

9.1. User, operator and maintenance training is a natural part of the job, and it shall all be done prior to Provisional Acceptance. User training regarding the operation of the system shall be given to at least two groups in the country and within the facility, and written training notes shall be distributed to the user during the training.

9.2. Regarding the maintenance of the system, maintenance training shall be given to at least two groups, and a written training note shall be given to the maintainer during the training. At the end of all training, the Contractor shall deliver a list (Training Program Form) of those who attended the training. The theoretical part of the trainings shall be carried out with the facilities of the Contractor or a representative firm, and the application part shall be carried out at the facility site.

9.3. The trainings shall be recorded with audio and video and delivered to the Employer as CD.

9.4. In case of problems related to the quality of the education, inadequacy of the educator, the level of education attained, or the insufficiency of the training documents, the Employer may request the renewal of the training partially or for all the missing parts.

9.5. The training shall be provided by people who are experts in their fields and who have received the relevant system training from abroad in case of complex systems. The training programs created shall be in parallel with the training programs of the foreign manufacturer company. The original training programs of the foreign manufacturer company shall be documented, and the training targeted in the training programs shall be shown.

## **10. Maintenance and Warranty Commitment**

10.1. The system shall be under the Contractor's Maintenance and Warranty Commitment for 2 (two) years after the Temporary Admission date. During this period, the entire system shall be cleaned and maintained at least once every 6 (six) months, within the scope of "annual trial". The content of the trials and maintenance shall be in accordance with the manufacturer's requirements and NFPA / EN standards. All kinds of labor, materials, spare parts, etc. that may be required during the maintenance and warranty period. It shall be covered by the contractor without any charge. These maintenance shall be documented and presented to the Employer.

10.2. In case of any problems other than regular maintenance and when the Employer deems necessary, the Employer may send a written notification to the Contractor. In this case, after the notification is sent to the Contractor, the Contractor shall send an authorized and expert staff with the necessary materials and equipment and carry out the works to ensure the normal operation of the system. No additional fee shall be paid for these works to be carried out under warranty. User errors shall be excluded from this situation.



- 10.3. The Contractor shall undertake to procure the materials used in the systems at market prices for at least 10 (ten) years. In addition, in the event that any material used in the system is removed from sale at the end of 10 (ten) years, it shall inform the Employer in writing at least 6 (six) months before the sale and, if necessary, undertake to provide the material at market value.
- 10.4. These commitments shall be clearly stated in the Warranty & Notarization Statement to be provided by the Contractor.
- 10.5. In addition, a typical maintenance contract sample shall be included with the offer, and a sample maintenance contract shall be submitted with the offer, with a maintenance fee of one (1) year.

## **11. Application Rules**

- 11.1. The work to be done shall be in accordance with the specified standards (See Chapter 4) and shall be in a content that shall fulfill all the requirements mentioned by these standards.
- 11.2. The work is not only the purchase of materials, but also the installation of all of the technical equipments, the supply and installation of mounting feet, taking all kinds of physical and electrical safety precautions belong to the contractor.
- 11.3. The fact that any subject or information is missing or unclear in the tender documents (specification, material list and technical specifications, project, etc.) cannot cause the work to be done to be against the standards. In case of any contradiction or hesitation, written opinions shall be obtained by consulting the Employer's officials.
- 11.4. During the work to be done, it is essential to keep the entire facility under continuous and reliable protection. The principle of "Continuity of Fire Safety" shall not be ignored at any stage of the work.
- 11.5. The principle of "Continuity of Fire Safety" is an integral part of the work, and the Contractor is obliged to consider the changes to be made in the work schedule due to this principle and the delays that may arise from it. Therefore, no additional time or fee can be requested.
- 11.6. The contractor shall work in a way that does not cause production disruption during the works.
- 11.7. The Contractor shall not perform any operation that shall cause fire hazard, such as cutting, grinding, drilling, welding, etc., which are considered to be "hot work". After the necessary manufacturing is done in the workshop or in safe areas, only assembly shall be made inside the building. Factory security units shall be notified in case of mandatory hot works encountered in connection with the existing system, and shall be worked after taking the necessary permits and security precautions.
- 11.8. The Contractor shall fully comply with the general rules and procedures of the Employer for quality control, work and worker safety, environmental protection, work permit, etc., and shall not request any additional fees for this.
- 11.9. The contractor shall perform the work as stated in the as-built project, which shall be prepared based on the Site Distribution Chart. It shall be able to make suggestions to make the job better, easier and more reliable, but for whatever reason, it shall not be able to request an additional price to the bid price.
- 11.10. Companies that shall bid for the construction of the work shall examine the location of the work and current conditions on site before bidding.
- 11.11. Each installation work shall be performed by certified and qualified personnel in full compliance with the requirements of the assembly rules. The names and certificates of the personnel who shall manufacture shall be submitted to the approval of the Designer-Consultant and Employer Project Engineer before starting work. The works shall be carried out by persons whose names are approved personally, and assistants and apprentices shall not take part in production. The Contractor shall accept the replacement of its personnel to be involved in the production as a result of a dispute with the Employer.
- 11.12. The working rules regarding the supply of all kinds of equipment such as masks and gloves, working in a closed area, welding, working at high places, and energized electrical installation specified in the occupational safety regulation shall be completely followed by the Contractor. The employer has the right to inspect and warn on these issues.
- 11.13. A meeting shall be held between the Employer and the Contractor every week or in a period determined by the parties involved, including the status of the project and occupational safety issues.

## **12. Technical Specifications**

- 12.1. Fire Detection System shall consist of analogue addressable or smart type, unless otherwise specified, addressable devices in accordance with today's technology and conditions. Smart devices mean that the alarm decision can be made directly by field personnel and based on a certain algorithm, not the control panel.
- 12.2. The Fire Detection Alarm Panel and the Repeater Panel shall be able to communicate with each other numerically and continuously and shall be able to show all system information (status, error, etc.).
- 12.3. Maps showing each addressable element shall be prepared and hung next to the Fire Detection Panel. After the maps are prepared, they shall be submitted to the approval of the Employer. Maps aim to describe the alarm / fault location more easily to the user and to increase its usage and control over the system.
- 12.4. All graphic drawings shall be suitable for this purpose, showing the cross-section of the facility plan in multi-storey buildings. If necessary, the plan drawings of the buildings whose plans cannot be provided by the Employer shall be made by the Contractor. Preparing requirements for this job, easy-to-understand line thicknesses, room divisions and graphic elements shall be used on the screen. After the graphics are prepared, they shall be submitted to the approval

of the Employer. The aim shall be to show the user the place of alarm / fault more easily, to enable programming and device usage that cannot be done easily on the panel, thanks to the computer.

- 12.5. Required for the Fire Detection Panel to reach the specified address and loop capacity, module, card, etc. The use of expansion elements is the responsibility of the Contractor.
- 12.6. Fire Detection Panel Battery capacity shall be such that it fulfills the requirements of the relevant article of EN 54-14 (Article 6.8.3) after all devices are added. Battery capacity is specified in Article 6.8.3, "If spare parts, repair personnel and a backup generator are always available in the field, the time may be reduced to 4 hours." shall be calculated considering the situation. In case of new installation, if the battery capacity needs to be increased, it shall be upgraded by the Contractor. Calculations shall be made before the offer and if the battery needs to be changed, it shall be added to the offer.
- 12.7. In the absence of line insulators in each of the devices, it shall be of a type meeting the requirements of the relevant EN 54-14 clause (Article 6.2.2.3); In other words, "in case of any cable failure, more than 32 automatic detectors or 10 manual call points are not disabled, the devices are in the same area, if the fault is resolved, all disabled devices start working". The necessary hardware and software should be provided for this.
- 12.8. During the installation of smoke detectors, care shall be taken to keep them away from blowing grilles at least 100 cm and 30 cm from suction grilles.
- 12.9. Smoke detectors shall be placed considering both the height and the ventilation conditions of the place. The protection areas of smoke detectors should be adjusted according to the ventilation conditions of the environment. (For example: 10% protection area of the ventilation should be reduced in a room with 10 cycles / hour.)
- 12.10. In the case that the detector type determined during the design phase is detected in terms of EN54 or past experiences of the Contractor, both faulty alarms and not being able to receive an alarm, the Contractor shall propose changing the detector type. The type of detector shall be finalized with the opinion and approval of the Employer.
- 12.11. Heat detectors shall be both temperature and heat increase detectors, except in special cases.
- 12.12. In places where heat detectors are placed, protection area correction coefficient shall be applied, taking into account the mounting height, and protection area shall be reduced in high areas.
- 12.13. Audible alarms shall be at least 15 dBA above the highest ambient background noise (80 dBA) that is likely to last for more than 30 seconds, provided that it does not exceed 118 dBA. These lowest levels shall be reached where the alarm should be heard. The sound type of the audible alarm devices shall be adjustable and shall be selected by the Employer differently from other alarm signals used in the establishment. Audio Alarm Device used indoors and outdoors must have the same sound type. Audio and visual alarm devices to be placed outside the building shall be in the approach direction of the fire brigade to the building.
- 12.14. Visual alarm devices shall be of flashing light type.
- 12.15. In cases where higher requirements than the specified IP protection class are required, these devices shall be selected in IP 65 or equivalent protection class in accordance with the outdoor field conditions in the places where the devices to be placed in accordance with indoor use for Audio Alarm Devices and Manual Call Points shall be used.
- 12.16. Fire Detection and Alarm Panel power output shall be used for the power supply of the desired number and distribution of Audio Visual Alarm Devices. However, if the required output power cannot be provided by the Fire Detection and Alarm Panel, additional power units shall be used, since the provision of the required output power is counted in the Fire Detection Alarm Panel feature and the power unit in the specified quantities. If this is the case, it should be indicated in the offer and submitted for approval as a "Field Type Traceable Uninterruptible Power Unit". In order to obtain the required sound-light intensity, if it is necessary to use "Field Type Traceable Uninterruptible Power Units", it shall be evaluated in the Fire Detection and Alarm Panel.
- 12.17. Cables shall be connected to all devices by ring, cable lug and labeling. Rings shall be tightened with special crimping pliers.
- 12.18. Cables shall be resistant to heavy operating conditions, fire resistant, with reputable approvals. Cable types are given as indications and the Contractor shall indicate the cable type suitable for his system in his proposal. There is no obligation in the cable brand and model, and it shall be expected to comply with the general system rules and regulations.
- 12.19. Cable cross-sections, unless otherwise specified, connections of bulk or multi-core cables such as all audible-light alarm devices, power supplies, power relay outputs shall be at least 1.5mm<sup>2</sup> cross-section. Single or multi-core cables such as detector and alarm button wiring, connections between input modules and monitoring switches, connections between control modules and other devices or repeater panel connections shall be at least 1mm<sup>2</sup> in cross section.
- 12.20. Cable cross-section and given features shall be compared with the features of its own system by the Contractor. Any kind of auxiliary materials not mentioned here, additional wiring or different cross-sections required for the operation of the system must be supplied under the responsibility of the Contractor. All materials to be supplied must be submitted for approval before use.



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- 12.21. The cable between the two elements shall be in one piece and without joints. If a single piece of cable is longer than 100m, splices may not be more frequent than 75m. In case of additions, the joints shall be made by placing a surface-mounted junction box and using the row terminal in the box. All kinds of junction boxes shall be numbered, marked and labeled in the field and projects. In case of using shielded cable, the continuity of the cable shield shall be ensured in the connection. The cable installation piping shall be grounded and its electrical continuity shall be ensured.
- 12.22. Cabling is used in outdoor environments, installation volumes and storage areas in branches to be taken from the main line in EMT conduit (Electrical Metal Tubing); In areas such as main lines leading from the ceiling in production areas, suspended ceilings in work offices, suspended ceilings in administrative buildings, changing rooms, through the fully closed pan; shall be passed. Between the Building and the Panel, the routes determined for weak current can be used without additional protection within the existing gallery. Transitions between buildings can be made with cable trays. Existing pans, channels or galleries can be used with the approval of the employer. Cable routes of fire detection installation shall not be the same as high and medium voltage installations.
- 12.23. The cable and installation of the existing system that meets the specified conditions in terms of material and compliance can be used on the field cable route of the system to be installed, with the approval of the Employer, by carrying out all tests and controls.
- 12.24. The electrical feeds required for the systems shall be taken from the points indicated by the employer authorities, and device feeds shall be provided without passing through any additional breakers. The electrical installation taken from the closest point to the source by passing through the least breaker shall be delivered to the panel using 1 10A, late-pulse W automat. In places where the installation is together with other electrical installations, cables, breakers shall be labeled showing the intended use.
- 12.25. All electrical installations shall be labeled as dead end at device inputs, junction boxes and panel connections, and their connection diagrams shall be provided. In addition, cables longer than 20m shall be labeled every 10m. Connection diagrams shall be available in the relevant connection area. There shall be no cables, harnesses or connections that are not labeled.
- 12.26. In case the technical specifications of the devices to be used are not suitable for the environmental conditions of the places to be installed, the Contractor is obliged to take appropriate protection measures or propose different types of devices and ensure the healthy operation of the system.

### 13. Material Supply

- 13.1. All new materials to be supplied shall be new, unused, produced with first class workmanship, in accordance with the technical specifications specified in the Technical Specification, and shall provide the desired performance
- 13.2. All kinds of materials specific to the fire system to be used in the system must have the specified quality approvals. It is preferred that the materials are EN, DIN or VDS approved. General installation materials that are not specific to fire must have a respectable foreign approval or at least IBC certificate.
- 13.3. All materials to be used shall be submitted to the approval of the Employer. Specifying any brand or model during the offer does not mean that it can be used even if it does not comply with the Technical Specification. In addition, since the installation of the materials shall be carried out under the responsibility of the Contractor, it shall be essential to purchase the material installed and in working condition, a device that does not fulfill its function, even if it is installed, shall not be accepted.
- 13.4. The contractor shall provide an aggregate Bill of Materials for all materials to be used before starting work. After the Bill of Materials, all materials shall be submitted for approval along with the Manufacturing Drawing, in order of priority in accordance with the order and installation (assembly) program. Material ordering and application can only begin after the materials submitted for approval are fully approved and the assembly and application details are finalized. The employer shall respond to material approval applications by evaluating them in the Approval / Conditional Approval / Rejection form within a maximum of one week. The employer may request more detailed information about the materials submitted for approval at the approval stage, see a sample of the material and request that they be tested. Materials not included in the material list but used in assembly are included in the approval content.
- 13.5. The employer has the right to refuse to apply any material that it determines does not comply with the technical demands and the performance it should provide, at any stage and instantly, regardless of whether it was previously found appropriate.
- 13.6. Unless otherwise explicitly stated, all materials individually and as a whole system shall be under the warranty of the Contractor and the material producer and supplier companies against manufacturing and assembly faults for 2 years after they are received in working condition. In all guarantee transactions, the Employer shall accept the Contractor as the addressee. Other terms of warranty are explained separately.
- 13.7. Even if it is not specified in the specification, all kinds of materials to be used outside the building (electrical, mechanical, construction, etc.) are protected against external weather conditions (protected against temperature difference, low temperature, humidity, precipitation, dust, etc.) , unless specified separately, it shall be supplied and installed as at least IP 55).
- 13.8. Field elements such as detector, manual call point and horn strobe shall be easy to clean and maintain. Maintenance shall be done easily in the field, and if special devices are used during cleaning and maintenance, 1 set of these devices shall be delivered to the Employer's officials at the end of the 2-year maintenance and warranty commitment.



- 13.9. All of the field staff shall be labeled, marked and associated with the manufactured state projects. If deemed necessary according to the shape of the horn or flashing light, the "Fire Alarm" label may be requested.
- 13.10. Manual Call Points shall be explained in English and Georgian. If deemed necessary, the label "Manual Call Point" may be requested.
- 13.11. It is the responsibility of the Contractor to have spare parts for consumables and system failures that may occur during commissioning.
- 13.12. Plastic materials such as cables, conduit, cable ducts other than the devices to be used in the assembly shall be made of materials that do not emit toxic gases and do not transmit flame when burned.
- 13.13. The Contractor shall be obliged to determine the explosion-proof device, equipment, installation and materials in accordance with the map zones in the current and to be installed system layout, with the current explosive environment zoning map to be provided by the Employer, as of the starting date of the installation works, in accordance with the conditions required by the production in the field. Relevant changes shall be submitted for Employer's approval. Application can be made after the approval of the employer.
- 13.14. As a separate item, the supply of auxiliary and consumable materials that are not in quantities but used to fulfill the technical specification requirements are included in the scope of work. It is the Contractor's obligation to supply all kinds of consumables to be used in trial and acceptance procedures during temporary acceptance.
- 13.15. The Contractor should check whether the materials to be offered are suitable for use on site according to the material list during the site visit. When deemed necessary, it should present the options that are most suitable for the proposed material and that shall positively affect the system performance with alternative offers.

#### **14. Installation (Assembly)**

- 14.1. Installation (assembly) of the devices is an integral part of the work and shall be carried out by the Contractor.
- 14.2. In device connections, cables shall be connected to the device terminals by attaching cable lugs and tightening with screws.
- 14.3. The Contractor can also do the installation work or have it done by another Sub-Contractor company. However, if the Subcontractor is to be used, the Contractor shall clearly indicate what shall be the work to be done by the Sub-Contractor during the bidding phase. The Contractor shall add the letter of undertaking from the Sub-Contractor (stating that the Sub-Contractor agrees to work with him in case the Contractor receives the job) to his proposal.
- 14.4. The Contractor shall specify with which Subcontractor it shall perform the installation during bidding and shall not change the Subcontractor specified without the request and approval of the Employer; shall do the work with the Subcontractor that it has notified. The Contractor may declare more than one Sub-Contractor at the bidding stage. In all cases, the Contractor is responsible for the works to be done by the Subcontractor. If the Employer deems it necessary, he may request the Subcontractor to be changed.
- 14.5. All installations and materials shall be applied by knowledgeable, trained and experienced people with first class workmanship in accordance with the manufacturer's knowledge and technique.
- 14.6. The works to be carried out in the field shall only be assembly, installation (assembly), cable pulling, connection and finishing works, steel construction manufacturing, cutting, welding, sandblasting, painting, etc. The work shall be done entirely in the workshop (workshop), using standard production techniques and machines.
- 14.7. The electrical installation shall be checked against leaks and grounding faults. All electrical installations shall be checked before the devices are connected, and any malfunctions due to incorrect connection shall be prevented.
- 14.8. The electrical wiring shall be made from existing cable trays of suitable size according to the number of cores and cables in the installation volumes or outdoor environments, and in case there is no or not sufficient trays, the plastic cable channel with cover shall be made.
- 14.9. Holes, breaking, etc. that may occur during assembly and disassembly. It shall be repaired afterwards, painted and returned to its original state.
- 14.10. In the cable entries of the devices, intermediate parts suitable for connection and wiring technique shall be used.
- 14.11. During the application, in the placement of the beam detectors; Due to ceiling irregularities, architectural requirements, suitability for work or device maintenance in the factory, it shall be possible to shift within the limits defined in the drawings (at most, the difference between the detection distance allowed by the standards and the distances determined in the design). If the relevant relocation is required, the changes to be made before the procedure shall be submitted to the approval of the Employer and can be implemented after the approval.
- 14.12. In order to prevent access and improper placement problems that may occur due to applications, changes and updates in the installations of Manual Call Points and Audio Alarm Devices, Employer's approval must be obtained for the mounting locations.
- 14.13. Cable and installation materials are estimated to be given by all bidding companies to give equivalent cable and material quantities, may change 25%.

#### **15. Trial (Test) Procedures**

- 15.1. After the systems are installed, they shall be tested before they are put into operation. The trials described under this title are not a part of the temporary admission process, and the temporary admission procedures can only be started after these trials are deemed sufficient by the Employer. In this context, re-execution of all or part of the specified trials can also be required for temporary admission procedures. It shall be ensured that specialist institutions or organizations participate in the trials. Third party expert supervisors shall present their opinions in written reports to the Employer at the stages of installation supervision, trial, commissioning and acceptance. All equipment and consumables required during trial and commissioning shall be provided by the Contractor.
- 15.2. The Contractor shall apply to the Employer in writing to perform the trials under the supervision of the Employer of the systems that are brought into working condition without error. The Contractor shall also submit a "Trial Report" as an attachment to this application. In this report,
1. Description of the trial to be performed,
  2. The purpose of the trial,
  3. Events or measurement values whose performance is to be observed,
  4. Methods and devices to be used for measurement,
- shall explain clearly and in detail. Trials in which the Employer shall participate as an observer shall be performed after this report is approved.
- 15.3. As stated above, the re-execution of all or part of the trials mentioned can also be requested during temporary admission procedures.
- 15.4. All kinds of commissioning materials, labor, test and measurement devices, engineering services, etc. required for the delivery of the systems in working condition shall be provided by the Contractor.
- 15.5. After the successful completion of the Trial Procedures, the system shall be delivered in working condition in accordance with the Commissioning procedure.
- 15.6. Commissioning shall be performed in accordance with a form and procedure to be approved by the Contractor to the Designer-Consultant and the Employer.
- 15.7. All kinds of commissioning materials, labor, trial and measurement equipment, engineering services, etc. required for the delivery of the manufactured section in working condition shall be provided by the Contractor.

## **16. Commissioning Process**

- 16.1. Systems with completed trial procedures shall be deemed ready for commissioning.
- 16.2. After the successful trials, the system shall be delivered in working condition in accordance with the Commissioning Procedure.
- 16.3. Commissioning is not a part of the temporary admission process, but an integral part of the direct commitment work.
- 16.4. The commissioning work shall be performed in accordance with a form and procedure to be approved by the Contractor to the Designer-Consultant and the Employer.
- 16.5. The Contractor shall prepare the transactions, observations, values and comments performed during commissioning as "Commissioning Report" and submit it to the Designer-Consultant and Employer.
- 16.6. All kinds of commissioning materials, labor, trial etc. required for the delivery of all fire protection systems in working condition shall be provided by the Contractor.

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