

# GNSS Base Station/Rover System

## 1. SCOPE

- 1.1. The State will perform the purchase of the portable GNSS base/rover systems as follows:
  - 1.1.1. Purchase new Topcon GR-5 Portable GNSS Receivers (Survey Grade)
- 1.2. Field Equipment and Peripherals
  - 1.2.1. Portable Rover Accessory Pack
  - 1.2.2. Portable Base Accessory Pack

## 2. PROSPECTIVE BIDDERS

- 2.1. Manufacturers bidding on this invitation to bid shall provide “off-the-shelf” software solutions for data collection, post processing and network management software. If the software products bid in this contract are third party software products, the State of Tennessee will contact the awarded bidder only with issues, problems, etc., and not the third party software vendor. All software products being bid shall not be beta but officially released products. It is the responsibility of the awarded vendor to resolve any and all issues concerning the “off the shelf” software solutions for the State of Tennessee.
- 2.2. Manufacturers bidding on this invitation to bid, shall provide “off-the-shelf” hardware solutions for portable GNSS rovers, portable GNSS base stations, and permanently installed GNSS reference stations, and associated peripherals. If the hardware products bid in this contract are third party hardware products, the State of Tennessee will contact the awarded bidder only with issues, problems, etc., and not the third party hardware vendor. It is the responsibility of the awarded vendor to resolve any and all issues concerning the “off-the-shelf” hardware solutions for the State of Tennessee.
- 2.3. There will be one point of contact to resolve any issues that arise from the contents of this bid, i.e., hardware, software, functionality, etc., and that will be the awarded bidder only, and not third party vendors. If the problems that arise are a result of third party vendor products, then the awarded vendor will resolve those issues for the State of Tennessee.
- 2.4. The State of Tennessee has the option to obtain, at no additional charge,

hardware and software upgrades or new product lines that upgrade the functionality of requested products, to any portion of this bid package for 180 calendar days from the bid opening, should the awarded vendor or the awarded vendor's manufacturer release any new or updated hardware and software products which are publicly released and commercially available within 180 days of the bid opening. The vendor shall provide a replacement hardware or software product that meets or exceeds the specifications of original hardware or software product for any hardware or software that is discontinued for the life of the contract.

- 2.5. The awarded vendor is responsible for oversight of all repairs, and said vendor must be authorized by the manufacturer to perform both Warranty and Non-Warranty repairs. All repairs will be performed by technicians authorized to perform both Warranty and Non-Warranty repairs.

### **3. Hardware Technical Requirements**

#### 3.1.1. GNSS Receivers

##### 3.1.2. Portable GNSS Rover and/or Base Receiver

3.1.2.1. Topcon GR-5 Receiver Kit will include the following:

- 3.1.2.1.1. GR-5
- 3.1.2.1.2. Internal UHF radio for transmit and receiving
- 3.1.2.1.3. (2) Batteries
- 3.1.2.1.4. Charging Cables
- 3.1.2.1.5. Power Supply
- 3.1.2.1.6. Serial DB9 Cable
- 3.1.2.1.7. USB Cable
- 3.1.2.1.8. (2) UHF Antennas
- 3.1.2.1.9. Configuration file
- 3.1.2.1.10. 2M, Composite Snap Lock Pole for GR-5
- 3.1.2.1.11. Case
- 3.1.2.1.12. Documentation
- 3.1.2.1.13. OAF GR-5 GLONASS L1,L2

3.1.3. All receivers shall have the ability to receive L1, L2, L2C and L5 signals, or the equipment will be upgraded, at no charge to the State within 30 days of when the vendor's equipment is able to receive the L2C and L5 signals. In addition, the receivers will have the ability to receive the US GNSS system of satellites, the Glonass system of satellites, and the Galileo system of satellites, or shall be upgraded at no charge to the State when the manufacturer's equipment is capable of receiving the additional satellite

signals from the Glonass system and the Galileo system.

3.2. Topcon GR-5 GNSS Rover Accessory Kit

- 3.2.1. GR-5 Battery Recharger Cable
- 3.2.2. AA Battery Holder for GR-5
- 3.2.3. GR-5 Quick Disconnect
- 3.2.4. Rover Rod Bipod
- 3.2.5. 2M, Composite Snap Lock Pole for GR-5

3.3. Topcon GR-5 GNSS Base Accessory Kit

- 3.3.1. GR-5 Battery Recharger Cable
- 3.3.2. AA Battery Holder for GR-5
- 3.3.3. GR-5 Quick Disconnect
- 3.3.4. Cable, Power, Cradle to Receiver
- 3.3.5. Tripod, GR-5, HD Fixed Height with Bag
- 3.3.6. Rover Rod Bipod
- 3.3.7. 2M, Composite Snap Lock Pole for GR-5

**4. General Portable Base/Rover System Requirements**

- 4.1. All portable Base/Rover Receivers will include an Internal modem and any necessary modem accessories will be provided as a part of this bid. The cost for the internal modem will be included in the overall bid price for the portable Base/Rover Receivers. Wireless service for the modem will be provided by the State of Tennessee and the wireless carrier will be made known to the vendor at the time of purchase, so modem receiver configuration can be completed.
- 4.2. Communications via Bluetooth technology and by cable, or equivalent, between the all components is required.
- 4.3. All applications for the broadcast radio FCC licenses shall be completed by the vendor and forwarded to the State of Tennessee for signatures. Completed applications shall be included with the delivery of each radio.
- 4.4. All components of the field survey system shall be constructed to withstand the environment common to field surveying.
- 4.5. All serialized items shall be housed in a carrying case. If this carrying case cannot be used as a shipping container, shipping containers will provided in addition to the carrying case.
- 4.6. The field system shall be battery operated. The battery or batteries shall provide not less than 8.0 hours of normal operation without recharge or without switching batteries. One spare battery for a minimum of 4.0 additional hours of operation

and one or more battery chargers, enough to charge all batteries supplied at the same time shall be supplied with the system. The batteries shall be replaced during operation without loss of data.

4.7. Communications via Bluetooth technology, cables and jacks, or equivalent, shall be provided for operation from a standard automobile battery. This communication ability shall operate a minimum of 10 m from the auto battery, utilizing Bluetooth technology, cable connection, or equivalent. If Bluetooth technology or equivalent can be utilized, then cables are not required.

#### 4.8. Antenna/Receiver Requirements

4.8.1. The antenna and the Receiver shall operate, via cable connection or Bluetooth technology, or equivalent, remote from the data collector/controller at distances up to 10 meters maximum. In addition the vendor shall provide all cables and/or wireless devices necessary for the State of Tennessee to perform Real-Time Kinematic missions in a more portable apparatus, utilizing either portable GNSS base stations or permanently mounted GNSS reference stations, and using the bid system in either portable GNSS Base or Portable GNSS Rover mode. One 10 meter cable for connecting the data collector/controller to the antenna/receiver shall be supplied by the vendor for each portable GNSS base and one 10 meter cable for connecting the data collector/controller to the antenna/receiver each portable GNSS rover, unless communications can be established at the 10 meter distances via Bluetooth technology or equivalent.

4.8.2. The antenna/receiver shall mount on a standard surveying tripod having a 5/8 inch by 11 threads per inch instrument fastener.

4.8.3. The vendor shall provide a means of measuring from a survey ground point to the antenna phase center and to the antenna reference point (ARP). Fixed height tripods/bipods and standard antenna calibrations are an accurate method of measurement.

### 5. GNSS Office Post - Processing Software Requirements

5.1. The GNSS office post-processing software shall meet or exceed the most current specifications of the current version of the Topcon Tools software available from the manufacturer at the time of delivery and will include all activated options within the software.

## 6. Warranty

- 6.1. The system, including equipment and software, shall be warranted against all defects in materials and workmanship. This warranty applies to all equipment and peripherals, such as radios, tripods, modems, etc. contained within this bid. The warranty shall cover all damages to the equipment and software, as a result of defects in materials and workmanship, and shall not cover abuse.
- 6.2. The warranty period shall begin upon final acceptance of the delivery by the State and shall be for a minimum duration of one year, or the manufacturer's standard warranty period, whichever is greater, from the final acceptance of the delivery.
- 6.3. During the warranty period, there will be two different options for repair/replacement of components. Those options are
  - 6.3.1. On-site emergency service. During the warranty period, there will be no compensation for On-site emergency service.
  - 6.3.2. Shipping of the equipment to the vendor.
    - 6.3.2.1. If the components are shipped, the items shall be shipped to and from the vendor's maintenance site by a one (1) day express delivery service. The awarded vendor shall pay the cost of shipping and shipping insurance to the vendor's maintenance site. The insurance rate shall be determined by the value established through this contract. The vendor shall pay the cost of returning the equipment (shipping and shipping insurance). The State reserves the right to transport the components directly to the repair facility instead of shipping them; however, if components are hand delivered, the State is required to pick up the items from the vendor after repair. The equipment shall be repaired and shipped to the State of Tennessee by the vendor within ten (10) working days of the receipt of the equipment. While the vendor is repairing or diagnosing a repair, the vendor shall provide loaner equipment, during the repair period, of equal or better specifications, at no additional cost to the State of Tennessee. The loaner equipment will be shipped to the State of Tennessee on the next day after the vendor receives the damaged unit in the mail, or by hand delivery.
- 6.4. Successful bidder shall provide technical support for all the hardware and the computer software bid, during normal working hours, defined as 7:30 AM CST to 5:00 PM CST M-F, excluding State holidays, by manufacturers authorized technical support staff, or equivalent. This support shall be in person on-site during normal working hours, as defined above, and additional 24 hour assistance shall be available via toll free number, and by internet web page. Bidding vendor's web address \_\_\_\_\_ and the toll -free phone number \_\_\_\_\_ shall be inserted in

the provided space above at the time of bid.

- 6.5. Network Software/ Reference Station Network Technical Support, GNSS Office Post Processing Software Technical Support, GIS Office Post Processing Software Technical Support, and any hardware technical support shall be provided at no cost to the State of Tennessee via phone, email, or website. On-Site Network Software/ Reference Station Network technical support, GNSS Office Post Processing Software Technical Support, and GIS Office Post Processing Software Technical Support will be supplied to previously trained State of Tennessee employees at no additional cost to the State of Tennessee during the Warranty period. Field Technical Support for Portable GNSS Rovers, Portable GNSS base stations, and Portable GIS/GNSS (Mapping-Grade) Receivers shall be provided to previously trained State of Tennessee employees at no additional cost to the State of Tennessee, during the Warranty period.
- 6.6. The awarded vendor is responsible for oversight of all repairs, and said vendor must be authorized by the manufacturer to perform both Warranty and Non-Warranty repairs. All repairs will be performed by technicians authorized to perform both Warranty and Non-Warranty repairs.

## **7. Manuals**

- 7.1. Technical and user manuals covering all of the items bid in this specification shall be included with the delivery. These manuals shall include at a minimum the following topics: system operation, user operation of system, and user maintenance of system.
- 7.2. One (1) set of field station manuals shall be supplied with each GNSS Receiver and controller.
- 7.3. One (1) set of office processing manuals shall be supplied for each set of software purchased. These manuals may either be paper copies or via electronic media through software help menus.

## **8. Delivery**

- 8.1. Delivery shall not be considered complete until purchased Permanently Installed Reference Stations, Portable GNSS Base Stations, Portable GNSS Rovers, GNSS Network Software, GNSS office processing software, and/or manuals have been received, installed by the State of Tennessee, fully operational, and approved by the State of Tennessee. Payment will be issued in phases as

purchase orders are processed and approved by the State of Tennessee staff. As the items of a purchase order are approved by State personnel, then payment will be rendered on those items.

- 8.2. Delivery of all equipment and software will be coordinated through the State agency placing the order, and delivered anywhere throughout the State of Tennessee as directed by the State of Tennessee.
- 8.3. Delivery shall be made within approximately thirty (30) days after receiving order.