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

**Contract title:** **Public procurement of supplies for project REBIOFORESTS**

**Ref. number:** **HR-RS00062 – PP2 – TD02**

**LOT 2 - Drone for multispectral monitoring**

**Columns 1-2 should be completed by the Project partner**

**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 Project partner 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.

The requirements set out in the technical specifications represent the minimum technical characteristics which offered goods must satisfy, unless stated otherwise, and tenderers are not allowed to modify technical specification in any way.

For each item for which it is not explicitly stated that it is allowed to offer goods of the equal characteristics, i.e. for each item where it is not stated “or equivalent”, for the purposes of this tender documentation it is assumed that words “or equivalent” are stated, and tenderer is allowed to offer equivalent goods / goods of equivalent characteristics.

**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 registration of the completed vehicle in accordance with the relevant legal regulations in the Republic of Serbia. This includes the Certificate from the Agency for Traffic Safety confirming the vehicle examination, as well as the technical inspection registration sheet, which is required for further vehicle registration.

| **1.**  **Item Number** | **2.**  **Specifications Required** | **3.**  **Specifications Offered** | **4.**  **Notes, remarks,  ref to documentation** | **5.**  **Evaluation Committee’s decision (Y/N)** |
| --- | --- | --- | --- | --- |
| **1** | **Drone for multispectral monitoring**  **Quantity: 1 Unit**  **(Professional fixed-wing unmanned aerial vehicle (VTOL) with complete accompanying equipment for terrain mapping and vegetation)** |  |  |  |
|  | **Required technical characteristics:**  General:  - Fixed-wing aircraft with vertical take-off, landing and stationary maintenance in the air - VTOL (Vertical take-off and Landing)  - The possibility of fully autonomous or semi-autonomous flying and execution of the planned mission from take-off to landing.  - The aircraft is equipped with sensors for monitoring the complete state of the system and built-in intelligent systems in case of a safe forced landing  - The possibility of working without control points in the field  - Integrated high-precision GNSS receiver for determining the projection centers of photos.  - Compatibility with existing unmanned aerial systems  Technical characteristics of the drone:  - Fixed-wing unmanned aerial vehicle without the possibility of unfolding the wings due to the maximum robustness and reliability of the system  - The body of the aircraft is made of fiberglass for superior aerodynamics and stability in flight.  - Vertical take-off and landing from the tail - VTOL (Vertical take-off and Landing)  - Load capacity: 800 g or better.  - Maximum take-off weight: 4.5 kg or less  - Wingspan: maximum up to 125 cm for easier portability.  - Radio connection with the controller: 10 km or more.  - Possibility of integration of different types of cameras and their quick replacement in the field.  - Sensor protection provided by tail landing method.  - Batteries sufficient for 2 hours of effective flying in optimal conditions without recharging.  Technical characteristics of the RGB camera:  - RGB camera  - Sensor type: full-frame  - Sensor resolution: 61 MP or more  - Lens: 24 mm – small distortions  - The best achievable resolution when flying at a height of 45 m above the ground: 0.7 cm/px  Technical characteristics of the multispectral camera:  - Multispectral camera  - Sensor type: 5 individual sensors (Red, Green, Blue, Rededge, Near-infrared) and panchromatic sensor  - Lens: 5,5 mm for multispectral sensors and 10.3 mm for panchromatic sensor  - The best achievable resolution when flying at a height of 60 m above the ground: 2 cm/px  Operational characteristics of the drone:  - Declared flight time in optimal conditions with one set of batteries and specified camera: 54 minutes or better.  - Wind resistance: up to 12 m/s during flight and 8 m/s during takeoff and landing  - Area required for take-off and landing operations: 2 m x 2 m  - Tested and guaranteed operating temperature range: -10° C to 40° C  - Accuracy of fully autonomous landing at the initial location: < 2 m  - Maximum flying height: 5000m above sea level.  Flight Planning Software:  - From the same manufacturer as the aircraft  - Android oriented and available on a portable tablet that is part of the set  - Windows oriented for computer flight planning  - The possibility of a fully autonomous planned mission  - Pausing and resuming the mission at any time  - Ability to plan and acquire data on multiple training grounds within one mission.  - Manual control of the system during landing using available software controls on the tablet  - Corridor mapping option  - Terrain tracking option  - Option to load your own terrain model for flight planning  - Safety checklist  - Loading the KML file  - The possibility of using maps for flight planning and data acquisition without an available internet connection in the field  - Option of vertical and horizontal geofencing  - Smart autonomous homing that takes into account the terrain model  Recording results:  For RGB camera  - Declared area photographed during one flight with an achieved spatial resolution of 2 cm/px and 60% side overlap between photographs: 280 ha or better  - Declared data accuracy with built-in PPK GNSS module, without control points (GCP): Absolute accuracy (RMS) - horizontal: 1 cm  - vertical: 3 cm  For multispectral camera  - Declared area photographed during one flight with an achieved spatial resolution of 4 cm/px and 70% side overlap between photographs: 150 ha or better  - Declared data accuracy with built-in PPK GNSS module, without control points (GCP): Absolute accuracy (RMS) - horizontal: 3 cm  - vertical: 5 cm  Warranty and maintenance   * Second year warranty * Total maintenace plan for third year, this plan can be extended for the forth year   Additional Equipment   * Additional battery sets, 4 sets of two batteries each * Field Battery Charger * Hard Transport Case   Training for the use of the unmanned system:  The supplier is obliged to carry out free professional office and field training for a duration of 5 days, which includes the following:  - Acquaintance of future operators with basic aviation regulations.  - Theoretical training and basics of working with an unmanned system.  - Practical training for system management and execution of the planned mission  - Free permanent support and consultations in further work for operators of the unmanned system |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **All items** | **Delivery** of all items to following address: “Forest Estate” Sremska Mitrovica, Parobrodska 2, Sremska Mitrovica, Republic of Serbia. |  |  |  |
| **All items** | **Testing** of all basic functions of the instrument on a set of producers standard samples commonly used for the corresponding instrument.  Installed equipment must be tested as system, compatible with existing system. |  |  |  |
| **All items** | Technical documentation for equipment (Operating manuals/ Users Guide/ Equipment operating instructions/ Cleaning procedures/ Maintenance procedures/ Calibration procedures) upon delivery. |  |  |  |
| **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 33 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. |  |  |  |

**<Signature of authorised representative of the legal entity >**

**< Name and position of authorised representative of the legal entity >**

**< Date >**