



TECHNICAL SPECIFICATIONS

I. TITLE:

Supply and Delivery of Various Technical and Scientific Equipment for Special Engineering Programs and Projects Division

II. OBJECTIVE:

1. Procure various Technical and Scientific Equipment to ensure precise measurements and accurate project site data for road monitoring and planning.
2. Invest in training tools and equipment to build the technical capacity of engineers, technicians, and local workers involved in the Farm-to-Market Road projects.

III. APPROVED BUDGET FOR THE CONTRACT (ABC):

The Approved Budget for the Contract is One Million Five Hundred Twenty-One Thousand Six Hundred Pesos (Php 1,886,600.00) inclusive of all taxes, testing, and delivery charges.

IV. TECHNICAL SPECIFICATIONS

| Lot | Technical and Scientific Equipment | Qty | Unit cost | Total Cost |
|-----|---|-----|------------|------------|
| 1 | <p>SET OF MODERN LAND SURVEYING AND POST PROCESSING TOOL AND EQUIPMENT</p> <p><u>SET Base + Rover w/ External Radio</u></p> <ul style="list-style-type: none"> • Brand New • Internal Radio Coverage: at least 3 kilometers • Internal Radio Number of Channels: at least 1,250 channels, with GPS receiver (GLONASS, Galileo, Beidou, QZSS, SBAS, IRNSS, or newer GPS) • Dust and Water Protection: at least IP 68 • With compatible Built-In Batteries (at least 7000 mA) • With NFC Function • Controller Range from Receiver: at least 12m • Material: Magnesium Alloy Body and lightweight and resistant to magnetic interference. • External Radio range: at least 12 km. distance <ul style="list-style-type: none"> • With free installed software and support through a firmware upgrade. • Interoperable with any Android phone as a controller | 1 | 750,000.00 | 750,000.00 |

- Memory: At least 64 GB Memory
- At least 1 Year Warranty
- Display: LCD or better display with necessary protection

Controller Specifications

- Touchscreen: At least 5.5-inch sunlight readable HD touchscreen
- Processor: At least Octa-core 2.0 GHz processor
- Operating System: at least Android 8.1 Operating system
- Memory: At least 4GB RAM + 64 GB ROM
- Camera: At least 5MP front camera and 13MP rear camera
- Dust and Water Protection: IP67 certified grade
- Battery: at least 7000mAh battery
- With Wi-Fi, Bluetooth, NFC,4G
- Port: at least USB Type-C or latest port technology

Additional Technical Specifications:

- Static and fast static (RMS)
 - Horizontal 3 mm + 0.5 ppm
 - Vertical 5 mm + 0.5 ppm
- Real-Time kinematic (RMS)
 - Horizontal 8 mm + 1 ppm
 - Vertical 15mm + 1 ppm
- Initialization time: < 5 s
- Initialization reliability: > 99.9%

Accessories Base Station:

With 1-V1t GNSS RECEIVER
 With 1-PD Charger adapter
 With 1-Charger joint-UK
 With 1-Charger joint-EU
 With 1-Type C cable for receiver
 With 1-UHF radio antenna
 With 1-Extension Rod
 With 1-Tribrach aluminum sheet
 With 1-Survey Benchmark
 With 1-Antenna connector
 With 1-TRIBRACH
 With Quick Start Guide
 With 1- EPP BOX
 With 1- Warranty Card
 With 1-User Manual

Accessories Rover:

With 1-V10i GNSS Receiver
 With 1-PD Charger-Adapter
 With 1-Charger joint-UK



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| | <p>With 1-Charger joint-EU With 1-Type C cable for receiver With 1-UHF radio antenna With 1-Field Controller E600 With 1-USB-A to Type C cable for controller With 1-Charger for field Controller (UK/US/EU) With 1-Field Controller Wrist strap With 1-Field controller bracket With 1-ABS Box With 1-Warranty Card With 1-User Manual</p> <p>External Radio List: With 1-External Radio (400m) With 1-External Radio Antenna With 1-External Radio cables With 1-External Radio Power cable With 1-Outer Carton With 1-Inner lining material</p> <p>At least 1 year Warranty</p> <p>Training: At least 2 days of basic training/seminar on the Operation and Maintenance of RTK</p> | | | |
| SUBTOTAL | | | | 750,000.00 |
| 2 | <p><u>DRONE CAMERA</u></p> <ul style="list-style-type: none"> • Weight: at most 1kg / 2.2 lb • Maximum Flight Time: At least 32 minutes • Maximum Horizontal Speed: At least 17 m/s • Maximum Vertical Speed: At least 4 m/s • Maximum Propeller Speed: At least 10,000 rpm • Service ceiling: at least 5,000 m (above sea level) • Dust and Water Protection: at least IP53 • Noise emission at 1 m (3 ft): at least 81 dB • With MicroSD and SIM card slots <p><u>Connectivity</u></p> <ul style="list-style-type: none"> • With Seamless 4G/WiFi switching • Flies Beyond Visual Line of Sight • Video Quality: at least 1080p at 30 fps • With live streaming capability • No interference near telecom towers <p><u>Sensors</u></p> <ul style="list-style-type: none"> • With GPS receiver (GLONASS, Galileo, or newer GPS) • With Vertical camera & Time of Flight • With Barometer and magnetometer | 2 | 380,000.00 | 760,000.00 |



- With 2 x 6-axis inertial units (flight and camera)
- With 2 x 3-axis accelerometers
- With 2 x 3-axis gyroscopes
- With Stereoscopic cameras mounted on a 311° rotating gimbal (-107° to +204°) for obstacle avoidance
- With an AI trajectory optimization system

Controller

- Weight: at most 750 g
- Transmission system: at least WiFi 802.11a/b/g/n & 4G or better transmission technology
- Direct video stream resolution: at least 1080p
- Battery capacity: at least 3,000 mAh
- Charges smartphones and tablets
- Ports: at least 2xUSB-C, micro-HDMI
- Dust and Water Protection: at least IP5X resistant
- Compatible with all smartphones and tablets
- Must include dedicated smartphone device:
 - Size: up to 8 inches
 - Internal Storage: 128 GB
 - at least 6 GB RAM

Smart Battery

- Type: at least High density LiPo or better battery type
- Battery Capacity: at least 6,500 mAh 4.4 V
- Charging port: at least USB-C or better port technology
- Maximum charging power: at least 45 W

Application

- no subscription fee
- Available on the App Store
- Compatible with iOS 12 and higher
- 3 free 3D models, courtesy of Pix4Dcloud

Imaging System

- Sensor: at least 1/2" 48 MP CMOS
- Dynamic range: at 14 EV in HDR mode
- Optical LD-ASPH (low dispersion aspheric lens):
 - Aperture: f/2.0
 - 35mm focal equivalent: 24 mm
 - Depth of field: 4.5 m to ∞
- maximum ISO: 6400
- Shutter speed: 1 s to 1/10,000 s
- Zoom: 6x – lossless: up to 4x(1080p) & 2x (4K UHD)
- 6-axis stabilization:
 - Mechanical: 3-axis (pitch, roll, yaw)
 - Electronic (EIS): 3-axis (pitch, roll, yaw)
- Gimbal tilt range: -90° to +90°

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| | <p><u>Video Specification</u></p> <ul style="list-style-type: none"> • Format: at least MP4 (H.264, H.265) • Resolutions: <ul style="list-style-type: none"> - 4K UHD: 3840x2160 - 1080p: 1920x1080 • Framerates: <ul style="list-style-type: none"> - 4K UHD: 24/25/30 fps - 1080p: 24/25/30/48/50/60 fps - HDR 10: 4K UHD/1080p - 24/25/30 fps - HDR 8: 4K UHD/1080p - 24/25/30 fps • Horizontal field of view (HFOV): 68° • Maximum video bandwidth: 200 Mbps • P-log for professional video editing <p><u>Photo Specifications</u></p> <ul style="list-style-type: none"> • Formats: at least JPEG, DNG (Digital NeGative RAW) or better format • Resolution: at least 48 MP (@ 8000x6000), at least 12 MP (@ 4000x3000) • Horizontal field of view (HFOV): at least 70° (Wide), At least 65° (Wide with EIS), at least 60° (Rectilinear with EIS) • With the following modes: Single, Bracketing, Burst (10 fps), • Panorama (4 formats), Time-lapse, GPS-lapse <p>At least 1 year Warranty</p> <p>Training: At least 2 days of basic training/seminar on the Operation and Maintenance of Dron</p> | | | |
| SUBTOTAL | | | | 760,000.00 |
| 3 | <p>Laser Meter</p> <ul style="list-style-type: none"> • maximum Measuring Distance: at least 100m • Accuracy: at most ±2mm • Measuring Speed: at most 0.5 sec. • Laser type: at least Class 2, 635nm, <1mW • With compatible rechargeable batteries (at least 3000mAh) plus at least four (4) spare rechargeable batteries • With battery charger compatible with batteries • Dust and Water Protection: at least IP54 • History memory: at least 10 memory entry • Display: LCD or better display with necessary protection • Compliant with the latest applicable standards • with a manual and compatible carrying pouch <p>At least 1 year Warranty</p> | 5 | 18,000.00 | 90,000.00 |

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| <p>Measuring Wheel</p> <ul style="list-style-type: none"> • Maximum Measuring Distance: at least 99999.9 m/ft • Accuracy: at most $\pm 1.0\%$ • Display Resolution: at most 0.1m • Display: LCD or better display with backlight • With memory function • With retractable aluminum handle. Easy to carry • Wheel Material: at least Flexible and durable ABS with TPR thick tire • With starting point arrow and kickstand supports • With compatible rechargeable batteries plus at least two (2) spare rechargeable batteries • Ideal for asphalt, concrete, boardwalk, gravel, dirt, and lawn <p>At least 1 year Warranty</p> | 4 | 10,000.00 | 40,000.00 |
| <p>Range Finder</p> <ul style="list-style-type: none"> • Maximum distance: at least 400 meters • Accuracy: at most ± 50 cm • Dust and Water Protection: at least IP X7 • Magnification: at least 5x • with compatible rechargeable batteries plus at least two (2) spare rechargeable batteries • with battery charger compatible with batteries • with a manual and compatible hard waterproof padded plastic protective case <p>At least 1 year Warranty</p> | 4 | 38,000.00 | 152,000.00 |
| <p>Vernier Caliper</p> <ul style="list-style-type: none"> • Maximum Measuring length: at least 100mm • Resolution: at least 0.02mm • Dust and Water Protection: at least IP 54 • Material: Carbon Steel or Better Material • Display: LCD or better display with necessary protection • with thumbwheel and metric/inch system conversion at any position • with compatible rechargeable batteries plus at least ten (10) spare rechargeable batteries • with manual and compatible hard waterproof padded plastic protective case <p>At least 1 year Warranty</p> | 11 | 1,000.00 | 11,000.00 |
| <p>Two-Way Radio</p> <ul style="list-style-type: none"> • Frequency Range: Ultra High Frequency -350-500MHz, Very High Frequency -130-180 MHz • No. of channels: at least 12 programmable channels • Dust and Water Protection: at least IP54 | 4 | 20,000.00 | 80,000.00 |



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|---|----|--------|---------------------|
| <ul style="list-style-type: none"> • with compatible rechargeable batteries plus at least one (1) spare rechargeable battery • with battery charger compatible with batteries • with a manual, antenna, power adapter, nylon hand strap, and compatible carrying pouch <p>At least 1 year Warranty</p> | | | |
| <p>Level</p> <ul style="list-style-type: none"> • Size: at least 8” • Material: ABS or better material • with a magnetic base • with 3 vials – Horizontal, Plumb, and 45 degrees <p>At least 1 year Warranty</p> | 12 | 300.00 | 3,600.00 |
| SUBTOTAL | | | 376,600.00 |
| GRAND TOTAL | | | 1,886,600.00 |

V. TERMS AND CONDITIONS

1. The delivery and acceptance including demonstration/testing is within 60 calendar days upon the receipt of Notice to Proceed;
2. Freight-on-Board (FOB) Destination. The supplier will shoulder the delivery expense to the drop-off point;
3. Delivery point is at The Bureau of Agricultural and Fisheries Engineering (BAFE) at, 3rd Floor, Sugar Regulatory Administration Building (SRA) Main Building.
4. The technical representative of the supplier shall be the one to unpack the package after the delivery to the drop-off point and test for the functionality of the equipment;
5. The technical representative of the supplier shall be the one assemble, adjust and provide training on the actual use and operation of Set of Modern Land Surveying and Post-processing tools. The training materials/inputs/medium to be used in the training and testing of functionality shall be provided by the supplier at no cost;
6. The training will be conducted prior to the acceptance of the equipment upon the availability of the end-user.
7. Certificate of undertaking of the training shall be provided by the technical representative of the supplier.
8. The supplier must provide after-sales invoice within 72 hours.
9. The supplier must have at least two (2) years' experience.

VI. INSPECTION & ACCEPTANCE

1. After sales service and support during the warranty period, all reported defects shall be completely/satisfactorily repaired/replaced by the winning bidder/supplier within 72 hours after a receipt of verbal and/or written notice from the procuring entity.
2. The Procuring Entity shall have the right to reject and return the unit and cancel the corresponding Contract if units delivered are defective, incomplete or non-compliant to the specifications herein specified.



VII. PAYMENT

The payment shall be done within thirty (30) working days upon receipt, inspection and acceptance of the various Technical and Scientific Equipment including documents such as sales invoice and warranty documents.

Prepared by:



ENGR. CHRISTIAN D. MANALANG
End User, SEPPD

SAMPLE IMAGES

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|--|---|
| <p>SET OF MODERN LAND SURVEYING AND POST PROCESSING TOOL AND EQUIPMENT</p> |  |
| <p>DRONE CAMERA</p> |  |
| <p>LASER MEASURER</p> |  |
| <p>MEASURING WHEEL</p> |  <p style="text-align: center;">* * *</p> |
| <p>RANGE FINDER</p> |  |
| <p>VERNIER CALIPER</p> |  |
| <p>TWO-WAY RADIO</p> |  |
| <p>LEVEL</p> |  |