**ANNEX 1: SCHEDULE OF REQUIREMENTS**

**1. Introduction and objectives**

Climate related disasters take place more and more frequently and repeatedly in Moldova, causing economic damage of approximately USD 4 million annually. Such risk exposure is explained by the dependence of the agriculture on the amount of precipitations at a country level, this being the most vulnerable sector of the national economy. The main reason is the deficit of water for agricultural needs, as well as the limited resources and capacities to plan and use the irrigation water storage infrastructure in the rural communities of Moldova.

In this context, the „Climate Change and Disaster Risk Reduction” project aims at strengthening the capacity of rural communities to adapt to climate change and disaster by improving the water storage infrastructure and the climate related disaster risk reduction measures, and the main goal of the project is to facilitate the implementation of intelligent solutions for water management in agriculture, flood management, fire prevention and extension of the community teams of rescuers/firefighters in the rural area of Moldova. The project implementation period is 2019-2021, and the geographical areas of activity and intervention are limited to 5 districts - Cantemir, Criuleni, Hîncesti, Leova and Ungheni. The project is financed by the Austrian Development Agency and implemented by the United Nations Development Program.

One of the project activities envisages the construction of 5 rescue/fire stations in the rural communities: Pirlița, Sărăteni, Baimaclia, Drăsliceni, and Sărata-Galbenă, which shall be an integral part of the national network of rescue/fire stations. Those 5 rescue/fire stations shall be built and provided with the necessary equipment by mutual agreement and with co-financing from the Local Public Authorities (LPAs). They shall have a coverage area from 6 to 17 neighboring communities, thus rendering rescue and/or firefighting services for appr. 58,714 people, appr. 50 % of which shall be women.

**2. Content of works and beneficiaries**

2.1 These Terms of Reference provide for the construction of two fire stations on plots of land – property of the village administrations of Pirlita village, Ungheni district, cadastral no. 9261000864.p and Baimaclia village, Cantemir district, cadastral no. 2112114084. Each station represents a new construction of metallic frame, enveloped with modern, precast, easy to assemble and ecologically pure materials. The building with the dimensions of 12.0x12.0m, shall have a total height of 6.0m and shall host a fire truck in the compartment of 6.2x12.0m, which has the heigh against the light of H=4.5m. The terms of reference include the following types of works: earthworks; foundation of monolithic concrete; metal frame mounting; enveloping the building and mounting the “sandwich” panel roof; construction of partition walls of plasterboard panels; installation of carpentry items (windows and doors); flooring construction; construction and putting into operation of internal and external engineering networks; works on territorial organization and planning, and access ways to the building. All these types of works shall fully ensure the standard conditions of activity of the voluntary rescuers/firefighters’ teams of Pirlita village, Ungheni district and Baimaclia village, Cantemir district.

2.2 The construction works for which this invitation to bid is launched refer to the following lots, as follows in the table below:

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| **Lot** | **Community** | **Name of the Project proposal**  |
| **Lot 1** | Pirlita village, Ungheni district | “Construction of the community rescue/fire station” |
| **Lot 2** | Baimaclia village, Cantemir district | “Construction of the community rescue/fire station” |

2.3 Particularly, during the projects in Pirlita and Baimaclia villages, the following construction and assembly works shall be performed:

* Site preparation works, including site fencing, site WC, etc.;
* Land leveling and earth digging for foundation;
* Construction of the foundation in form of monolithic concrete strips, building of 12x12 (m);
* Metal frame mounting works;
* Mounting the roof of sandwich panels for roofing;
* Enveloping the building with sandwich panels for walls;
* Construction of ceramic tiles flooring;
* Construction of industrial concrete flooring;
* Construction of partition walls of plasterboard panels;
* Mounting the carpentry items (doors and windows);
* Interior finishing works;
* Mounting and putting into operation the internal engineering networks: electricity, automation engineering, surveillance, fire alarm, security, telephone, internet, heating, ventilation/conditioning, water supply and sewage;
* Construction of external engineering systems: electricity, water supply and sewage;
* Organization and improvement of the land and access ways to the building;

2.4 The Contractor should ensure everything necessary for the successful fulfilment of the contract: works, engineering, materials, equipment, auxiliary materials, transport, machines, tools, and necessary travelling to perform all the works provided in this contract.

*Usually, the proposed Contract provides the following activities:*

* ***purchase and supply*** of materials and equipment;
* ***preparation of the construction site*** both for the storage of materials and equipment and for the safe performance of works;
* ***performance of the construction and assembly works –*** mentioned in the Terms of Reference;
* ***putting into operation and placing in service*** of the object and engineering systems completed according to the local legislation;

2.5 The contractor should also make sure that all the materials, goods and equipment, before being purchased and used in the interests of the contract, are coordinated with the representatives of the Beneficiary and of the CCDRR Project/UNDP Moldova, empowered accordingly: for the daily supervision and for periodical monitoring of the works at the object.

***Note for bidders:***

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| ***Anytime when the technical specifications require a particular product, specific brand, name/model, the bidders may propose for coordination any other products equal in all the aspects to the specified products and fulfilling the requirements of origin, all the physical, functional and performance parameters.*** |

**3. Construction site**

The works notified in this bid shall be performed according to the above-mentioned lots of the objects.

**4. Organizational arrangements**

The project implementation and performance of the works on site shall be monitored by the Consultant – Engineer appointed by UNDP Moldova, who shall make systematic monitoring visits to the construction site. Additionally, the Technically Responsible Engineer authorized by the Project Beneficiary shall ensure the daily supervision of the construction activities provided in the contract.

1. **Expected results**

The Contractor is expected to deliver the following *results*:

***Result 1****:* Completion of all the construction works land improvement, etc. provided in the contract documents, within a period of not more than ***150 calendar days*** from the date of signing the Contract***.***

***Result 2:*** Final placement in service of the object within a period of: ***up to 3 months*** from the date of acceptance of the object at the completion of works.

1. **Main Requirements and Technical Specifications**

6.1. *Technical design:* The construction works included in the terms of reference issued for this tender shall be performed in accordance with the Technical Designs No. 04/2020.1.1.1, and No. 04/2020.4.1.1, developed by SRL „Bim Tech Solution”, License Series A MMII, no. 045303 of 31.07.2014, on the basis of the Urbanism Certificates: No.1 of 06.03.2020 - for Pirlita and No. 36 of 14.07.2020 - for Baimaclia. The Technical Requirements comprised in the terms of reference are extracted from the technical prescriptions of the technical design.

***Constructive solutions and architecture***

*Attention!* It is important to mention that the Terms of Reference envisage the construction of two identical buildings – stations for voluntary firefighters/rescuers, with equal volumes and technical parameters, and with constructive solutions and architecture of the same type. Only the technical parameters and volumes of the external engineering networks and territorial planning will vary.

6.2. *Organization and documentation of the construction works*:

*Preparation of the construction site.* Any work for the preparation of the construction site shall be initiated only after the Contractor obtains the *Permit for construction and site transmission*. Before starting the construction works, (i) the authorized plot of land for construction shall be fenced with a temporary fence, which shall be dismantled only after all the construction and assembly works provided in the contract are finished; (ii) all the networks / existing communications that intersect the foundation pit or are located in its immediate vicinity shall be also displaced. (iii) In the case of Pirlita, as the foundation is placed on compactable ground, a (clay-sand) soil cushion shall be made, with the thickness h=1000mm, which will serve as a foundation land and will have the following characteristics*: p=2.00g/cm2, φ=2.5°, C=24.0 kPa, E=20 Mpa, e=0.750.* The construction works shall be performed in accordance with the section of the technical design “Organization of Construction Works” – OCW and with the provisions of the normative documents NCM A.08.02:2014 "Labor health and safety in constructions"; NRS 35-03-96-2008 "Industrial safety requirements in the construction, mounting, putting into operation, use, repair and technical verification of cranes". During the verification, acceptance of the construction works and related installations the norms in force shall be observed in order to ensure the application of the system of quality in constructions instituted by means of Law no. 721 of 02.02.1996 on the quality in constructions, and by means of other related normative acts.

 *Attention!* All the performed works shall be recorded daily in the *Technical File* of the object. The works that become hidden shall be accepted using minutes of verification in accordance with the provisions ofCP A.08.01-96. The minutes shall be a part of the technical file of the object/construction.

The purpose of the *Technical File* is to documentary reflect the course of performance of the construction. It gives the possibility to follow and to know the quality of construction works, the main characteristics and parameters of the object, as well as their evolution after its placing in service and, directly, during its operation. The technical file of the construction (TFC) comprises all the technical documentation on the performance of the construction, starting with the design stage and up to the placing of the object and engineering systems in service, and mirrors at the same time the subsequent operation of the object, including all the modifications that may be made in the process of its operation.

6.3. *Foundation of the building*: The foundation of the building, with the depth of 1.6 m, of a continuous form, shall be built of monolithic reinforced concrete, of C.15 mark; the leveling layer with the thickness δ=100 mm shall be of monolithic concrete, of C.7.5 mark. The foundation shall be hydro-insulated with bituminous materials. *Attention!* No penetration of atmospheric water in the foundation pit shall be allowed for the Pirlita station. For this purpose, a knoll of earth with the height of 500 - 600 mm shall be made on the entire perimeter of the foundation pit. During the performance of digging works in wintertime, the freezing of soil under the foundation shall not be allowed. The soil used to fill the pit of sandy clay shall be compacted in layers until it reaches the value of λ=1.65kg/cm2. After compaction, a protection drywall shall be made to ensure that surface water does not penetrate to the footing of the foundation, which drywall shall be made on the entire perimeter of the construction. The foundations shall be reinforced with AIII and AI rebars, of various diameters, GOST 5781-82. Anchors of the M20 type with the length of l=900mm shall be used to fix the building frame to the foundation.

6.4. *Constructive scheme*: Metal frame, of load-bearing elements made of 200x200 mm, 200x100mm, 100x100mm “**□**” profile, gr. δ=4.0÷6.0mm, of steel C235, GOST 30245-2003, other conjunction metal elements GOST 19903-74. The metal constructions have been designed in accordance with the requirements of SNiP-2.01.07-85 “Loads and effects” and SNiP II-23-81\* “Steel constructions”. The welding of metal elements shall be done in strict conformity with the requirements of GOST 5264-80\* “Manual arc welding. Welded junctions”. The welding of metal elements shall be done with Э-42А electrodes, GOST 9467-75\*. The height of the weld seam shall be equal to the lowest thickness of the elements joined by welding. The protection of metal constructions shall be performed according to the requirements of SniP-3.04.03-85\* “Protection of construction structures and frames from corrosion”. All metal constructions shall be painted, in a paint room, with a layer of ГФ-021 primer, GOST 25129-82 and two layers of ПФ-115 enamel paint, GOST 6465-76, before being transported to the construction site. The mounting of metal constructions shall be performed in accordance with the requirements of SNiP -3.03.01-87\* “Load-bearing and fencing constructions”.

6.5. *Roof:* The roof shall consist of two slopes of roofing “sandwich” panels, mounted on bracing and beams of type U metal profile, with the inclination i=20°. The panels shall be of two dimensions: 6.1x1.0 (m) and 6.4x1.0 (m), with the thickness d=120mm and insulation of mineral wool with FIRE safe certification, density ρ=40kg/m3. In both cases the galvanized external tin shall have the thickness δ=0.5mm, and shall be painted in electrostatic field with 60μm polyester paint, RAL 9006. The inferior tin shall also be galvanized, with the thickness δ=0.5mm, painted in electrostatic field with 60μm polyester paint, RAL 9006. For the collection and removal of rainwater from the building foundation, the roof shall be provided with a system of drainpipes and gutters made of cold profiled tin with the thickness δ≥0.5mm and dimensions, accordingly: drainpipes - Ø=100mm and gutters - Ø=120mm. The lower level of the drainpipes shall not be higher than 200mm from the drywall level.

6.6. *Envelope of the building*: The enveloping of the building shall be done with insulated wall sandwich panels, of various dimensions, with the thickness d=100mm, mounted on the metal frame of the building. The galvanized external and inferior tin shall have the thickness δ=0.5mm, pained in electrostatic field with 60μm polyester paint, RAL 9006.

*Attention!* *The dimensions of the wall panels and apertures for windows and doors shall be specified on the construction site*.

All the closure elements, roof valleys, gutters and drainpipes shall be ordered of cold profiled tin with the thickness δ=0,5mm, of the RAL 7016 (anthracite) color. All the closure elements shall be fixed with self-tapping screws. The fixing elements shall be specified by the general contractor on the basis of the requirements of the sandwich panel manufacturer.

The door aperture bordering profile shall be fixed to the sandwich panels with pop rivets. Polyurethane foam shall be used as insulation applied on the construction site.

*Attention! The optimization, replacement or change of the profiles of the tin closure elements shall be coordinated with the design author.*

The red decorative strips on the façade shall be made of aluminum composite material RAL 3002 or 3003. The door and window casing on the outside shall be made after all the carpentry items are mounted, taking into consideration the thermal bridge breaking technology.

*6.7. Plinth wall of the building:* The plinth wall of the building shall have thermal insulation up to 1.0 m in depth, with an extruded polystyrene layer λ=0.035 W/mK, thickness δ=80mm, and shall be covered with GREY color clinker on the visible portion. The extruded polystyrene plates (XPS plates) shall have a resistance to compression of 10 %, linear deformation not less than 300 kPa; C3 fire safety class; steam permeability coefficient shall be 0.01 mg (m-hour-Pa); minimal density ≥ 28 kg/m3; thickness tolerance T5, according to EN 13162; closed porosity is allowed; threshold temperatures of use from -50°C to +70°C; long term water absorption by total immersion: ≤ 0,7%; Fixing with adhesive mortar and additionally with the use of dowels in accordance with the technical requirements, SA section.

6.8. *Partition walls:* The partition walls shall have the thickness d=120mm, shall be insulated on the inside with mineral wool, δ=60mm, with FIRE safe certification, density ρ=40kg/m3. Humidity resistant plasterboard sheets shall be mounted on both sides, fixed on the load-bearing metal frame of U type galvanized profile (d=64mm), in two sheets. The inferior plasterboard sheet shall have the thickness δ=12mm, the exterior sheet – thickness of δ=10mm. The plaster layer under the paint shall be of 6.0mm. the partition walls shall be fixed with self-tapping screws to the floor and to the metal frame of the roof. At the level of junction with the ceiling, a decorative plinth shall be mounted on the walls.

6.9*. Floorings*: The fire station shall have two types of flooring: ceramic tiles (in the auxiliary premises) and polished industrial concrete of the „SuperConcrete” type from KLINDEX (in the firetruck compartment).

*Ceramic tile flooring,* the ceramic tiles shall have the dimensions not less than 300x300 mm, thickness of δ=15 mm, they shall be of light color, placed on a layer of glue of the Supraten class, with the thickness δ=10 mm; the leveling layer with the thickness δ=40mm, of cement-sand mortar, M150 mark, shall allow to make the incline towards the siphon pipes i=1.5-2%, placed on the separator layer, δ=2mm, of technical polyethylene foil; the thermal insulation of the floorings shall be ensured with one layer, δ=50mm, of extruded polystyrene (XPS plates), λ=0.038, p-40kg/m3; placed on a bed of reinforced concrete of B12.5 mark, AI Ø 6 mm rebars, 200x2000 pace, with the thickness δ=100 mm, and a bed of gravel of the M300 mark, 20-40 fraction, compacted in ground, with the thickness δ=100mm.

*Attention!*

*1. The flooring mounting works shall start after the mounting, acceptance and documentation of the engineering networks.*

*2.The hydro-insulation of the flooring in the wet regime premises shall be done with a layer of technical polyethylene foil, mentioned above, with overlapping and bending on the areas of the walls h=150mm*.

*Industrial concrete floorings*, with hardener, with the thickness δ=5mm, applied by means of plastering; placed on a blanket/screed of monolithic reinforced concrete of B20 mark, reinforced with two AIII Ø 8mm rebar meshes with the thickness δ=150mm, pace 200x200; on the separator layer, δ=2mm, of technical polyethylene foil; the thermal insulation of the flooring shall be ensured with one layer, δ=50mm, of extruded polystyrene (XPS plates), λ=0.038, p-40kg/m3; placed on a bed of B12.5 concrete, with the thickness δ=100 mm and a bed of gravel of M300 mark, fraction 20-40, with the thickness of δ=100mm.

6.10. *Carpentry items:*

*Windows*, double-glazed, with PVC profile frame, the metal case core with the thickness δ ≥1.5mm, frames with not less than 5 chambers. The PVC profile shall be white. The thickness of the double-glazed profile: - for windows δ ≥60.0mm, thickness of the external walls of the profile δ ≥3.0mm, double glazed glass units with the thickness δ ≥ 24.0mm, in 2 window glasses, glass δ =4.0mm; profile warranty – not less than 30 years; double glazed glass unit warranty – not less than 10 years; the ironwork should resist up to 20000 openings (or 30 years) and stand a weight up to 135kg; heat transmission resistance R° ≥0.4m°C/Bt, noise resistance ≥40dB; U value<1.3w/m2K; should be equipped with micro-ventilation (Vents); All the interior window units shall be complemented with plastic sills (PVC jambs) with the dimensions depending on the location and thickness δ=20 mm; with lateral protective PVC caps of the same system as the jamb; high UV resistance; resistance to intensive use; resistance to humidity; not flexed and not distorted under the influence of mechanical and/or thermal factors; warranty – minimum 10 years; on the outside the windows shall be complemented with sills (jambs) of zinc-coated tin with the thickness δ=0.7mm, varnished with RAL 7016 (anthracite) polymeric paint.

*Doors* – the interior doors framed in the partition walls should be of the same material (PVC); the doors that come into contact with the external environment should have the total value of the thermal conductivity coefficient per item less or equal to 1.7 [W/m2\*K].

All the outside carpentry items of the building (doors and windows) shall be made of the same system of profiles, with the same color and thermal-physical properties; All the sizes of door or window frames stated in the design should be specified on site by the contractor before ordering them.

The closure elements for the frames (*windows and doors*) are mentioned in the AS – architectural solutions album and should comply with GOST 31173-2003.

6.11. *Finishing:* Type of finishing for walls and ceiling – plasterboard in all auxiliary rooms, this shall include deep penetration primer, smoothing with dry mix on fiber-glass mesh with the mass P=80gr/m2, mesh dimensions: 6.0 mm; roll width: 1.0 – 1.1m; roll length: 50 - 100m; composition: glass fibers impregnated with styrene-butadiene without PVC; with tensile strength after 28 days in normal conditions ˃1750 N/50mm; tensile strength after 28 days in chemical conditions ˃1000 N/50mm; durability of 30 years, losing the tensile strength up to 50%; resistance to alkaline substances, the window and door frames shall be additionally reinforced in the corners with a 20x40 cm wide strip, according to CP E.04.02-2013; width of the dry mix layer with mesh - δ=3.0mm; puttying with plaster for inner works with the thickness δ=1.0mm; high quality plaster for inner works δ=0.5mm, primer; painting with RAL 9010 high-resistance acryl-polymeric emulsion (2 layers).

6.12. *Coloristic specification file:* The coloristic specification file of the fire station facades should be observed – according to the technical designs No. 04/2020.1.1.1, and No. 04/2020.4.1.1, section – CSF.

***Internal engineering networks***

6.13. *Heating and ventilation:*

The design of the heating and ventilation systems has been developed in accordance with the normative requirements: NCM E.04.01:2017 – «Thermal protection of buildings»; SNiP 2.04.05-91 – «Heating, ventilation and air conditioning»; NCM C.01.04-2005 – «Administrative buildings»; NCM E.03.02-2014 – «Fire protection of buildings and installations».

The external walls and roof and of designed building contain high-efficiency thermal insulation material. The thermal resistance of the external walls is equal to – 3.14M2x°C/wt; and the roof has a thermal resistance of – 3.18M2x°C/wt. The heating and ventilation systems are calculated for a total loss of heat of the building equal to 14.0kWt; the total capacity of the electrical equipment is N=15 kWt. 220 V electrical power shall serve as power source for heating and ventilation.

*Heating:* the service and utilities premises shall be heated with electrical convectors of the BALLU type: three with the capacity N=2.0kWt, 220v, - BEC/EZMR-2000 and one with the capacity N=1.0kWt, 220v, - BEC/EZMR-1000. The electrical convectors shall be mounted on the walls. Their weight is of 5.6kg and 3.1kg, accordingly. The firetruck compartment shall be heated with infrared heaters of the BALLU type, two with the capacity N=3kWt. ~220v, with the dimensions 1.36m Х 0,25m, and one with the capacity N=1kWt ~220v, with the dimensions 1.36m Х 0.13m. The infrared convectors shall be fixed to the constructions of the roof/ceiling. Their weight shall be of 7.8kg and 3.4kg, accordingly. The maintaining of the heating parameters of the premises shall be done with an automatic sensor.

*Ventilation:* The mixed ventilation system – incoming and outgoing, shall be with both mechanical and natural impulse. In the service and utilities premises the ventilation will be with natural impulse, and mechanical impulse ventilation shall be installed from the electric stove in the kitchen. The firetruck compartment shall be provided with both forced ventilation system with a zinc-coated metal pipe, δ=0.5mm, diam. Ø=315mm, and with a system to remove the smoke from the exhaust pipe, diam. Ø=100mm. The ventilation system shall be provided with the following equipment: a pipe ventilator of mixed type, for the round pipe, with the diameter Ø=315mm, G=1500М3/hour, Н=200Pa, electrical engine N=0,32 kWt, n=2433 rot/min. ~220v, of the “Systemair” type; smoke removal system DP-100-6, in set with: zinc-coated metal pipe, δ=0.5mm, hosepipe, chimney damper, remote control, capacity of 370m3/hour, of the «Сов.Плим» type, Saint-Petersburg. Metal ventilation grills with installation on the outside shall be used in the ventilation system, accordingly: 2 pcs.- 400x400mm, 2 pcs. - 400x200mm, 2 pcs.- Ø=400mm.

6.14. *Water supply and sewerage*.

The design provides for the supply of cold drinking water, hot water and household sewage. The cold drinking water and hot water supply networks shall be made of polyethylene pipes – PE, SDR 17, PN 10, diameter: Ø=25,20,15 mm. The internal household sewage networks shall be of PVC pipes with the diameter Ø 100÷63 mm. The incline of the sewage networks with free wastewater drain shall be equal to i=0.02÷0.03. In the chimney for connection to the existing public cold water supply networks, (connection shall be done according to the technical conditions), a water-meter node with the diameter Ø 15 mm, „C” class, shall be installed, in set with spherical bronze faucets, liquid filter, reversive valve. The supply of hot water shall be one from the electric boiler of the fire station, V=50L, N=1.8kwt. All the diameters stated for the pipes of the cold and hot water networks correspond to the inner diameter of the pipe. In the places of intersection with the walls, the pipes shall be mounted in protective tubes with the diameter Ø 63 mm. All the cold and hot water networks (main pipelines, columns and pipes located in protective tubes) shall be insulated with thermal insulation hose of the „ПЭП” type. The water consumption norms, flowrate of cold and hot water, sewage and wastewater are calculated according to SNiP 2.04.01-85. The installation and acceptance of the plumbing equipment shall be done according to CH 478-80.

6.15. *Power electrical equipment and inner lighting*:

The power electrical equipment and inner lighting has been developed in accordance with the local normative requirements: NCM G.01.02:2015 - "Design and mounting of electrical installation in residential and social buildings"; NCM C.04.02-2017 - "Functional requirements. Electrical installation. Natural and artificial lighting" and "Power equipment installation rules".

The technical design provides for operational electrical lighting distributed in several groups and a separate service group for rooms 1 (communication point), 2 (break room), 8 (firetruck compartment), connected to the main distribution cabinet. The inner networks shall be made of cable - ВВГнг-LS, of 5 and 3 wires (as the case may be), including the earthing wire, mounted in PVC tubes with Ø 14-32mm, fixed on the walls and ceiling constructions. The sockets shall me mounted at the height of 0.3 m from the floor. Switches shall be installed at the height of 1.0 m from the floor. The design also provides for the installation of the III category thunder protection system, with full, uninterrupted electric circuit. At the depth of 0.5 m from the ground level, the vertical electrodes with Ø 20mm shall be connected by welding to the metal pieces of the building frame (columns) with a metal strip of 25x4mm.

*Main specifications and technical parameters* of the electrical equipment units and materials: electrical counter at the entrance, in set – of the BZUM-TF type; automatic switches – of the ВА47-29/3/С32А, ВА47-29/1/B10, ВА47-29/1/С4-25 type,cable, copper electric conductor - 3x1.5mm2 and 3x2.5 mm2 - of the ВВГнг-FRLS type; luminaires 35W, IP 20 - OPL/S ECO - LED; 18W, IP 54 – CD LED; 70W, IP 54 – ALS.PRS UNI LED; 70W, IP65 – NBU 70;

6.16. *Automatic fire alarm system:*

The automatic fire alarm system has been developed in accordance with the requirements of the local normative documents: РД 78,145-93; NCM E. 03.03-2018; NCM E. 03.05-2004; NCM G.02.01:2017 and "Power equipment installation rules".

For the organization of the fire alarm system, the MAG 4P receipt and control device is used, as well as sensors connected in ribbon: smoke sensor of the *SensoMAG S30* type, heat sensor of the *SensoMAG* *R20* type*,* fixed on the ceiling, and a manual sensor of the *SensoIRIS MCP150* type*,* if the fire is noticed visually. The manual sensor shall be fixed on the wall at a height of h=1.5 m from the floor level. The sound signaling device shall be installed at a height of h=2.5 m from the floor level. The signaling conductor shall be mounted in embossed tubes of PVC fixed on the constructions of the walls and ceiling. The alarm system shall be supplied with electrical power through a separate group from the cabinet ЩО1. For the safe electrical power supply to the signalizing system, a reserve power source is provided, of the RIP type, -220/=12V. The alarm system should be earthed.

6.17. *Security alarm system:*

The security alarm system has been developed in accordance with the requirements of the local normative documents: РД 78,145-93; NCM 2.08.02-89 and "Power equipment installation rules".

The PC-1832 security alarm device shall be installed at a height of 1.8 m from the floor level. The place of installation shall be coordinated with the Beneficiary. Combined detectors ИК + glass structure breakage – SRPG, infra-red detectors – ИК + electromagnetic detectors – CMK shall be installed in the guarded rooms. The system networks shall be built of CQR-6 cable and ВВГ-3x1.5 conductors, hidden inside the dropped ceiling, only on the sectors for the connection of detectors the cable shall be mounted in flexible PVC tubes with Ø=16-25mm. The power supply of the security system shall be of I category, a reserve power source of the RIP type, -220/=12V, shall be provided for that. The security alarm system should be earthed in accordance with "Power equipment installation rules".

***External engineering systems***

*6.18. Electrical power supply:*

The provision of the fire/rescue stations with electrical power shall be done through the low voltage lines AEE – 0.4kV,in accordance with the technical conditions / CT *Nr.* *P30202020090001,* of 17.09.20*,* issued by Î.C.S. "Premier Energy Distribution"*,* from the Transformation Station PT-394N for Baimacliavillage and *Nr. 2332,* of 09.09.2020*,* issued by Î.C.S. "Red Nord", from the Transformation Station PT-609, for Pirlita village. The fire/rescue stations belong to the II Category electricity consumers. Given the fact that the local electrical power networks may ensure only the III Category of power supply source reliability, the technical design (Album EEF/IEI), envisages, for both fire/rescue stations, one reserve power supply source, from mobile diesel generators. The main technical parameters of the designed generic object are: voltage – 0.38/0.22 kV; estimated consumption N=15 kWt and current – 25 A. In accordance with the Technical Conditions (CT), electrical counter nodes of the "BZUM-TF" type shall be installed on the objects,with three-phase electronic counter 5-60, 380В connected directly.

From the transformation stations (PT) the supply networks of 0.4kV shall be mounted, of self-bearing conductors of the SIP-2 type, 3х35+1x54.6 mm², on the existing reinforced concrete pillars (as the case may be). On the pillars where the PEN earthing is made, a protective device against overvoltage shall be installed, of the (УЗИП), ОПН SPB\*/10 (A35\*\*) type. On the walls of the building, up to the height of 3 m, the electrical cables/conductors shall be mounted in metal tubes.

All the electrical works should be performed in accordance with the normative requirements of the *Power equipment installation rules and SNiP 3.05.06-86.* Before starting the mounting of electrical equipment, the representative of Î.C.S*. "Premier Energy Distribution"* should be invited to the object.

*6.19. Cold drinking water supply and sewage networks.*

The fire station shall be connected to the existing public cold-water supply networks, from the connection chimney according to the technical conditions, with polyethylene pipes - PE100, SDR 17, PN 10, diameter Ø=25 mm. The external household sewage networks shall be mounted of PVC pipes, SN 4, diameter Ø=110÷160 mm. The sewage pipe with the diameter of Ø=160 mm shall be mounted in a protective metal tube with the diameter Ø=315 mm, GOST 10704-91. The sewage sector for free wastewater drainage to the drainage pit from the firetruck compartment shall be mounted of PVC pipes with the diameter Ø=110 mm, and the forced sewage sector shall be of polyethylene pipes - PE100, SDR 21, SN 6, diameter Ø=63 mm. This sewage shall be provided with hydrocarbon separator, q=0.5 l/sec, pressure extinction pipe mounted in the septic tank, and drainage pump of the *"*Willo Drain*"* TM-32 type, G=1.5m3/hour, H=10 m, N=0.55kwt.

*Sewerage tank.* The household water shall be accumulated in an underground tank – septic tank, impermeable, standard, with the volume V=3000L. The septic tank shall be mounted on the territory of the fire station, near the building, at a distance of 5-6m.

The chimneys designed for the water supply and sewage networks shall be made of precast reinforced concrete items - B15, КЦД-10, КЦП-10, КЦ-10, КД-10, КЦО-1, with the diameter Ø=1000 mm, cording to p.t. 902-09-022.84.

Before starting the earthworks, the representatives of the organizations operating the engineer networks should be invited to mark the places of intersection with the designed water supply and sewage networks.

***Territorial organization and planning***

6.20 The area of the plots of land allocated by the LPA from the public lands for the designed fire stations is, accordingly: for Pirlita village - 0.18 ha and for Baimaclia village – 0.113 ha. The area distributed to the project is, accordingly: 765 m2 and 890 m2; but the areas occupied by the building - 153 m2; green space area – 462 m2; and pavement area – 149.5 m2, are equal for both objects. The LCI (land cover index) is reported to the area designated to the project - 765 m2 and 890 m2 and equal to 20% and 16.2%, accordingly.

6.21 The design for the location of the building, vertical planning and organization of the territory of the fire/rescue stations in both villages was developed on the basis of the technical-geodesic prospections at a scale of 1:500.

6.22 *Sidewalks.* The access ways to the building of the fire station (sidewalks) shall be paved with sidewalk tiles and curbstone. The curbstone shall be of concrete of the B.100.20.8 type, GOST 6665-91 The vibro-pressed sidewalk tiles, with the thickness h=5.0 cm, GOST 17608-91, of the Iacobas type or of an equivalent one, shall be placed on a layer of cement-sand dry mix, with the thickness δ=50 mm, in proportion of 1:3, on a sand foundation, GOST 8736-93, with the thickness δ=100 mm, on the ground compacted up to the value of λ=1.6 t/m3.

6.23 *Firetruck parking.* The access way / parking for the firetruck shall be paved with a layer of cement-monolithic concrete, mark - B25, F-200, W-6, with the thickness δ=180 mm, GOST 26633-91, on a leveling layer of black sand with the thickness δ=30 mm, placed on a foundation layer of sand-gravel mix, with the thickness δ=150 mm. The curbstone for this sector shall be of the curbstone type used for roads, B.100.30.15, GOST 6665-91, placed on a fixing layer of concrete of B15 mark, GOST 26633-91, with the thickness δ=100 mm. *Attention!* In the place of junction with the sidewalks, the road type curbstone shall be mounted horizontally. The monolithic concrete coverage shall have, at each distance of 3.0 m, compensation joints filled with round rubber profile, diameter Ø 5.0mm, and flexible bituminous mastic resistant to frost. Before starting the pavement works, the ground under the access way and sidewalks shall be compacted up to the value λ=1.6 t/m3. The removal of rainwater from the paved areas shall be organized on the relief with the help of an incline i=0.02 and curbstones. The access way to the building for the firetruck shall be provided with an automatic barrier.

1. **Equipment marking**

The entire equipment should be marked with original manufacturer’s plates, which should contain at least the year of manufacture, main technical parameters and type/ID of the equipment. The installed cables should be marked at the start-point and endpoint of the networks. All the textual markings necessary for system operation should be in Romanian and Russian.

1. **Acceptance at the completion of works**

After the construction works are finished, the equipment provided in the contract is installed and tested in the corresponding way, the staff training is performed and the technical documents are transmitted, the procedure of putting into operation of the object after the completion of works shall be performed. All the costs relating to the organization of the testing of installed systems and staff training shall be incurred by the contractor.

1. **Warranty period**

The warranty period for the works shall start on the day of acceptance of the object at the completion of works and shall be of 12 months for the equipment, tools, and 36 months for works and materials.