# *ANNEX II + III:* TECHNICAL SPECIFICATIONS + TECHNICAL OFFER

**Contract title: Procurement of Border Surveillance System for project "Safer climate within the Romanian-Serbian border Area - SAFE"**

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**Publication reference:** **RORS00004 - TD05**

**Columns 1-2 should be completed by the contracting authority**

**Columns 3-4 should be completed by the tenderer**

**Column 5 is reserved for the evaluation committee**

Annex III - the contractor's technical offer

The tenderers are requested to complete the template on the next pages:

* Column 2 is completed by the contracting authority shows the required specifications (not to be modified by the tenderer),
* Column 3 is to be filled in by the tenderer and must detail what is offered (for example the words ‘compliant’ or ‘yes’ are not sufficient)
* Column 4 allows the tenderer to make comments on its proposed supply and to make eventual references to the documentation

The eventual documentation supplied should clearly indicate (highlight, mark) the models offered and the options included, if any, so that the evaluators can see the exact configuration. Offers that do not permit to identify precisely the models and the specifications may be rejected by the evaluation committee.

The offer must be clear enough to allow the evaluators to make an easy comparison between the requested specifications and the offeredspecifications.

**General Requirements**

* All requirements stated and outlined in this document must be regarded as mandatory and the minimum acceptable criteria. All requirements outlined in this document are accompanied by the phrase "or equivalent".
* The tenderer is required to provide the specifications of the offered items in the Technical Offer, including details such as the manufacturer, product type, model, and country of origin. All documentation must be provided in English or Serbian, both in hardcopy and electronic formats.
* The selected contractor is required to provide all necessary documentation for the completed works and installed equipment in accordance with the relevant legal regulations in the Republic of Serbia including as-built project on the basis of which, the qualitative acceptance of the system will be carried out.

| **1.**  **Item number** | **2.**  **Specifications required** | **3.**  **Specifications offered** | **4.**  **Notes, remarks,  ref to documentation** | **5.**  **Evaluation committee’s notes** |
| --- | --- | --- | --- | --- |
|  | **FIXED BORDER SURVEILLANCE SYSTEMS** |  |  |  |
| **0.** | **GENERAL REQUIREMENT** |  |  |  |
| 0.1 | As part of this project, it is necessary to implement five stationary systems for monitoring the state border, namely on the border of the Republic of Romania. |  |  |  |
| 0.2 | The tenderer is obliged to design the construction of the border surveillance system according to the "turnkey" system without subsequent requests to the client after the signed contract and without any subsequent costs to the client after the signed contract.  The border surveillance system must be built according to the description given in the “System Design” document and in accordance with the technical specifications for the equipment and also in accordance with the relevant legal regulations in the Republic of Serbia. |  |  |  |
| 0.3 | For the locations that are indicated in the „System Project“ document, which is an integral part of the tender documentation, in case of signing the contract, the selected bidder will have the obligation to:   * Perform all construction-craftsmanship works (earthworks, concrete, reinforced concrete and reinforcement works, locksmithing etc...). * Carry out all work for the installation of Ethernet network (Ethernet cable wiring) and power network connection. * Carry out all work on the creation and installation of grounding and lightning protection. |  |  |  |
| 0.4 | The selected bidder will have the obligation in all locations where he installs the equipment to carry out Ethernet network (Ethernet cable wiring) and power network connection from the location of the power connection, to each devices that defined at each individual location within the scope of this project. |  |  |  |
| 0.5 | The selected bidder will have the obligation to create of a test plan and test scenarios for testing each individual equipment of the system as a whole.  System performance testing according to the test plan and test scenarios for a minimum of one /1/ working day (per location) in day and night conditions.  Handover of technical documentation and user instructions in Serbian.  Trial operation of the system in real working conditions for 3 days.  The handover record after the system trial run as proof of the completion of the system installation. |  |  |  |
| 0.6 | The selected bidder will have to have its own Help Desk system for reporting, monitoring and incident management purposes active and available 24/7 all 365 days a year including holidays and non-working days. The Bidder is obliged to provide access for the Client's authorized staff via an Internet browser to its own (the Bidder's) Help Desk system. The provider's Help Desk must be in Serbian or English.  In order to report errors and malfunctions on the devices, the selected bidder must have its own technical support ( Help Desk ) set up to receive requests, which will be handled by the Client's employees by filling out the web form or email form. The selected bidder also undertakes to submit the electronic mail address of its technical support where requests for intervention will be sent. The customer must have access to the portal of the selected bidder, through which he must be able to monitor the status of reported errors and breakdowns and the associated times.  It is not possible to connect to the Client's location independently via VPN, but a personal arrival of the employee of the selected bidder to the Client's location is required. The Bidder can provide remote access only with the constant control of the Client's employees.  Likewise, it is not possible to connect the employees of the selected bidder or equipment manufacturer directly to the devices themselves, that is, any modem connection to the selected bidder or manufacturer is not allowed. |  |  |  |
| 0.7 | The selected bidder has the obligation to provide training for all system components as specified in the technical specifications of each individual component. |  |  |  |
| **1.** | **Medium-range stationary system (thermal imaging camera - day/night camera)**  **Quantity: 5** | Enter the manufacturers name and model: |  |  |
| 1.1 | The basic system configuration (multi-sensor configuration) consists of the following components:   * HD thermal imaging camera (MWIR or LWIR) * HD camera for use in day (color)/night operating conditions * Controllable mobile stand (Pan/Tilt) * Joystick Control Unit for system management by the operator |  |  |  |
| 1.2 | The HD thermal imaging camera and the HD day/night camera must share one pan/tilt mechanism. |  |  |  |
| 1.3 | The HD thermal imaging camera and the HD day/night camera must be compatible with the ONVIF protocol for the communication of network cameras with other devices |  |  |  |
| 1.4 | The system must have the ability to simultaneously display the video stream from the HD thermal imaging camera and from the HD day/night camera. |  |  |  |
| 1.5 | Video streams from the stationary system would be recorded in the best quality on the central VMS server, and streams of lower quality (minimum 720p) would be transmitted in real time via the network to the local control centres (LCC) of the border police stations. For the purposes of budgeting the capacity of the IT network, in order to transmit video signals from cameras in real time at a minimum of 720p, a maximum of 3Mb/s transmission bandwidth per video channel is available. A stationary system that needs more than 3 Mb /s bandwidth to transmit a video signal in 720p quality in real time is not acceptable to the client. |  |  |  |
| 1.6 | HD Thermal imaging camera and HD day/night camera must have continuous zoom |  |  |  |
| 1.7 | Built-in-test (BIT) for all sub-components e.g. HD Thermal imaging camera, HD day/night camera and Pan/Tilt shall be available from the system over the network. |  |  |  |
| 1.8 | Real time status of all sensors shall be automatically distributed over Ethernet with a refresh rate |  |  |  |
| 1.9 | The system shall have electronic video stabilization integrated at camera level and working on both thermal imaging camera and day/night camera simultaneously. |  |  |  |
| 1.10 | The system shall have an Automatic Video Tracker working in either the HD thermal imaging camera and HD day/night camera |  |  |  |
| 1.11 | It shall be possible to slave the HD day/night camera zoom level to the HD thermal imaging camera zoom so both cameras automatically show the same FOV |  |  |  |
| 1.12 | Minimum operating temperature range: –30°C to +50°C |  |  |  |
| 1.13 | IP rating: minimum IP66 for the full system |  |  |  |
| 1.14 | **HD Thermal Imaging Camera** - At least 1024 x 576 pixels detector resolution |  |  |  |
| 1.15 | Wave band: LWIR or MWIR |  |  |  |
| 1.16 | Zoom minimum 15 x continuous zoom |  |  |  |
| 1.17 | Horizontal Field of View  ≤ 6º or narrower to ≥ 15º or wider |  |  |  |
| 1.18 | Depending on the wave band of the HD Thermal Imaging Camera:   * NETD for LWIR ≤ 55 mK * NETD for MWIR ≤ 25 mK |  |  |  |
| 1.19 | Minimum Range performance   |  |  | | --- | --- | | Human  1.8m x 0.5m | 6 km | | Vehicle  2.3m x 2.3m | 12 km | |  |  |  |
| 1.20 | Automatic heaters and lens defroster |  |  |  |
| 1.21 | Minimum Black Hot / White Hot polarity |  |  |  |
| 1.22 | Image stabilization |  |  |  |
| 1.23 | Focus: autofocus and manual focus |  |  |  |
| 1.24 | **HD day (colour)/night camera** - At least 1280 x 720 pixels detector resolution |  |  |  |
| 1.25 | Minimum optical Field of View:  ≤ 2.5º or narrower to ≥ 60º or wider |  |  |  |
| 1.26 | Zoom:   * Minimum 30x continuous optical zoom * Minimum 10x continuous digital zoom |  |  |  |
| 1.27 | Minimum illumination:   * 0.01 lux in colour at minimum 25FPS |  |  |  |
| 1.28 | Minimum 120dB Wide dynamic range |  |  |  |
| 1.29 | Auto Gain (AGC), Auto White Balance (AWB), Auto AE (Auto Exposure) Control |  |  |  |
| 1.30 | Automatic switching to B&W low-light mode |  |  |  |
| 1.31 | Minimum Range performance   |  |  | | --- | --- | | Human  1.8m x 0.5m | 6 km | | Vehicle  2.3m x 2.3m | 12 km | |  |  |  |
| 1.32 | Automatic heaters and lens defroster |  |  |  |
| 1.33 | Continuous autofocus and manual focus |  |  |  |
| 1.34 | Image stabilization |  |  |  |
| 1.35 | **PAN/TILT MECHANISM** - Continuous rotation in azimuth n x 360 |  |  |  |
| 1.36 | PAN/TILT MECHANISM - The vertical angle of the moving mechanism is -90° to +-90° |  |  |  |
| 1.37 | PAN/TILT MECHANISM - The rotation speed of the stand is: ≥ 100°/s |  |  |  |
| 1.38 | PAN/TILT MECHANISM - The speed of moving the stand vertically (tilt): ≥ 80°/s |  |  |  |
| 1.39 | PAN/TILT - positioning accuracy ≤ ± 0.5 mrad |  |  |  |
| 1.40 | Support of at least 10 preset scene locations |  |  |  |
| 1.41 | **Operator Control Software -** Windows operating system |  |  |  |
| 1.42 | Shall not need any license |  |  |  |
| 1.43 | Shall provide full remote command & control of all camera system functions |  |  |  |
| 1.44 | Shall provide an offline map background based on free raster maps |  |  |  |
| 1.45 | Camera system shall be geo-referenced in the map |  |  |  |
| 1.46 | Current camera direction and current FOV shall be indicated in the map and updated in real time |  |  |  |
| 1.47 | It shall be possible to move the camera to a certain location just by clicking a point in the map |  |  |  |
| 1.48 | Targets measured with the LRF shall be indicated in its real position in the map and the target GPS position shall be available |  |  |  |
| 1.49 | Shall include a configurable video wall showing the IP video streams provided by the camera |  |  |  |
| 1.50 | Shall provide support for USB joysticks |  |  |  |
| 1.51 | Shall provide a scan list with up to minimum 10 positions. It shall be possible to create, save & load multiple scan lists |  |  |  |
| 1.52 | The scan list shall be completely configurable and shall include at least: azimuth and elevation position, FOV for that point, focus setting for that point, autofocus activation for that point, dwell time, speed to move to the next point and it shall be possible to make individual points active/in-active |  |  |  |
| 1.53 | It shall be possible to make screenshots from any of the videos in the video wall |  |  |  |
| 1.54 | It shall be possible to select either the IR or the TV camera to be the active camera. Corresponding functions assigned to the joystick shall change automatically |  |  |  |
| 1.55 | It shall be possible to mark locations in the map and assign an ID or name. |  |  |  |
| 1.56 | The operator software shall have the capabilities of logging user actions |  |  |  |
| 1.57 | The operator software shall support multiple users with individual profiles. The operator shall be able to customize e.g. the toolbar, video wall and joystick button configurations |  |  |  |
| 1.58 | Different user levels shall be supported e.g. normal user and administrator |  |  |  |
| 1.59 | The operator software shall support Windows extended desktop in order to use up to 3 screens per workstation |  |  |  |
| 1.60 | **TRAINING:** The supplier has an obligation to provide training to system users at each location of the local centre where the system console is installed. The training must last a minimum of four /4/ hours of theoretical classes and eight /8/ hours of practical exercises on the system (minimum 4 hours in daytime conditions and a minimum of 4 hours in night conditions) for a minimum of 10 police officers at each location.  The supplier is obliged to provide technician training in the regional centres for Romania for a minimum of four /4/ hours for a minimum of two /2/ technicians who must learn to detect faults on each individual part of the system (troubleshooting), disconnection and reconnection of each individual part of the system for the purpose of sending it to service, putting the system into operation after returning the equipment from the service.  The supplier has the obligation to hold training for technicians and engineers at the Ministry of Internal Affairs in Belgrade for a minimum of eight /8/ hours, for a minimum of two /2/ technicians and two /2/ engineers. The training must include all elements of the first line of support for the operation of the system. After the training, the technical staff of the Client who have passed the training should be able to independently configure the system, manage the system and detect problems in the operation of the system as part of the first line of support.  If the instructor who will hold the training does not speak the Serbian language, the supplier must organize a translator for the Serbian language at no additional cost to the client. At the end of the training, the client's employees must be trained to fully handle the equipment, which includes setting the necessary parameters for the operation of the device in day and night operation, dubbing and reviewing the recorded material, and knowing all the functions of the device. accompanying parts of the kit. |  |  |  |
| **2.** | **Telecommunication pole 24 m**  **Quantity: 5** | Enter the manufacturers name and model: |  |  |
| 2.1 | **Telecommunication** pole is constructed as a spatial lattice structure with a minimum of three edges of height of 24 meters (± 5%) |  |  |  |
| 2.2 | The pole is made of steel construction and is hot-dip galvanized |  |  |  |
| 2.3 | The column is modular, made in segments. Within the segment, connections are welded or made with screw connections, and connections between segments are made with screw connections |  |  |  |
| 2.4 | All elements of the load-bearing steel structure of the column must be made of tubular or corner profiles |  |  |  |
| 2.5 | The estimated working life according to SRPS EN 1990 or EN 1990 (Basics of structural design) or equivalent for this column is class 3 - 15 to 30 years |  |  |  |
| 2.6 | The hot-dip galvanizing process of the pole must be in accordance with SRPS EN ISO 1461 or EN ISO 1461 (100-120μm) or equivalent. The construction is according to SRPS EN ISO 12944 or EN ISO 12944 in exposure class C4 or equivalent |  |  |  |
| 2.7 | The column must be designed for a wind speed of at least Vb =35 m/s according to SRPS EN 1991-1-4 or EN 1991-1-4 or equivalent |  |  |  |
| 2.8 | Column deflection at the top d<0.4m |  |  |  |
| 2.9 | The maximum permissible column torsion is 0.09 degrees |  |  |  |
| 2.10 | The maximum deviation of the top of the pillar from the vertical side must not be greater than H/1000, where H is the height of the pillar |  |  |  |
| 2.11 | The entire steel structure must be made in accordance with the norms SRPS EN 1090-1 or EN 1090-1 or equivalent and SRPS EN 1090-2 or EN 1090-2 or equivalent |  |  |  |
| 2.12 | The bearing capacity of the pole must be designed for equipment on the pole with a total mass of at least 350 kg |  |  |  |
| 2.13 | The pole must have vertical cable supports and rest and work platforms. On the top of pole must have platform |  |  |  |
| 2.14 | The pole must have a signal light carrier |  |  |  |
| 2.15 | An appropriate LED based Low Intensity beacons must be supplied on the top of the pole (LED tower obstruction light, 360 degree coverage for each flash head, minimum IP66, ICAO Type B/Type E).  For the offered signal light, the bidder must submit the manufacturer's documentation, which contains all the technical data to prove the conformity of the offered product with the technical requirements of the customer. |  |  |  |
| 2.16 | The pole must be painted red and white. |  |  |  |
| 2.17 | The pole must have a climbing ladder with a safety guide. The ladder is placed on the inside of the column. |  |  |  |
| 2.18 | The pole must have a lightning rod at the top of the pole raised at least 1 meter above the equipment at the top of the pole and the grounding connection |  |  |  |
| 2.19 | The bidder`s obligations are as follows:  draft and prepare complete technical documentation in accordance with rulebooks, technical conditions and other valid legislation of the Republic of Serbia based on which the appropriate legal document of the body responsible for urban planning is obtained, i.e. the “Decision on Approval of the Execution of Works” pursuant to Article 145 of the Law on Planning and Construction;  • perform previous works, such as geological and hydrogeological research with the preparation of a geo-mechanical detailed study, or to download data from any existing database for each location;  • hire an independent business entity registered for the preparation of technical control of technical documentation, based on which a decision on approval of the execution of works is issued;  • carry out geodetic markings in accordance with the project documentation, monitor the verticality of the building-pillar during the execution of the works, make a survey of the position of the foundation and the top of the pillar, prepare a detailed study on the surveyed foundations and submit it to the authority that issued the decision on approval of construction in order to issue a certificate of the surveyed foundations and structure;  • submit to the Ministry (Contracting Authority) the Decision on Approval of the Execution of Works and complete technical documentation in 4 copies in printed and digital form;  • draft a design of the constructed facility;  • After the completed works, the bidder is to hire an independent commission to conduct a technical inspection of the constructed facilities (pillars);  • Through the CEOP application, the bidder is to submit requests for conditions, permits, notification of commencement of works, request for issuance of a use permit after a technical inspection and implement changes in the real estate cadastre:  • submit all the necessary documentation for completed works and installed equipment in accordance with the relevant legal regulations of the Republic of Serbia, including the project of the constructed facility, based on which the quality acceptance of the system will be carried out. |  |  |  |
| **3.** | **WDR Bullet IP camera**  **Quantity: 20** | Enter the manufacturers name and model: |  |  |
| 3.1 | Sensor type 1/2.8" or 1/3'' or 1/4'' in CMOS technology or better |  |  |  |
| 3.2 | Sensor type 1/2.8" or 1/3'' or 1/4'' in CMOS technology or better |  |  |  |
| 3.3 | Outputs minimum 2MP (1920 × 1080) @25/30 fps |  |  |  |
| 3.4 | Built-in IR LED, IR distance: Distance minimum up to 40 m |  |  |  |
| 3.5 | Minimum Illumination: BW 0.01 Lux at F1.6 |  |  |  |
| 3.6 | Lens Type - Motorized vari-focal |  |  |  |
| 3.7 | Focal Length: minimum 3 mm–9 mm |  |  |  |
| 3.8 | Perimeter Protection - camera can recognize human and vehicle accurately, motion detection |  |  |  |
| 3.9 | The camera must be able to recognize a dark object in front of a large bright area (WDR - Wide Dynamic Range function) |  |  |  |
| 3.10 | The camera must have backlight compensation that helps the dark parts on the light background to be seen, and not just the dark field (BLC function - Back light Compensation) |  |  |  |
| 3.11 | Perimeter Protection - camera can recognize human and vehicle accurately, motion detection |  |  |  |
| 3.12 | Video signal compression at least according to H.264 and MJPEG or newer standards |  |  |  |
| 3.13 | 12V DC/PoE power support |  |  |  |
| 3.14 | Supports max. 256 GB Micro SD card |  |  |  |
| 3.15 | The signal-to-noise ratio (S/N Ratio) is at least 50 dB or better |  |  |  |
| 3.16 | The degree of protection of the housing must meet the degree of minimum IP 67 or better |  |  |  |
| 3.17 | Degree of protection against mechanical shocks of the housing: minimum IK 10 or better |  |  |  |
| 3.18 | The temperature range of the camera is in the minimum range from - 20°C to + 50°C |  |  |  |
| 3.19 | Video streams from the camera would be recorded in the best quality on the central VMS server |  |  |  |
| **4.** | **Central video server and video management software (VMS)**  **Quantity: 1** | Enter the manufacturers name and model: |  |  |
| 4.1 | **CENTRAL VIDEO SURVEILLANCE APPLICATION SERVER**  processor type: minimum one processor with minimum 8 cores, 20 execution threads, minimum frequency 2.5 GHz with possibility of expansion on minimum two CPU |  |  |  |
| 4.2 | RAM: minimum 2x 16GB or 1x 32GB with possibility of expansion (minimum 12 DIMMs per processor) |  |  |  |
| 4.3 | system disks: At least 2 x 480GB SSD HDD in RAID 1 field |  |  |  |
| 4.4 | disks for video archive: minimum size of RAID 5 field 12TB with possibility of internal storage capacity expansion to minimum 55 TB |  |  |  |
| 4.5 | RAID controller: Support for minimum RAID levels 0, 1, 5, 10 |  |  |  |
| 4.6 | network card: Integrated Ethernet adapter - min 4x 1Gb/s RJ45 |  |  |  |
| 4.7 | power supply: minimum two redundant hot-swap |  |  |  |
| 4.8 | cooling: minimum four redundant hot-swap fans |  |  |  |
| 4.9 | Form factor: maximum 2U rack-mount. All accessories required for installation in the server cabinet should be delivered with the device |  |  |  |
| 4.10 | Drive bays: minimum 12 SFF (front) and 2 LFF (rear) hot-swap drive bays |  |  |  |
| 4.11 | Ports: minimum 2 x USB and 1 x VGA port |  |  |  |
| 4.12 | The latest and most recent version of the MS Windows operating system or an equivalent operating system, that is, the operating system that will fully support the operation of the VMS program package, installed and supplied together with the licenses necessary for reinstallation. |  |  |  |
| 4.13 | **CENTRAL SERVER APPLICATION FOR VIDEO SURVEILLANCE (VMS)**  the possibility of centralized monitoring of cameras in remote locations |  |  |  |
| 4.14 | supports an unrestricted number of users, hardware devices, servers and sites. It allows the expansion of any installation as it is required. VMS should be compatible with the existing one Milestone XProtect Corporate 2022 R1 software which is use at the border |  |  |  |
| 4.15 | Included license for recording minimum 42 cameras |  |  |  |
| 4.16 | possibility of authentication of user access, system configuration and recording of logs |  |  |  |
| 4.17 | included management client for system administration (recording servers, devices, security settings, rules and logs) |  |  |  |
| 4.18 | supported management server redundancy with a failover server |  |  |  |
| 4.19 | the possibility of user login to the system using Microsoft Active Directory, a local Windows user and a basic user account |  |  |  |
| 4.20 | export video to various formats, the possibility of exporting in an encrypted format with the playback application turned on |  |  |  |
| 4.21 | recording of system and audit logs |  |  |  |
| 4.22 | support for the display of graphic maps with the ability to display in multiple layers with the location and the ability to interact and control each camera and the entire surveillance system |  |  |  |
| 4.23 | Supports reception, storage and export of metadata, including metadata from camera-resided video ana-lytics and location data |  |  |  |
| 4.24 | Allows users to mark video sections of interest and add descriptive notes for later analysis or sharing with other users (Bookmarking ) |  |  |  |
| 4.25 | Customizable real-time system monitoring dash-board and report function for proactive maintenance of the VMS installation (System Monitor ) |  |  |  |
| 4.26 | enables full video interoperability in multivendor installations using a standardized ONVIF compliant videoout interface |  |  |  |
| 4.27 | Simultaneous digital multi-channel MJPEG, MPEG4, MPEG-4 ASP, MxPEG, H.264 and H.265 video record-ing of IP cameras and IP video encoders without any software limitations on number of cameras per server |  |  |  |
| 4.28 | Adaptive streaming enables a lower resolution stream from the recording server to the client when a high resolution is not required |  |  |  |
| 4.29 | Record more than 30 frames per second per camera |  |  |  |
| 4.30 | Support for both IPv4 and IPv6 addressing |  |  |  |
| 4.31 | Support for shutdown of recording server if record-ing storage becomes unavailable, to enable fail over to take over |  |  |  |
| 4.32 | Definition of one or more storage containers with in-dividual archiving schemes and retention times. Re-cording capacity is limited only by disk space |  |  |  |
| 4.33 | Hardware wizard to add devices; automatically using Universal Plug and Play (UPnP) discovery, via IP net-work range scanning, or using manual device detec-tion. All methods support automatic or manual model detection |  |  |  |
| 4.34 | Adjust settings such as brightness, color level, com-pression, maximum bit rate, resolution and rotation per camera or camera group |  |  |  |
| 4.35 | Select and configure video format, frames per sec-ond (FPS), resolution and quality for the video streams used per camera |  |  |  |
| 4.36 | The snapshot function enables operators to produce instant visual documentation of a camera by saving the camera image to a file, or sending it directly to a printer. |  |  |  |
| 4.37 | Secure video evidence handling with a digital signature  of exported video material that enables users to  verify the video has not been modified or tampered |  |  |  |
| 4.38 | Supports Bing, Google and OpenStreetMap map services. Supports geo-referenced GIS maps (shapefiles). Supports offline OpenStreetMap |  |  |  |
| 4.39 | If the VMS requires any activation key for the complete functionality, the supplier is obliged to include it in his offer and deliver it together with the VMS server and VMS application.  The supplier is obliged to ensure that the delivered VMS contains the latest version of the manufacturer's system, as well as all other necessary software and licenses that may be necessary for the required technical characteristics (hardware devices and software licenses). |  |  |  |
| **5.** | **Camera monitoring workstation for monitoring and managing cameras with support for simultaneous operation**  **Quantity: 2** | Enter the manufacturers name and model: |  |  |
| 5.1 | COMPUTER for monitoring and managing cameras with support for simultaneous operation with a minimum of three monitors, minimum 23.5" and LCD screen minimum 65". |  |  |  |
| 5.2 | **PROCESSOR:** minimum 10-core processor, core speed minimum 2.8Ghz |  |  |  |
| 5.3 | **HARD DISK (HDD):**   * At least 1xSSD with a capacity of at least 240 GB * Minimum 1x1 TB |  |  |  |
| 5.4 | **MEMORY:** At the time of delivery, a minimum of 32GB must be delivered with the possibility of additional expansion up to a minimum of 64GB |  |  |  |
| 5.5 | **VIDEO CONTROLLER -** support for simultaneous independent display on at least 4 screens, with a resolution of at least 3840 x 2160 |  |  |  |
| 5.6 | **NETWORK CARD -** At least one port for Gbit LAN |  |  |  |
| 5.7 | **OPTICAL UNIT:** DVD±RW Dual-Layer drive (can also be offered as an external unit) |  |  |  |
| 5.8 | **CONNECTORS:**   1. Audio input/output minimum x1 2. minimum 6 x USB of which minimum two /2/ from the front of the computer 3. minimum one connector required to connect the joystick to control the cameras   **NOTE:** when choosing a computer with a sufficient number of USB connectors, the supplier must take care that all USB connectors on the front of the computer must remain free for the needs of the user (USB stick, external HD, etc.). |  |  |  |
| 5.9 | **HOUSING -** locking option (prevents opening the case and removing components) |  |  |  |
| 5.10 | **POWER SUPPLY**   * Active PFC ( Power Factor Correction ) * the power supply must be at least 30% stronger than the sum of the power of all components in the computer, and at least 700 W if the aforementioned condition leads to the need for a weaker power supply. |  |  |  |
| 5.11 | **OTHER:** USB keyboard, USB optical mouse and pad, power cable, UTP network cable, JOYSTICK CONTROL UNIT for controlling pan/tilt cameras |  |  |  |
| 5.12 | The latest and most recent version of the MS Windows operating system or an equivalent operating system, that is, the operating system that will fully support the operation of the program package for monitoring and controlling the cameras, installed and supplied together with the licenses necessary for reinstallation. |  |  |  |
| **6.** | **Monitor minimum 23.5" LCD LED**  **Quantity: 6** | Enter the manufacturers name and model: |  |  |
| 6.1 | DIAGONAL (INCH): Minimum 23.5" |  |  |  |
| 6.2 | FORMAT : 16:9 |  |  |  |
| 6.3 | RESOLUTION: Minimum 1920 x 1080 |  |  |  |
| 6.4 | DISPLAY TECHNOLOGY: LCD LED |  |  |  |
| 6.5 | STATIC CONTRAST: Minimum 1,000:1 |  |  |  |
| 6.6 | DYNAMIC CONTRAST:  Minimum 20,000,000:1 |  |  |  |
| 6.7 | VISIBLE ANGLE: Minimum 178° / 178° |  |  |  |
| 6.8 | RESPONSE: maximum 5 ms |  |  |  |
| 6.9 | BRIGHTNESS: Minimum 250 cd/m² |  |  |  |
| 6.10 | ADDITIONAL POSSIBILITIES:  Height adjustment, a stand that enables the connection of three screens to one workstation |  |  |  |
| **7.** | **LCD screen minimum 65"**  **Quantity: 2** | Enter the manufacturers name and model: |  |  |
| 7.1 | Type: professional display (Professional Display) intended for 24/7 operation (24/7 operation) |  |  |  |
| 7.2 | Resolution: minimal 3840 x 2160 (ULTRA HD) |  |  |  |
| 7.3 | Screen diagonal: minimum 65 inches |  |  |  |
| 7.4 | Screen brightness: minimum 250 cd/m 2 |  |  |  |
| 7.5 | Contrast ( Image Contrast Ratio ): minimum 1000:1 |  |  |  |
| 7.6 | Viewing angle ( Viewing Angle – horizontal / vertical ): Minimum 178° / 178° |  |  |  |
| 7.7 | Response Time : maximum 9 ms |  |  |  |
| 7.8 | Connections: minimum 1 x HDMI input, 1 x USB, 1 x DisplayPort input, 1 x DisplayPort output, 1 x RJ-45, 1 x |  |  |  |
| 7.9 | Audio: Stereo audio |  |  |  |
| 7.10 | Additional equipment:   * wireless remote control, * wall bracket for the subject LCD |  |  |  |
| 7.11 | Additional equipment:   * wireless remote control, * wall bracket for the subject LCD |  |  |  |
| **8.** | **Work table for LCC and RCC**  **Quantity: 2** | Enter the manufacturers name and model: |  |  |
| 8.1 | At each location of the local (LCC) and regional centre (RCC), the supplier will be obliged to deliver office desk with minimum dimensions of 70 x 140 (width x length) and height of 76 cm (± 1 cm), shape of legs: side, wooden material (chipboard or equivalent), one chest of drawers with at least 3 drawers is delivered with the desk. |  |  |  |
| **9.** | **Work chairs for LCC and RCC**  **Quantity: 4** | Enter the manufacturers name and model: |  |  |
| 9.1 | At each location of the local (LCC) and regional centre (RCC), the supplier will be obliged to deliver two /2/ work chairs with armrests - the structure of the chair is metal, the seat is upholstered, based on wheels that enable mobility, and the seat itself is height-adjustable and can be rotated 360°, maximum load: 120 kg or more |  |  |  |
| **10.** | **Microwave radio equipment - Split-mount edge node - indoor unit**  **Quantity: 15** | Enter the manufacturers name and model: |  |  |
| 10.1 | GENERAL: Microwave radio equipment, split-mount edge node delivering up to minimum 500 Mbps radio capacity, works on the frequencies of the Ministry of the Interior of Serbia **(14620-15230 MHz)** |  |  |  |
| 10.2 | TRANSMISSION SPEEDS: all necessary licenses must be supplied to enable radio capacity (per core) up to 100Mb/s |  |  |  |
| 10.3 | Radio Type: IP Packet |  |  |  |
| 10.4 | Radio Configurations: 1+0, 2+0, 1+1 |  |  |  |
| 10.5 | Radio Features:   * Multi-Carrier Adaptive Bandwidth Control * Protection and Diversity: HSB, SD * High spectral utilization: QPSK to 2048 QAM |  |  |  |
| 10.6 | Ethernet Interfaces (minimum)   * 2 x 10/100/1000Base-T Electrical (RJ-45) * 2 x 10/100/1000Base-T Dual Mode Electrical or Cascading (RJ-45) * Management Interfaces – 2 x 10/100 Base-T (RJ-45) |  |  |  |
| 10.7 | Other Interfaces (minimum)   * 2 x radio interfaces (TNC) * 1x external alarms (DB9) * 2 x GbE optical interfaces (SFP) |  |  |  |
| 10.8 | Supported Ethernet Standards (minimum)   * 10/100/1000base-T/X (IEEE 802.3) * Ethernet VLANs (IEEE 802.3ac) * Virtual LAN (VLAN, IEEE 802.1Q) * Class of service (IEEE 802.1p) * Provider bridges (QinQ – IEEE 802.1ad) |  |  |  |
| 10.9 | management based on SNMP. Network management system that can monitor network element status, provide statistical and inventory reports, download software and configuration to elements in the network. |  |  |  |
| 10.10 | Indoor Mounting: 19” rack unit maximum 1 RU |  |  |  |
| 10.11 | WORK CONDITIONS:   * Ambient temperature: minimum range of -5° to +50°C |  |  |  |
| 10.12 | Power Input Specifications: 220-240 VAC or 48 VDC. If the power supply is 48 VDC, the supplier must also deliver converter 220V to 48V |  |  |  |
| 10.13 | Indoor unit should be designed with passive cooling (without ventilators) which suits harsh environments, increases reliability and minimizes ambient noise. |  |  |  |
| 10.14 | If the radio equipment requires any activation key for the complete functionality of the device, the supplier is obliged to include it in his offer and deliver it together with the radio device.  The supplier is obliged to ensure that the delivered radio equipment contains the latest version of the manufacturer's operating system, as well as all other necessary software and licenses that may be necessary for the required technical characteristics. |  |  |  |
| 10.15 | From maintenance perspective, configuration from faulty unit should be able to be loaded on replacement with replacing hardware only, without software reconfiguration (backup/restore configurations) |  |  |  |
| **11.**  **a)**  **b)** | **Microwave radio equipment - Split-mount outdoor unit (14620-15230 MHz)**  **– TX Low (14641-14725) - Quantity: 11**  **– TX High (15061-15145) - Quantity: 11** | Enter the manufacturers name and model: |  |  |
| 11.1 | GENERAL: Microwave radio equipment, split-mount outdoor unit delivering up to minimum 500 Mbps radio capacity, works on the frequencies of the Ministry of the Interior of Serbia **(14620-15230 MHz)** |  |  |  |
| 11.2 | TRANSMISSION SPEEDS: all necessary licenses must be supplied to enables radio capacity (per core) up to 100Mb/s |  |  |  |
| 11.3 | Tx Range: Up to 20 dB dynamic range |  |  |  |
| 11.4 | Configurable modulations: minimum QPSK, 8, 16, 32, 64, 128, 256, 512, 1024, 2048 QAM |  |  |  |
| 11.5 | Main configurations: 1+1, 1+0, 2+0, 2+2 |  |  |  |
| 11.6 | Supports PDH and Ethernet interfaces |  |  |  |
| 11.7 | Configurable channel bandwidths minimum 3.5, 7, 10, 14, 20, 25, 28, 29.65, 29, 30, 40 ,50, 56 MHz |  |  |  |
| 11.8 | Direct or remote antenna mount |  |  |  |
| 11.9 | management based on SNMP |  |  |  |
| 11.10 | WORK CONDITIONS:   * Ambient temperature: minimum range of -20° to +50°C * Relative Humidity: Up to 100% (all weather operation) |  |  |  |
| 11.11 | Compliant with ETSI, ITU-T, and ITU-R standards and frequency plans, for worldwide operation |  |  |  |
| 11.12 | If the radio equipment requires any activation key for the complete functionality of the device, the supplier is obliged to include it in his offer and deliver it together with the radio device.  The supplier is obliged to ensure that the delivered radio equipment contains the latest version of the manufacturer's operating system, as well as all other necessary software and licenses that may be necessary for the required technical characteristics. |  |  |  |
| **12.** | **Microwave antenna, 0.3m (14620-15230 MHz) Quantity: 6** | Enter the manufacturers name and model: |  |  |
| 12.1 | Antenna Type: High Performance Low Profile Antenna, dual polarized |  |  |  |
| 12.2 | Reflector Construction: One-piece reflector |  |  |  |
| 12.3 | Diameter, nominal: 0.3 m |  |  |  |
| 12.4 | Operating Frequency Band: minimum 14620-15230 MHz (14.620-15.230 GHz) |  |  |  |
| 12.5 | Fine Azimuth Adjustment Range: minimum ±15° |  |  |  |
| 12.6 | Fine Elevation Adjustment Range: minimum ±15° |  |  |  |
| 12.7 | Wind Speed, operational: minimum 150 km/h |  |  |  |
| 12.8 | Wind Speed, survival: minimum 200 km/h |  |  |  |
| **13.** | **Microwave antenna, 0.6m (14620-15230 MHz) Quantity: 14** | Enter the manufacturers name and model: |  |  |
| 13.1 | Antenna Type: High Performance Low Profile Antenna, dual polarized |  |  |  |
| 13.2 | Reflector Construction: One-piece reflector |  |  |  |
| 13.3 | Diameter, nominal: 0.6 m |  |  |  |
| 13.4 | Operating Frequency Band: minimum 14620-15230 MHz (14.620-15.230 GHz) |  |  |  |
| 13.5 | Fine Azimuth Adjustment Range: minimum ±15° |  |  |  |
| 13.6 | Fine Elevation Adjustment Range: minimum ±15° |  |  |  |
| 13.7 | Wind Speed, operational: minimum 150 km/h |  |  |  |
| 13.8 | Wind Speed, survival: minimum 200 km/h |  |  |  |
| 13.8 | Wind Speed, survival: minimum 200 km/h |  |  |  |
| **14.** | **Capacity License 100Mbps for Microwave radio equipment**  **Quantity: 28** |  |  |  |
| 14.1 | Capacity License 100Mbps License type: Permanent |  |  |  |
| **15.** | **2nd Modem Activation (license) for Microwave radio equipment Quantity: 15** |  |  |  |
| 15.1 | 2nd Modem Activation (license)  License type: Permanent |  |  |  |
| **16.** | **Switching Activation** **(license) for Microwave radio equipment Quantity: 15** |  |  |  |
| 16.1 | Switching Activation (license)  License type: Permanent |  |  |  |
| **17.** | **Network switch**  **Quantity: 5** | Enter the manufacturers name and model: |  |  |
| 17.1 | Minimum 24-port 2 full PoE Ethernet switch with 10/100/1000 Ethernet RJ-45 PoE + interfaces |  |  |  |
| 17.2 | Switch should come with dual fans and support redundancy |  |  |  |
| 17.3 | MEMORY: minimum 4/2 GB Flash/DRAM memory |  |  |  |
| 17.4 | BANDWIDTH OF THE DEVICE:   * Switching capacity minimum 50 Gbps * Forwarding rate minimum 40 Mpps |  |  |  |
| 17.5 | INTERFACES:   * minimum 24 x 10/100/1000 Ethernet RJ-45 PoE + interfaces * support for Perpetual PoE , PoE + works constantly when restarting the switch. |  |  |  |
| 17.6 | ADDITIONAL INTERFACES:   * A minimum of 4 pieces of SFP 1G uplink interface |  |  |  |
| 17.7 | The device must support at least the following options :   * + IEEE 802.1D Spanning Tree Protocol or equivalent   + IEEE 802.1p CoS Prioritization or equivalent   + IEEE 802.1Q VLAN or equivalent   + IEEE 802.1s or equivalent   + IEEE 802.1w or equivalent   + IEEE 802.1X or equivalent   + Eight output lines ( egress queues ) per interface   + Shaped Round Robin (SRR)   + Large frames (jumbo frames ) |  |  |  |
| 17.8 | The device must support at least the following protocols:   * Switch fundamentals - Layer 2, RIP, PBR, PIM Stub, Multicast , PVLAN, VRRP, PBR, QoS, FHS, 802.1x, MACsec-128, CoPP , SXP, SSO, IP SLA Responder * Security - MACsec-128 |  |  |  |
| 17.9 | All necessary software must be perpetual licensed. |  |  |  |
| 17.10 | WORK CONDITIONS:  The device must work smoothly under at least the following conditions:   * + Ambient temperature: minimum range from -5°C to 45°C   + Air humidity: minimum range 5% to 90% |  |  |  |
| 17.11 | DEVICE SIZE:   * The device must be delivered with all necessary parts for installation in the standard communication cabinet 19" * Chassis height maximum 1RU |  |  |  |
| **18.** | **UPS - Uninterruptible power supply device - 19" rack variant**  **Quantity: 5** | Enter the manufacturers name and model: |  |  |
| 18.1 | Output capacity: Minimum 4500 W / 5000 VA |  |  |  |
| 18.2 | UPS on-line technology or Line Interactive Automatic Voltage Regulator (AVR) |  |  |  |
| 18.3 | Input voltage - Nominal input voltage 230V input frequency 50/60 Hz +/- 10% (automatic detection)  Possible variations of the input voltage (adjustability of the input voltage): Minimum range 160 – 270V or higher |  |  |  |
| 18.4 | Output voltage - nominal output voltage: 230V frequency 50/60 Hz +/- 3 Hz  Harmonic Distortion: maximum 2% |  |  |  |
| 18.5 | Output connectors - minimum 4 x IEC 320 C13 |  |  |  |
| 18.6 | The operating temperature of the device is minimally in the range from 0°C to 40°C |  |  |  |
| 18.7 | The maximum height of the UPS is 5U |  |  |  |
| 18.8 | Additional accessories   * Power extension strip (minimum 1 meter of cable) with a minimum of 7 connection points and the possibility of connecting to the UPS output |  |  |  |
| 18.9 | The UPS must have battery capacity to support the operation of all devices at the stationary system location for a minimum of 120 minutes (stationary system (HD thermal imaging camera + HD day/night camera + Pan/Tilt), switch, Radio equipment, WDR Bullet IP camera).  To support 120 minutes of work it is accepted external battery packs for extended runtime |  |  |  |
| 18.10 | UPS should have Network port to connect the UPS to the network for remote monitoring and management |  |  |  |
| 18.11 | UPS must be delivered with rack mounting brackets, rack mounting hardware, rack mounting support rails, temperature probe and Web/SNMP management card. |  |  |  |
| **19.** | **UPS - Uninterruptible power supply device – free-standing**  **Quantity: 2** | Enter the manufacturers name and model: |  |  |
| 19.1 | Output capacity: Minimum 4500 W / 5000 VA |  |  |  |
| 19.2 | UPS on-line technology or Line Interactive Automatic Voltage Regulator (AVR) |  |  |  |
| 19.3 | Input voltage - Nominal input voltage 230V input frequency 50/60 Hz +/- 10% (automatic detection)  Possible variations of the input voltage (adjustability of the input voltage): Minimum range 160 – 270V or higher |  |  |  |
| 19.4 | Output voltage - nominal output voltage: 230V frequency 50/60 Hz +/- 3 Hz  Harmonic Distortion: maximum 2% |  |  |  |
| 19.5 | Output connectors - minimum 4 x IEC 320 C13 |  |  |  |
| 19.6 | The operating temperature of the device is minimally in the range from 0°C to 40°C |  |  |  |
| 19.7 | Additional accessories   * Power extension strip (minimum 1 meter of cable) with a minimum of 7 connection points and the possibility of connecting to the UPS output |  |  |  |
| 19.8 | The UPS must have battery capacity to support the operation of all devices at the LCC location for a minimum of 60 minutes (PC, 3 x monitor 23,5”, LCD screen 65").  To support 60 minutes of work it is accepted external battery packs for extended runtime |  |  |  |
| 19.9 | UPS should have Network port to connect the UPS to the network for remote monitoring and management |  |  |  |
| **20.** | **WEB relay**  **Quantity: 5** | Enter the manufacturers name and model: |  |  |
| 20.1 | Electric relay with built-in web server |  |  |  |
| 20.2 | Functionality - Remote switching on and off of the power supply, reset, via IP network and web server |  |  |  |
| 20.3 | INTERFACE   * Network connection minimum 1xRJ45, 10/100 Base-T Ethernet Port * Connections for output of relay contacts minimum 4 pcs SPDT * Connection for power supply device |  |  |  |
| 20.4 | RELAY CONTACTS   * number of relays - minimum 4 pcs * contact type – SPDT or SPST * maximum contact voltage – 240 VAC, 30 VDC * maximum contact current – min 12 A * contact resistance - < 30 milliohms |  |  |  |
| 20.5 | NETWORK PROTOCOL- Minimum HTTP, XML, TCP/IP |  |  |  |
| 20.6 | POWER SUPPLY - The AC/DC adapter for powering the device is an integral part of the kit with appropriate connections for AC and DC side |  |  |  |
| 20.7 | WORK CONDITIONS:  Ambient temperature minimum from -20°C to 50°C |  |  |  |
| 20.8 | METHOD OF INSTALLATION   * on the DIN rail * on the wall |  |  |  |
| **21.** | **Communication cabinet 15U external Quantity: 5** | Enter the manufacturers name and model: |  |  |
| 21.1 | Of a robust construction made of rolled and welded cold-rolled stainless steel sheet or stainless steel ) stainless steel sheet with grounding points that are connected to the cabinet body. |  |  |  |
| 21.2 | The dimensions of the waterproof cabinet for outdoor installation must allow the installation of all equipment for the location where it is installed: router, radio links, UPS, one voltage strip with 7 sockets , surge protection, fuses and other equipment necessary for the operation of the location. Cabinet dimensions minimum to accommodate equipment in height 15U. |  |  |  |
| 21.3 | The degree of protection of the cabinet is at least IP55 |  |  |  |
| 21.4 | Impact resistance minimum IK10 according to lEC 62262 or EN 62262 or SRPS EN 62262 (Degrees of protection for electrical equipment provided by housings against external mechanical impacts - IK code ) or equivalent |  |  |  |
| 21.5 | The finish of the cabinet must be structural powder coating, which ensures high resistance to weathering, or stainless steel sheet or equivalent. |  |  |  |
| 21.6 | The thickness of the housing sheet is at least 1.35 mm |  |  |  |
| 21.7 | Cabinet doors are mounted on at least two hinges. |  |  |  |
| 21.8 | Door opening angle: minimum 120°. |  |  |  |
| 21.9 | When the door is closed, the hinges are hidden. The door opening direction should be agreed with the customer during installation. |  |  |  |
| 21.10 | There must be a polyurethane seal or an equivalent seal around the entire perimeter of the door that provides a high degree of protection. |  |  |  |
| 21.11 | The door must be locked in at least two points. |  |  |  |
| 21.12 | The cabinet must be delivered with a lock and half cylinder and a minimum of 3 keys |  |  |  |
| 21.13 | The cabinet must be supplied with a humidity/temperature regulator (Hygrostat) that manages the heating and cooling of the cabinet in cases where the relative humidity exceeds the value set on the device. This prevents the retention of relative humidity above the dew point and condensation. In this way, the built-in components and the cabinet itself are protected. This device combines the functions of a thermostat and a hygrostat in one housing and at the same time independently monitors the relative humidity and temperature inside the closet. |  |  |  |
| 21.14 | The cabinet should be delivered with an air conditioning unit and must have a programmable thermostat. The air conditioning unit must be designed for external installation with a minimum cooling power > 850W. The air conditioning unit is mounted on the side of the cabinet, which must be prepared for the air conditioning unit at the factory, according to the previous agreement with the customer. IP protection of the air conditioning unit, minimum IP55.  Operating ambient temperature for the air conditioning unit minimum -15 °C to +50 °  The air conditioning unit must be equipped with fans with a minimum air flow of 500m3/h. |  |  |  |
| 21.15 | The cabinet must be supplied with a heater in combination with a thermostat and a hygrostat and serves to avoid too low or too high temperatures and high levels of air humidity in the cabinet, with a power of at least 10W. |  |  |  |
| 21.16 | The cabinet must be delivered with a built-in lamp that will illuminate the inside of the cabinet in case of work on the cabinet at night, with a light source power of at least 10 W. |  |  |  |
| 21.17 | The cabinet must be supplied with an additional roof with a slight slope for additional protection of the cabinet from rain, made of sheet steel or aluminium alloy |  |  |  |
| 21.18 | The cabinet must be supplied with a minimum of eight /8/ waterproof cable glands, minimum IP 65 |  |  |  |
| 21.19 | The cabinet must be supplied with overvoltage protection - a device for protection against atmospheric discharges and their consequences - lightning and overvoltage arrester |  |  |  |
| 21.20 | The cabinet must be supplied with an automatic power fuse inside the cabinet (16A, characteristic C) |  |  |  |
| 21.21 | The cabinet must be delivered with a minimum of one /1/ power strip , 7 x shuko with overvoltage protection |  |  |  |
| **22.** | **Column height of 5m**  **Quantity: 5** | Enter the manufacturers name and model: |  |  |
| 22.1 | Material: galvanized steel or stainless steel |  |  |  |
| 22.2 | Height: 5 m (± 10 cm) |  |  |  |
| 22.3 | Diameter: minimum 6 cm |  |  |  |
| **23.** | **Wire panel fence**  **Quantity: 5** | Enter the manufacturers name and model: |  |  |
| 23.1 | A solid wire panel fence with a minimum height of 2 meters and a wire thickness of at least 5 mm |  |  |  |
| 23.2 | Panels and posts must be protected by hot-dip galvanizing and then plasticized for additional corrosion protection |  |  |  |
| 23.3 | The fence must have one double gate with the drop bolt and gate lock solution with a total width of at least 4 meters so that the vehicle can reach the post. The chain and padlock solution is acceptable for lock solution. |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ADDITIONAL REQUIREMENTS** | | | | |
| **All items** | **Documentation with supplied equipment**  Documentation includes user instructions, necessarily in Serbian, and for equipment and original manufacturer's documentation in Serbian or English (instructions for handling, assembly, adjusting device settings and servicing).  The tender technical documentation that the tenderer must submit together with the tender documentation includes the manufacturer's documentation that contains all the technical data to prove the compliance of the offered product with the technical requirements.  Contractor must, upon completion of the work, prepare and deliver as-built technical documentation. |  |  |  |
| **All items** | **Requirements for Training** Training courses shall be conducted on the equipment that will be delivered. All participants shall receive the documentation in native language in a book and electronic version.Training Location: Training for operators will be conducted at the place of LCC and RCCTraining Participants: There shall be trained: minimum 6 operators per each locations.Training Duration: The timeline for the training shall be not shorter than 2 calendar days.Training Timing: Training schedules shall be agreed with User.Training Language: native |  |  |  |
| **All items** | **Transportability and Delivery Requirements** Delivery of the all equipment’s shall be the responsibility of the Contractor, who shall assume all risks and costs associated with transportation, storage and safety of the all equipment’s until the acceptance by the UserPackaging of the equipment to be supplied shall be to standards currently acceptable within the European Union Member States and shall provide full protection against damage for transport by whatever means chosen by the Contractor.The delivery of the equipment’s shall be on locations in line with document "SYSTEM DESIGN"  * The delivery can be in batches for every locations separately. |  |  |  |
| **All items** | **Warranty**  Warranty period 365 days from the issuance of PAC (Provisional Acceptance Certificate) in accordance with article 32 SC and GC of the Contract. Offer must include warranty service description including:   * Service organisation contact data including name, postal address, telephone number, fax number and e-mail address; * Guaranteed that any requests for services will be attended to within 48 hours; * Guarantee that all items can be repaired or alternatively replaced within a maximum of 7 days; * Letter of confirmation that genuine spare parts and consumables will be available for a period of minimum 3 years from the date of final acceptance of the equipment. |  |  |  |
| **All items** | **Commercial warranty**  365 days from the issuance of FAC (Final Acceptance Certificate) in accordance with the conditions laid down in Article 32 of the General Conditions and Article 32 of the Special Conditions.  Detailed description of the organisation of the proposed service and description of the Manufacturer’s commercial warranty shall be included in the offer. |  |  |  |
| **1., 4. and Microwave radio link (10. , 11a. , 11b. , 12. , 13. , 14. , 15. and 16.)** | **Authorization**  Manufacturer's Authorization for installation and commissioning of the specified equipment. As evidence, it is required to submit certificate(s) of professional training issued by the manufacturer of the equipment or its authorized representative, confirming that the bidder is qualified and has engaged or employed staff to perform installation and commissioning of the equipment. |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Item / Location of installation** | Location "Vrbica" | Location  "Srpska Crnja" | Location  "Jaša Tomić" | Location  "Veliki Gaj" | Location  "Kusić" | Location  Bela Crkva | Location  Vršački Breg | Location Krajišnik | Location  Kikinda 2 | PU Kikinda | RCGP Vršac (RKC) | SGP  Veliko Gradište | MUP, Kneza Miloša 101, Belgrade | **In total** |
| 1. | Medium-range stationary system (thermal imaging camera - day/night camera) | 1 | 1 | 1 | 1 | 1 |  |  |  |  |  |  |  |  | **5** |
| 2. | Telecommunication pole 24 m | 1 | 1 | 1 | 1 | 1 |  |  |  |  |  |  |  |  | **5** |
| 3. | WDR Bullet IP camera | 4 | 4 | 4 | 4 | 4 |  |  |  |  |  |  |  |  | **20** |
| 4. | Central video server and video management software (VMS) |  |  |  |  |  |  |  |  |  |  |  |  | 1 | **1** |
| 5. | Camera monitoring workstation for monitoring and managing cameras with support for simultaneous operation |  |  |  |  |  |  |  |  |  |  | 1 | 1 |  | **2** |
| 6. | Monitor minimum 23.5" LCD LED |  |  |  |  |  |  |  |  |  |  | 3 | 3 |  | **6** |
| 7. | LCD screen minimum 65" |  |  |  |  |  |  |  |  |  |  | 1 | 1 |  | **2** |
| 8. | Work table for LCC and RCC |  |  |  |  |  |  |  |  |  |  | 1 | 1 |  | **2** |
| 9. | Work chairs for LCC and RCC |  |  |  |  |  |  |  |  |  |  | 2 | 2 |  | **4** |
| 10. | Microwave radio equipment - Split-mount edge node - indoor unit | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 1 | 1 |  | 2 | **13+2** |
| 11a. | Microwave radio equipment - Split-mount outdoor unit (14641-14725 MHz) – TX Low | 1 | 1 |  | 2 |  | 2 |  | 1 |  | 1 | 1 |  | 2 | **9+2** |
| 11b | Microwave radio equipment - Split-mount outdoor unit (15061-15145 MHz) – TX High |  |  | 2 |  | 1 |  | 3 |  | 3 |  |  |  | 2 | **9+2** |
| 12. | Microwave antenna 0.3m (14620-15230 MHz) |  |  |  |  |  | 1 | 1 |  | 1 | 1 | 1 |  | 1 | **5+1** |
| 13. | Microwave antenna 0.6m (14620-15230 MHz) | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 1 | 2 |  |  |  | 1 | **13+1** |
| 14. | Capacity License 100Mbps for Microwave radio equipment | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 2 | 4 | 2 | 2 |  | 2 | **26+2** |
| 15. | 2nd Modem Activation (license) for Microwave radio equipment | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 1 | 1 |  | 2 | **13+2** |
| 16. | Switching Activation (license) for Microwave radio equipment | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 1 | 1 |  | 2 | **13+2** |
| 17. | Network switch | 1 | 1 | 1 | 1 | 1 |  |  |  |  |  |  |  |  | **5** |
| 18. | UPS - Uninterruptible power supply device - 19" rack variant | 1 | 1 | 1 | 1 | 1 |  |  |  |  |  |  |  |  | **5** |
| 19. | UPS - Uninterruptible power supply device – free-standing |  |  |  |  |  |  |  |  |  |  | 1 | 1 |  | **2** |
| 20. | WEB relay | 1 | 1 | 1 | 1 | 1 |  |  |  |  |  |  |  |  | **5** |
| 21. | Communication cabinet 15U external | 1 | 1 | 1 | 1 | 1 |  |  |  |  |  |  |  |  | **5** |
| 22. | Column height of 5m |  |  |  |  |  | 1 |  | 1 | 1 | 1 | 1 |  |  | **5** |
| 23. | Wire panel fence | 1 | 1 | 1 | 1 | 1 |  |  |  |  |  |  |  |  | **5** |