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MAYOR

CITY OF BIRMINGHAM

FINANCE DEPARTMENT

PURCHASING DIVISION

P-100 CITY HALL
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October 17, 2016

J. THOMAS BARNETT, JR.
FINANCE DIRECTOR

RON NICKEL
PURCHASING AGENT

WILLIAM E. CAFFEE
ASSISTANT PURCHASING AGENT

INVITATION TO BID #16-61

Sealed bid for global positioning system surveying kit (software and hardware) for the City of Birmingham, will be received by the Purchasing Agent, Room P-100 First Floor City Hall, Birmingham, Alabama, until 2:00 p.m., November 7, 2016, at which time and place they will be publicly opened and read.

Bidders wishing to bid can download the complete solicitation including the specifications and bid forms via the internet at www.birminghamal.gov (go to link titled Bidding Opportunities), or by visiting the Purchasing Office at the address shown above, or by calling (205) 254-2265, fax (205) 254-2484 and requesting a copy be mailed to you. Any addenda will be available on the internet. Bidder is responsible for checking the website for addenda until bid opening date. Addenda will be mailed to only those vendors who were provided a copy in person or by mail.

Bids are to be submitted on the bid form provided, and all quotations are to be f.o.b. Birmingham, Alabama delivered.

It is required that the bidder submits with his bid a certified check, a cashier's check or a bid bond payable to the City of Birmingham in the amount of \$500.00. In order for any bid award to be considered, it must be accompanied by an acceptable bid bond or check. Bid bond checks will be returned to all unsuccessful bidders after formal award is made and to the successful bidder after acceptance of award. Should the successful bidder fail to accept the award, the bid bond or check shall be forfeited.

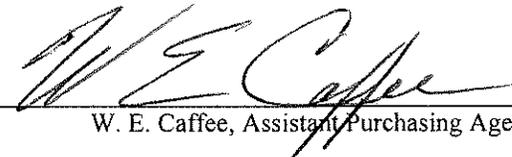
The City follows a policy of nondiscrimination. No contractor with the City should discriminate on the basis of race, sex, religion or national origin. Failure by the Vendor to carry out these requirements is a material breach of its obligations, which may result in its termination or such other remedy as the City deems appropriate.

No bid may be withdrawn for a period of sixty (60) days after the date of the bid opening.

The City reserves the right to reject any or all bids submitted in whole or part, and to waive any informalities.

Bid must be submitted in a sealed envelope marked, "**SEALED BID – GPS SURVEYING KIT - 2:00 P.M., 11/07/16**". Bids may be hand delivered to Room P-100 First Floor City Hall, Birmingham, Alabama, or mailed to City of Birmingham, P.O. Box 11295, Birmingham, Alabama 35202-1295. (DO NOT MAIL BIDS TO ROOM P-100 FIRST FLOOR CITY HALL). However, bids sent by any express carrier (Federal Express, UPS, DHL, etc.) must be mailed to 710 North 20th Street, and specify delivery to P-100 First Floor City Hall.

It is the bidder's responsibility to make sure that his bid is in the possession of the Purchasing Agent on or before 2:00 p.m., November 7, 2016. Bids received after this time will not be considered.


W. E. Caffee, Assistant Purchasing Agent

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B.N. 10-21-16

**SPECIFICATIONS FOR GPS SURVEYING KIT
FOR THE CITY OF BIRMINGHAM, AL**

GENERAL: The City of Birmingham is seeking bids for a GPS Surveying Kit. Award will be made to the lowest priced responsive, responsible bid submitted based on a total lot basis.

Municipalities are not liable for sales tax: reference Code of Alabama Section 40-23-4. Costs normally considered pass through costs (property tax, use tax, delivery charge, etc.) to the customer by the provider must be included in any fee proposed (Code of Alabama Section 40-12-222). For the purchase of personal property, the City's policy is to apply a local preference option, as allowed by State of Alabama Code, Section 41-16-50, in determining the low bidder.

Bidders are required to provide an original and two (2) copies of the bid.

Bids are to be submitted on the bid form provided, and all quotations are to be f.o.b. Birmingham, Alabama delivered.

The City will issue purchase order(s) to the successful bidder for the goods and/or services (bid items) that are the subject of the bid. Unless otherwise agreed in writing that is signed by both parties, the entire agreement between the City and the successful bidder concerning the bid items is comprised of the terms, conditions, specifications and requirements stated in (a) the contemplated purchase order(s), (b) this Invitation to Bid and Specifications and (c) your bid (collectively, the "Contract Requirements"). These writings supersede all former proposals, offers, negotiations, representations or agreements, either written or oral, concerning the provision of vendor's goods and/or services. By acceptance of the City's purchase order(s), the successful vendor agrees to abide by and perform its responsibilities related to the bid items in compliance with the Contract Requirements.

In order for any bid award to be considered your bid must have been accompanied by an acceptable bid bond, certified check or cashier's check in the amount of \$500.00 payable to the City of Birmingham. Bid bond checks will be returned to all unsuccessful bidders after formal award is made and to the successful bidder after acceptance of award. Should the successful bidder fail to accept the award, the bid bond or check shall be forfeited.

Successful bidder shall not assign this contract to any other party without prior written approval of the City of Birmingham. Contract shall not be assigned to an unsuccessful bidder who was rejected because he was not a responsive or responsible bidder.

The contract shall become effective from the date noted in the Notification of Award letter, which will be mailed to the successful vendor.

The City's standard payment term is Net-30 Days from acceptance. Exception may be allowed for discounted early payment, such as 2%-10, Net 30 Days. The reference date for all such discounted early payment terms will be the date the invoice is received or the date the goods are received, whichever is later. In the event of a dispute the City's records shall prevail. **The City will not consider any bids requiring C.O.D. payments.**

Any questions concerning these specifications should be addressed to Aisha Johnson, Purchasing Division, phone (205) 254-2265, fax (205) 254-2484, Monday through Friday, between the hours of 8:00 a.m. and 5:00 p.m.

Failure to adhere to any or all terms, conditions, and specifications as set forth in the contract may result in the immediate termination of the contract. Should termination occur, the holder of the contract may be declared a "non-responsible vendor". This declaration may result in the rejection of any future bids submitted by the vendor for a period of time to be determined by the City.

Bidder (and its employees, agents and any subcontractors) shall not discriminate on the basis of race, color, national origin, or sex in the performance of the services contemplated hereunder. Failure by the bidder to carry out these requirements is a material breach of its obligations, which may result in its termination or such other remedy as the City deems appropriate.

Bidder acknowledges and agrees that, consistent with federal law and City's public policy, it will encourage disadvantaged business enterprise (DBE) participation to the extent permitted by law. A "disadvantaged business enterprise" is a for-profit small business concern (i) at least 51% owned by one or more individuals who are both socially and economically disadvantaged or, in the case of a corporation, in which 51% of the stock is owned by one or more such individuals; and (ii) whose management and daily business operations are controlled by one or more of the socially and economically disadvantaged individuals who own it. In accordance with federal law, a "socially and economically disadvantaged individual" includes African-Americans, Hispanic Americans, Native American, Asian-Americans, women, and any additional groups designated as socially and economically disadvantaged by the federal Small Business Administration.

Contract award to purchase the service covered in this bid document shall be construed under and governed by the laws of the State of Alabama and each party hereto irrevocably agrees to be subject to the jurisdiction of the courts of the State of Alabama.

Successful bidder acknowledges and agrees that the City has the right to deduct from total amount of consideration to be paid, if any, to the successful bidder under this agreement all unpaid, delinquent, or overdue license fees, taxes, fines, penalties, and other amounts due the City from the successful bidder.

Any successful bidder who is not currently set up as a vendor in the City of Birmingham vendor file will be required to submit a completed W-9 tax form prior to any award. The W-9 tax form may be submitted with your bid or no later than seven (7) working days of receipt of notice of intent to award.

The City of Birmingham must have a copy of the successful bidder's current City of Birmingham business license prior to formal award of contract. Each bidder may submit a copy of his/her license along with his/her bid. However, bidder must provide a copy of his/her current business license no later than seven (7) working days of receipt of notice of intent to award. Failure to submit the requested information will result in the notice of intent to award being revoked.

Successful Vendor (located in the State of Alabama or located outside of the State of Alabama, but employs one or more employees within the State of Alabama) represents and warrants that it does not knowingly employ, hire for employment, or continue to employ an "unauthorized alien", as defined by the Beason-Hammon Alabama Taxpayer and Citizen Protection Act, Act No. 2011-535 (H.B.56) of the Alabama Legislature, as amended from time to time (the "Act") and that, during the performance of this contract, Vendor shall participate in the E-Verify program as required under the term of the Act. Vendor agrees to comply with all applicable provisions of the Act. As a condition for the award of any contract, Vendor shall provide documentation establishing that the Vendor is enrolled in the E-Verify program, or a signed, written statement that the Vendor does not have a presence (one or more employees) in the State of Alabama. Vendor may submit applicable documentation with his/her bid or no later than seven (7) working days of receipt of notice of intent to award. Furthermore, a contracting party found to be in violation of this provision shall be deemed in breach of the contract/agreement and shall be responsible for all damages resulting therefrom.

BID SPECIFICATIONS

The City is seeking bids for a global positioning system (GPS) surveying kit and post processing software. GPS surveying kit includes two (2) units (base and rover), GPS data processing software, data collector, batteries, and all necessary hardware (tripods, antenna, poles/carry bags, cradles assembly, pole bracket, cables, tribrach, etc.) and software to make the unit operational along with post processing software, a minimum of two (2) days field and office training and support services of one (1) year phone and web access. Bidder is to provide a detailed listing of all items proposed to make up the system along with pricing for each item. Bidder is to provide manufacturer’s detailed warranty statement for all items proposed – parts and labor.

All participant bidders shall mark conspicuously – **compliance or non-compliance with an “X”** in the appropriate column beside each specified item. Those items marked in the “**NO**” column must be explained in detail on the provided “**Exceptions to Specifications**” pages.

Base and Rover	Bidder Complies	
	Yes	No
<u>GNSS Receiver Features:</u>		
<ul style="list-style-type: none"> • Receiver weight of no more than 2.49 lbs. with battery, radio and antenna • Receiver to have a minimum of 440 channels for SV tracking • Receiver compatible with RTX Satellite Positioning technology • Receiver needs to be able to maintain RTK accuracies in the event of a radio or cellular signal lost for up to 5 minutes. It must be able to automatically switch back to normal RTK corrections if radio or cellular signal is regained within that 5 minute timeframe. • Receiver must work seamless (uninterrupted Bluetooth connection) with a controller that has the ability to display an electronic level bubble. • Electronic Bubble shall have the ability for controller to store tilt for RTK measurements. • Receiver must use a removable battery with batteries that have a built-in power indicator <p>Receiver must have an integrated quick release for ease of attachment.</p>		
<u>GNSS Receiver Specifications:</u>		
<p>GNSS Satellite signals tracked simultaneously:</p> <ul style="list-style-type: none"> • GPS: L1C/A, L1C, L2C, L2E, L5 • GLONASS: L1C/A, L1P, L2C/A, L2P, L3 • SBAS: L1C/A, L5 (for SBAS satellites that support L5) • Galileo: GIOVE-A AND GIOVE-B, E1, E5A, E5B • COMPASS: B1, B2, B3 • OmniSTAR HP, XP, G2, VBS positioning • QZSS, WAAS, MSAS, ENOS, GAGAN <p>GNSS Unit shall update at Positioning Rates: 1 Hz, 2 Hz, 5 Hz, 10 Hz, and 20 Hz</p>		
<p>GNSS Accuracy should meet or exceed these tolerances:</p> <ul style="list-style-type: none"> • Real Time Kinematic surveying • Single Baseline <30 km • Horizontal.....8 mm + 1 ppm RMS • Vertical.....15 mm + 1 ppm RMS • Network RTK3 • Horizontal.....8 mm + 0.5 ppm RMS • Vertical.....15 mm + 0.5 ppm RMS • RTK start-up time for specified precisions.....2 to 8 seconds 		

Base and Rover	Bidder Complies	
	Yes	No
<u>GNSS Unit shall meet or exceed these specifications:</u>		
<p>Communications Data Storage</p> <ul style="list-style-type: none"> • Serial: 3-wire serial (7-pin Lemo) • USB: supports data download and high speed communications • Radio Modem: fully Integrated, sealed 450 MHz wide band receiver/transmitter with frequency range of 410 MHz to 470 MHz <ul style="list-style-type: none"> - Transmit power: 2 W - Range: 3-5 km typical/10 km optimal • Cellular: integrated, 3.5 G modem, HSDPA 7.2 Mbps (download), GPRS multi-slot class 12, EDGE multi-slot class 12, UMTS/HSDPA (WCDMA/FDD) 850/1900/2100MHz, Quad-band EGSM 850/900/1800/1900 MHz, GSM CSD, 3GPP LTE • Bluetooth: fully integrated, fully sealed 2.4 GHz communications port (Bluetooth®) • Wi-Fi: 802.11 b,g, access point and client mode, WEP64/WEP128 encryption • External communication devices for corrections supported on – Serial, USB, Ethernet, and Bluetooth ports • Data storage: 4 GB internal memory; over three years of raw observables (approx. 1.4 MB/day), based on recording every 15 seconds from an average of 14 satellites • CMR+, CMRx, RTCM 2.1, RTCM 2.3, RTCM 3.0, RTCM 3.1 input and output 24 NMEA outputs, GSO, RT17 and RT27 outputs WebUI • Offers simple configuration, operation, status, and data transfer • Accessible via Wi-Fi , Serial, USB, and Bluetooth • Trimble or equal 		

Data Collector	Bidder Complies	
	Yes	No
Processor: Texas Instrument Sitara 3715 series AMR Cortex-A8 Processor (800 MHz)		
Robotics Radio: Integrated 2.4 GHz frequency-hopping, spread-spectrum radio		
Memory: 256 MB RAM with 8GB non-volatile NAND Flash Storage on board		
Expansion: SDHC memory slot, USB host		
Shall have an integrated AT&T/T-Mobile quad-band GSM/GPRS/EDGE 850/900/1800/1900 MHz, 2/6Mbit/s 3G HSDPA GSM WWAN cell data modem, Bluetooth 2.0+EFR and WIFI 802.11 b/g		
Shall have an integrated electronic compass and accelerometer and single frequency GPS (WAAS enabled) that allows for navigation to and storage of points		
Shall have an integrated 5MP autofocus digital camera with dual white light LED flash that can also operate as a flashlight. Must support geo-referencing of point utilizing internal GPS		
MUST utilize the latest Microsoft Windows Mobile 6.5 Professional operating system with all functionality (NOTE: CE NET operating systems will not be accepted and earlier versions of Windows Mobile may be rejected as well)		
Shall not weigh more than 1.10 kg (2.4 lb.) including rechargeable battery and integrated radio		
Humidity: 90%RH temp cycle -20/60° C (-4/140° F) MIL-STD-810G, Method 507.5		
Sand and dust: IP6x: 8 hours of operation with blowing talcum powder (IEC-529)		
Water: Ipx7: Immersed in 1 m of water for 30 minutes (IEC-529)		
Drop: 26 drops at room temperature from 1.22 m (4 ft.) onto plywood over concrete		
Vibration: General minimum integrity and Loose Cargo test MIL-STD-810G, Method 514.6, Procedures I, II		
Shall operate in an altitude in accordance with MIL-STD-810F, Method 500.5, Procedures I, II and III – 15,000 ft. at +73° F		
Shall operate in extreme temperatures of -22° F to +140° F and temperature shock -35/65° C (-31/149° F) MIL-STD-810G, Method 507.5		
Shall operate from power utilizing ultra-long-life 11.1V, 2600 mAh, 28.9 Wh lithium-ion battery that gives up to 34 hours of power depending on weather conditions. Full charge in 3 hours		
Notification LEDs: 3x tri-colored		
Display: 4.2 in (107mm) landscape VGA display, 640 x 480 pixels sunlight readable color TFT with LED backlight, resistive touchscreen		
Keyboard: Full QWERTY keypad with 10-key number pad, directional buttons, and 4 programmable buttons. Up/Down and Left/Right arrow keys shall be used as a “joystick” to turn the instrument in robotics mode		
Audio: Integrated speaker and microphone with 3.5mm stereo headset connection for audio system events, warnings and notifications		
I/O: USB Host (full speed), USB Client (full speed). DC power port, 9-pin serial RS232		
Shall have capability to perform Integrated Surveying from both GPS and optical robotic total stations		
Shall interface seamlessly with office software		
Trimple or equal		

GPS Data Processing Software	Bidder Complies	
	Yes	No
<p>1. Installation and Operation</p> <ul style="list-style-type: none"> • The software must correctly install and operate on the following operating systems: <ul style="list-style-type: none"> ○ Microsoft Windows 7 (32- and 64-bit versions) • The software must operate fully under a limited user account. • The software must fully support the following languages including the application and documentation: <ul style="list-style-type: none"> ○ English (US) 		
<p>2. Licensing</p> <ul style="list-style-type: none"> • The software must install, open, and operate in a limited state when unlicensed. Limited operation includes import, visualization, and sharing of Trimble Business Center projects. • The software must support licensing on USB hardware locks (dongles), or floating software licenses that can be installed on a server. • The software must be able to “check-out” floating licenses onto a mobile workstation for a user-defined time period. • The software must be able to support offline license activation in case where end user doesn’t have access to the internet. 		
<p>3. Updates</p> <p>The software must be able to automatically or manually check for and install updates, such as new versions, patches, and updated components over the internet.</p>		

GPS Data Processing Software	Bidder Complies	
	Yes	No
<p>4. Built-in Training</p> <ul style="list-style-type: none"> • The software must include tutorials with sample data to train users how to perform major tasks: <ul style="list-style-type: none"> ○ Setting up a new project ○ Importing GNSS data ○ Processing GNSS baselines ○ Importing digital level data ○ Importing total station data ○ Adjusting the network ○ Processing feature codes ○ Using spreadsheets, selection sets, and COGO controls ○ Working with VX scanned data ○ Working with corridors ○ Working with super elevations ○ Calibrating a Site ○ Working with 3D Data and Trimble RealWorks ○ Importing As-Staked Points ○ Measuring Photogrammetry Points ○ Processing Aerial Survey data ○ Processing Terrestrial Photo Station data • The software must provide work-flow guides to assist users in the step-by-step performance of major tasks with their own data: <ul style="list-style-type: none"> ○ Set up a new project ○ Import GNSS data ○ Process GNSS baselines ○ Import digital level data ○ Import total station data ○ Adjust the network ○ Process feature codes ○ Create a corridor ○ Add super elevations to a corridor ○ Calibrating a Site ○ Measure a Photogrammetry Point ○ Processing Aerial Survey Data ○ Process Terrestrial Photo Station Data 		
<p>5. Connectivity</p> <ul style="list-style-type: none"> • The software must be able to download the following data from the internet: <ul style="list-style-type: none"> ○ GNSS reference station observables ○ Precise GNSS orbits ○ US National Geodetic Survey (NGS) datasheets ○ GNSS almanac files • The software must provide an interface to upload files to the following processing services: <ul style="list-style-type: none"> ○ Trimble RTX-PP post processing service ○ Online Positioning User Service (OPUS) static and rapid-static ○ AUSPOS ○ CSRS-PPP • The software must be able to retrieve session data and create automatic downloads from network- enabled GNSS base stations. 		

GPS Data Processing Software

Bidder Complies

Yes **No**

- The software must contain a library with the following geoid models:

- | | | |
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| <ul style="list-style-type: none"> ☛ Atlantic Canada HT2 ☛ AUSGeoid09 (Australia) ☛ AUSGEOID98 (Antarctica) ☛ AUSGEOID98 (Australia) ☛ AUSGEOID98 (South pole) ☛ Brazil SIRGAS Geoid Model 2010 ☛ Canada Geoid Model HT2_0 ☛ CARIB97 (Caribbean) ☛ Colombia Geoid 2004 ☛ DMA 10x10 (Global) ☛ DNN (Denmark) ☛ DVR90 (Denmark) ☛ DVR90 2013 (Denmark) ☛ EGM 2008 Costa Rica ☛ EGM 2008 Dominican Republic ☛ EGM96 (Global) ☛ FIN2000 ☛ GEOID03 (Alaska) ☛ GEOID03 (Conus) ☛ GEOID03 (Hawaii) ☛ GEOID03 (Puerto Rico) ☛ GEOID09 (Alaska) ☛ GEOID09 (American Samoa) ☛ GEOID09 (Conus) ☛ GEOID09 (Guam) ☛ GEOID09 (Hawaii) ☛ GEOID09 (Puerto Rico) ☛ GEOID12A (Alaska) ☛ GEOID12A (American Samoa) ☛ GEOID12A (Conus) ☛ GEOID12A (Guam) ☛ GEOID12A (Hawaii) ☛ GEOID12A (Puerto Rico) ☛ GEOID96 (Alaska) ☛ GEOID96 (Conus) ☛ GEOID96 (Hawaii) ☛ GEOID96 (Puerto Rico) | <ul style="list-style-type: none"> ☛ GEOID99 (Alaska) ☛ GEOID99 (Conus) ☛ GEOID99 (Hawaii) ☛ GEOID99 (Puerto Rico) ☛ GGF97 (Corse) ☛ GSI Geoid 2000 ☛ Guadeloupe -(Grande) Basse Terre ☛ Guadeloupe -La Desirade ☛ Guadeloupe -Les Saintes ☛ Guadeloupe -Marie Galante ☛ Guadeloupe -Saint Barthelemy ☛ Guadeloupe -Saint Martin ☛ Guyane ☛ HBG03 (Belgium) ☛ Iceland geoid 2001 ☛ Italiceo 90 ☛ La Reunion ☛ Lithuania Geoid Model ☛ LVL98 (Latvia) ☛ Malaysia Geoid 2004 ☛ Martinique ☛ Mexican Geoid 2006 ☛ MEXICO97 (Mexico) ☛ Minnesota GEOID09 ☛ Minnesota GEOID12A ☛ Netherlands (2004) ☛ Netherlands (2008) ☛ Netherlands (De Min) ☛ New Zealand Geoid 2005 ☛ New Zealand Geoid 2009 ☛ NGNC ☛ NN1954-01 (Norway01) ☛ NN1954-05 (Norway05) ☛ NN1954-06 (Norway06) ☛ NN1954-07 (Norway07) ☛ NN1954-08 (Norway08) ☛ NN2000 (Norway10) | <ul style="list-style-type: none"> ☛ NN2000 (Norway13) ☛ Northern Ireland ☛ OSGM02 (United Kingdom) ☛ OSGM91 (United Kingdom) ☛ OSU91A (Global) ☛ Portugal Geoid (GeodPT08) ☛ RAC09 (Corse) ☛ RAF09 (France) ☛ RAF96 (France) ☛ RAF98 (France) ☛ RANC08 (New Caledonia) ☛ Republic Of Ireland ☛ ROvT4 (Romania) ☛ South Africa Geoid 2010 ☛ SW082000 (Sweden) ☛ SW08RH70 (Sweden) ☛ SWEN01L (Sweden) ☛ SWEN05LR (Sweden) ☛ SWEN98L (Sweden) ☛ Wisconsin GEOID09 ☛ Wisconsin GEOID12A |
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- The software must be able to create a default projection.
- The software must provide a tool to create and edit coordinate systems, datum transformations, ellipsoids, and geoid models.
- The software must provide a tool to create and manage sub-grids of geoid models.
- The software must provide a tool to create and manage datum grids.
- The software must be able to store user and company information as part of a project, including company name, address, website, email, phone number, fax number, office user name/phone/fax/email, and field operator name/phone/fax/email.
- The software must allow the user to configure the desired project units for coordinates, distances, angles, azimuths, vertical angles, pressure, temperature, GPS time, stationing, area, and volume.

GPS Data Processing Software	Bidder Complies	
	Yes	No
<p>7. Views</p> <ul style="list-style-type: none"> • The software must be able to create multiple planimetric views. • The software must be able to create multiple 3D views. The user must be able to change the point of rotation. The user must be able to adjust the vertical exaggeration. The user must be able to walk through the 3D view. • The software must be able to display panoramic images captured by a total station with a camera and superimpose survey data. The panoramic display must be able to navigate from station to station using on-screen selection, a list of stations, and forward/back controls. The plan view must indicate which panoramic views are open, which way they are facing, and their dynamic zoom state. • The software must be able to visualize images captured by a Trimble Vision and Trimble UAS platforms. The view must be perspective and include overlaid survey data. • The software must be able to view the project data in Google Earth, including points with feature codes and attributes as well as lines and alignments. • The software must be able to view the following data in customizable spreadsheets that can be copied/pasted: <ul style="list-style-type: none"> ○ Points ○ Vectors ○ Static GNSS occupations ○ Total station (optical) observations ○ GIS Features ○ Photogrammetry Points and Observations • The software must allow simple copy/paste of spreadsheet information into MS Office application. • The software must be able to display GNSS occupations in a chronological view to easily identify sessions and disable dependent baselines. • The software must provide a tree-style interface to view all points, alignments, surfaces, media files, corridors, and imported files in the project. • The software must be able to display the contents of a field data file chronologically. • The software must provide an interface to easily create and edit selection sets. • The software must provide an interface to easily filter the elements that are displayed in each view. • The software must provide an interface to review all of the unresolved errors in the project. • The software must provide an interface to launch a command from a list of all available commands. • The software must provide a dynamic display for location of the cursor in the plan view that can be configured as: <ul style="list-style-type: none"> ○ Grid Coordinate ○ Station, Offset ○ Surface Elevation ○ Latitude, Longitude ○ Azimuth, Distance ○ Delta X, Delta Y • The software must be able to launch commands and open interfaces from a set of customizable toolbars. • The software must be able to launch commands and open interfaces from a set of customizable drop-down menus. 		

GPS Data Processing Software		Bidder Complies	
		Yes	No
<p>8. Device Connections, Imports, Exports, and Reports</p> <ul style="list-style-type: none"> The software must be able to directly connect to field devices, including the Trimble TCU, Trimble TSC2, Trimble TSC3, Trimble M3, Trimble S3 Autolock/Servo, and Trimble Recon in order to upload and download files. The software must be able to connect to a Trimble Tablet via Trimble Tablet Sync. The software must recognize the version of field software loaded on the field device and export the correct version to it. The software must be able to automatically recognize and import the following file formats by field software: 			
<p>Ashtech™ ProMark and ProFlex receivers</p> <p>GNSS receivers/ Survey devices</p> <p>Spectra Precision® Field Surveyor</p> <p>Survey Pro™</p> <p>TDS Interlock™</p>	<p>.ddd (ddd is the GPS day)</p> <p>.crd</p> <p>.dat</p> <p>.t00/.t01/.t02 (see note on .t02 files below)</p> <p>ASCII</p> <p>.asc</p> <p>.dat</p> <p>.xml</p> <p>.job</p> <p>.raw</p> <p>.survey</p> <p>.xml</p> <p>.ilj</p>		
<p>Trimble® Access™</p> <p>Trimble® Digital Fieldbook™ (v2, v3, and v5)</p>	<p>.dc</p> <p>.job</p> <p>.jxl</p> <p>.rxl</p> <p>.xml</p> <p>.job</p> <p>.dc</p> <p>.xml</p>		
<p>Trimble® SiteVision Office/ Caterpillar® Accugrade™</p>	<p>.avoid</p> <p>.dsp</p> <p>.mch</p> <p>.persist (.mch and .dsp for paving)</p> <p>.pro</p> <p>.svd</p> <p>.svl</p> <p>.tsd</p>		
<p>Trimble® Survey Controller™</p> <p>Trimble® Survey Manager™</p>	<p>.dc</p> <p>.job</p> <p>.jxl</p> <p>.rxl</p> <p>.xml</p> <p>ASCII</p> <p>.jxl</p>		

GPS Data Processing Software		Bidder Complies	
		Yes	No
<ul style="list-style-type: none"> The software must be able to automatically recognize and import the following file formats: 			
.12da .ali .alz .asc .avoid.svl .bmp, .jpg, .png, .tif .cal .cfg .crd, .mos, .txt .csv (custom import)	12D files ISPOL horizontal alignment files CLIP vertical alignment file ASCII, TDEF, raw data files, InRoads horizontal and vertical alignment files SiteVision avoidance zone files Image files Calibration files Coordinate system configuration files GENIO files ASCII text, point files, station, offset, elevation files		
.dat .dc .dgn .dsp, .persist .dxf, .dwg .ds, .htm .eje .gcj	GNSS files, DiNi level files Trimble data collector, road definition files MicroStation design files GCS display files CAD files NGS data sheet files MDT horizontal alignment files SCS work order results files		
.hpt .ilj .ini .job .jxl .mch .pts (custom import) .plt	HYDROpro™ files TDS Interlock job files Site settings files GNSS Job files JobXML files GCS measure up files ASCII point, DTM files CLIP horizontal alignment files		
.pro .ras .raw .reb, * (.021, .040, .066, .66) .rxl .06o .sce/.scl .soe .sp3, .sp3c .spj	Terramodel project files ISPOL vertical alignment files, MDT vertical alignment files TDS, raw data files Rangefinder laser files REB roadway and/or surface files RoadXML files RINEX (GPS base files) ISPOL alignment cross-section files InRoads alignment cross-section files Precise ephemeris files SCS work order results files		

GPS Data Processing Software		Bidder Complies	
		Yes	No
.svd .svl .tra .trv .tsd .tsf .ttm .t00/.t01/.t02 .txt .xml .yxz	SiteVision design files SiteVision linework files MDT alignment cross-section files CLIP alignment cross-section files Planar surface files Trimble scanner files Trimble surface files GNSS data files SCS work order results files, CARTOMAP files LandXML files Wirth YXZ files		
<ul style="list-style-type: none"> The software must be able to export the following formats: 			
.asc .bmp, .gif, .jpg, .png, .tif	ASCII, point, Nikon NEH, Nikon TS, TDEF files image/background map files		
.cdg .csd .csv, .txt .dc .ddf .dgg .dxf, .dwg .fal, .fcl, .fxl .ggf .ilj .ini .job .jxl .kml, .kmz	ASCII text, point, trajectory files, event data, NGS data sheets Trimble data collector files Data dictionary files CAD files Feature files Geoid files TDS Interlock files Site settings, antenna files TDS Survey Pro, Trimble Digital Fieldbook/GNSS files JobXML files Earth browser (Keyhole Markup Language (KML)) files containing 3D geographic coordinates (and photos with .kmz)		
.pro .profile .pts .rxl .svd	Terramodel project files Hydraulic excavator profile files ASCII point files RoadXML files Job site design files for GCS machines		
.svl .tsd .avoid.svl .ttm .txt .xml	Site map files for GCS machines Planar surface files Avoidance zone files for GCS machines Trimble surface files SCS work order report and record files LandXML files		

GPS Data Processing Software	Bidder Complies	
	Yes	No
<ul style="list-style-type: none"> • The software must provide a direct exchange format to Trimble GPSeismic. • The software must be able to import and export CAD elements such as points, lines, and surfaces in SketchUp (.skp) format. • The software must be able to create the following reports: <ul style="list-style-type: none"> ○ Alignment Geometry ○ Baseline Processing ○ Corridor Definition ○ Corridor Earthwork ○ Earthwork ○ Import ○ Level ○ Mean Angle ○ Network Adjustment ○ Point Derivation ○ Point List ○ Project Computation ○ Site Calibration ○ As-staked Report ○ As-staked Corridor Report ○ Surface Information ○ Vector List ○ Flight Mission Adjustment Report 		

GPS Data Processing Software	Bidder Complies	
	Yes	No
<ul style="list-style-type: none"> • The software must be able to create custom point exports with the following fields: <ul style="list-style-type: none"> ○ General: Point ID, Feature Code, Description 1, Description 2, Attributes, Layer, Projection Scale Factor, Height Scale Factor, Combined Scale Factor, Meridian Convergence Angle, Geoid Height, Northing, Easting, Elevation, Local Latitude, Local Longitude, Local Ellipsoid Height, Global Latitude, Global Longitude, Global Ellipsoid Height, ECEF X, ECEF Y, ECEF Z ○ Observed by Level: From Point ID, To Point ID, Status, Level Model, Backsite Readings, Foresight Readings, Delta Elevation, Delta Correction, Final Delta Elevation, Adjusted Elevation, Length of Run, Number of Setups, Vertical Precision ○ Observed by GNSS: Vector ID, From Point ID, To Point ID, Solution Type, Status, Start Time, End Time, Duration, PDOP, RMS, Horizontal Precision, Vertical Precision, # Satellites, Epochs, Geodetic Azimuth, Ellipsoid Distance, Delta Height, Delta XYZ, Vector Length, Field Method, From Antenna Height, From Antenna Method, From Antenna Manufacturer, From Antenna Type, To Antenna Height, To Antenna Method, To Antenna Manufacturer, To Antenna Type ○ Observed By Total Station: Observation ID, Station ID, Orientation ID, Status, 1st Backsite ID, From Point ID, To Point ID, Horizontal Circle Reading, Vertical Circle Reading, Slope Distance (Raw), Horizontal Angle, Vertical Angle, Azimuth, Face, Instrument Height, Instrument Height Method, Instrument Model, Target Height, Target Method, Prism Constant, Prism Type, Backsite ○ Network Adjustment: Northing Error, Easting Error, Elevation Error, Height Error, X Error, Y Error, Z Error, 3D Error, Semi-Major Axis, Semi-Minor Axis, Semi-Major Azimuth, North Constraint, East Constraint, Height Constraint, Elevation Constraint ○ As-Staked Point: Feature Code, Point ID, Design Point ID, Design Northing, Design Easting, Design Elevation, Delta Northing, Delta Easting, Delta Elevation ○ As-Staked Corridor Point: Point ID, Corridor Name, Station, Offset, Node Name, Cut/Fill, Delta Station, Delta Offset, Horizontal Construction Offset, Vertical Construction Offset ○ As-Staked Catch Point: Point ID, Corridor Name, Station, Node Name, Delta Station, Horizontal Construction Offset, Vertical Construction Offset, As-Staked Side Slope, Horizontal Distance to Hinge, Vertical Distance to Hinge ○ As Staked Line Point: Point ID, Line Name, Station, Offset, Delta Station, Delta Offset, Delta Elevation, Grade to Line, Geometry Type ○ As-Staked Surface Point: Point ID, Surface Name, Feature Code, Cut/Fill, Vertical Offset <p>As-Staked Alignment Point: Point ID, Alignment Name, Station, Offset, Node Name, Cut/Fill, Delta Station, Delta Offset, Horizontal Construction Offset, Vertical Construction Offset</p>		
<ul style="list-style-type: none"> • The software must be able to create custom imports for points with the following fields: <ul style="list-style-type: none"> ○ Easting ○ Elevation ○ Global Ellipsoid Height ○ Local Ellipsoid Height ○ Global Longitude ○ Local Longitude ○ Northing ○ Point ID ○ X (ECEF) ○ Y (ECEF) ○ Z (ECEF) 		

GPS Data Processing Software	Bidder Complies	
	Yes	No
<p>9. GNSS Post-Processing</p> <ul style="list-style-type: none"> • The software must be able to post-process static and kinematic GNSS carrier-phase data. • The software must be able to automatically send raw GNSS files to external point positioning services and receive the updated point locations. • The software must be able to use the capabilities of a workstation with multi-core CPU's to process baselines more efficiently. • The software must display the order in which GNSS baselines will be processed, both in parallel and in series. • The software must be able to offer an elevation mask setting to eliminate unwanted observation for satellites that are very low on the horizon. • The software must support the following GNSS antenna models: <ul style="list-style-type: none"> ○ NGS Absolute ○ IGS Absolute ○ NGS Relative ○ Proprietary models for all other antennas 		
<ul style="list-style-type: none"> • The software must be able to process the following GNSS observables: <ul style="list-style-type: none"> ○ GPS L1, L2, L2C, and L5 ○ GLONASS L1 and L2 ○ Galileo L1, E5 ○ QZSS L1, L2, L5 ○ BeiDou B1 and B2 • The software must be able to import proprietary and RINEX format (up to at least version 3.1) raw GNSS observation files. • The software must provide an interface to review and edit point, antenna, and receiver information on import. • The software must provide an interface to change the start and end time for the processing of an occupation. • The software must provide an interface to review satellite availability and cycle-slips and remove satellites from processing, either whole or by time-block. 		
<ul style="list-style-type: none"> • The software must be able to load pre-configured baseline processing style with the following settings: <ul style="list-style-type: none"> ○ Event Interpolation Type ○ # Event Interpolation Points ○ Antenna Calibration Source ○ Ephemeris Type ○ Processing Solution Type ○ Processing Frequencies ○ Processing Interval ○ Elevation Mask ○ Included Satellites • The software must provide an interface to review processed vectors and sort by the following: <ul style="list-style-type: none"> ○ From Point ○ To Point ○ Solution Type ○ Horizontal Precision ○ Vertical Precision ○ RMS ○ Distance 		
<ul style="list-style-type: none"> • The software must be able to warn a user when a vector solution exceeds user-defined precision and reliability criteria. • The software must be able to clear the processing results. • The software must be able to store and display processing residuals. 		

GPS Data Processing Software	Bidder Complies	
	Yes	No
<p>10. RTK Data</p> <ul style="list-style-type: none"> • The software must be able to import and display field data that includes RTK vectors and GNSS point solutions from RTK, RTX, WAAS or OmniStar. • The software must be able to re-compute point locations from RTK vectors. • The software must allow the user to edit the antenna information for RTK observations and GNSS point solutions. • The software must be able to update the coordinate of the RTK base station and automatically update all points measured from that base station. • The software must be able to warn a user when an RTK vector solution exceeds user-defined precision and reliability criteria. • The software must be able to import xFill observations as vectors tied to the GNSS base station or network reference station. • The software must be able to display device orientation, such as instrument tilt and warn the user when an occupation exceeds a user-defined tolerance for tilt. • The software must be able to recompute the Trimble R10 tilt compensated point in case users edits the RTK vector information. 		
<p>11. Total Station Data</p> <ul style="list-style-type: none"> • The software must be able to import and display field data that includes total station measurements. • The software must be able to re-compute point locations from direct and offset total station observations. • The software must be able to warn a user when a total station observation exceeds user-defined precision and reliability criteria. • The software must be able to update the coordinate of the total station setup and backsight(s), and automatically update all points measured from that setup. • The software must be able to calculate the position and orientation of a total station setup by resection. • The software must provide an interface to review and edit mean angle observation sets. • The software must be able to calculate the standard deviation for the mean horizontal angle, vertical angle, and slope distance in each mean angle observation set. • The software must be able to warn a user when observations within a mean angle observation set exceed user-defined conformance criteria. • The software must be able to produce a mean angle report. • The software must be able to calculate and display the horizontal and vertical precision of each total station observation. 		
<p>12. As-staked Data</p> <ul style="list-style-type: none"> • The software must be able to import as-staked deltas for the following types of stakeout: <ul style="list-style-type: none"> ○ Point ○ Line/Arc ○ Surface ○ Alignment ○ Point on Corridor ○ Corridor Catch-Point • The software must be able to display design information as well as stakeout deltas. • The software must be able to run automatic quality analysis and flag any as-staked deltas that exceed a user-defined tolerance. • The software must be able to produce a simple stakeout report containing all stakeout types. • The software must be able to produce a detailed and configurable report for corridor stakeout. • The software must be able to convert as-staked points to survey points in order to update their positions manually. 		

GPS Data Processing Software	Bidder Complies	
	Yes	No
<p>13. Digital Level Data</p> <ul style="list-style-type: none"> • The software must be able to import leveled observations from a Trimble DiNi digital level. • The software must be able to recognize field introduced errors and highlight these errors. • The software must be able to separate the level data into runs. • The software must be able to offer ability to delete selected setups and entire level runs. • The software must be able to display misclosure of closed runs, sum of foresite distances, and sum of backsite distances. • The software must optionally display the delta elevation and raw and adjusted elevation for each leveled point. • The software must be able to merge runs. • The software must be able to adjust runs using least-squares. • The software must provide interface to choose which leveled points will be imported into the project. • The software must provide interface to enter a standard error for leveling observations. • The software must be able to either create leveled points as benchmarks or create leveled observations to include in a network adjustment. 		
<p>14. GNSS Site-Calibration and Local Site Settings</p> <ul style="list-style-type: none"> • The software must provide interface to perform a GNSS site calibration which matches WGS84 points with local control coordinates. • The software must give the user the option to calculate a horizontal calibration, vertical calibration, or both. • The software must give the user the option to set the horizontal scale factor to 1. • The software must give the user the option for each control point to be used as 3D, 2D, or ignored. The software must be able to produce a site-calibration report that details the horizontal and vertical calibration parameters, and residuals for each control point used in the calibration. • The software must be able to save the calibration as a coordinate system that can be used for other projects. • The software must be able to send the calibration to field devices. • The software must be able to clear the site calibration. • The software must provide interface to enter local site setting to create a ground coordinate system that accommodates for differences between the local site and the ellipsoid. • The software must be able to calculate the ground scale factor from a point in the project. 		
<p>15. Least-Squares Adjustment</p> <ul style="list-style-type: none"> • The software must be able to perform a rigorous least-squares network adjustment with all observation types, including post-process GNSS, RTK GNSS, total station, and level observations. • The software must be able to perform a free adjustment without any constrained coordinates. • The software must be able to automatically list the control-quality points in the project. • The software must give the user interface to fix 2D, ellipsoid height, and elevation for each control-quality point. • The software must be able to alternatively allow the user to enter standard deviation values for each control quality point by 2D and height or northing, easting, and height. • The software must give the user the ability to select the source of standard errors and manually override standard error by observation type. 		

GPS Data Processing Software	Bidder Complies	
	Yes	No
<ul style="list-style-type: none"> • The software must give the user the ability to select the confidence level for scaling precision values. • The software must be able to create and store adjustment styles with settings for the covariance display and transformations. • The software must allow the user to choose to adjust individual total station observations or the means of observation sets. • The software must be able to calculate a network reference factor and perform a Chi Square test. • The software must be able to use scalars to alter the weighting for each observation type. • The software must be able to highlight observations which are statistic outliers. • The software must be able to produce a report that details the adjustment settings, network adjustment statistics, adjustment statistics by observation type, control point comparisons, control point constraints, adjusted coordinates (Grid, Geodetic, ECEF), error ellipse components, adjusted observations, and covariance terms. • The software must be able to clear the network adjustment 		
<p>16. Feature Code Management and Processing</p> <ul style="list-style-type: none"> • The software must be able to process feature coded field data to produce point, line, and polygon features with attributes. • The software must be able to clear feature code processing results. • The software must be able to import feature definitions from a field device or feature definition file. • The software must recognize line control codes, including the following: <ul style="list-style-type: none"> ○ Start New Line ○ Start Tangential Arc ○ End Line ○ End Tangential Arc ○ Join Line to Point ○ Start Non-tangential Arc ○ Ignore Join ○ End Non-tangential Arc ○ Close Line to Start Point 		
<ul style="list-style-type: none"> • The software must be able to create groups of codes that will display together in the field software for expedited feature collection. • The software must be able to process individual line features that are separated by an instance (centerline1, centerline2). • The software must provide a tool to create and edit symbols for point features. • The software must provide a tool to create and edit line styles. • The software must be able to draw symbols with a scale and orientation derived from an attribute value. • The software must be able to import feature definitions from an Esri geodatabase xml file. • The software must be able to update field collected feature codes when edits are made to processed features. 		
<p>17. Alignment and Corridor Creation</p> <ul style="list-style-type: none"> • The software must be able to create and import horizontal and vertical alignments. • The software must be able to edit horizontal alignments with segments, including lines, arcs, spirals-in, spirals-out, and combining spirals. • The software must support the following spiral types <ul style="list-style-type: none"> ○ Clothoid ○ Cubic ○ Bloss ○ Cubic Parabola (Korean method) 		

GPS Data Processing Software	Bidder Complies	
	Yes	No
<ul style="list-style-type: none"> • The software must be able to convert a CAD polyline to an alignment. • The software must be able to edit vertical alignments with segments including grade break, symmetrical vertical curve, asymmetrical vertical curve, vertical arc, and end of symmetrical curve. • The software must be able to edit alignments with station equations and station zones. • The software must be able to apply super elevation parameters and display a super elevation diagram. • The software must be able to create and edit corridors which apply one or more cross-sectional templates to an alignment. • The software must be able to use reference lines to define slopes and offsets for template nodes. • The software must be able to create side-slope elements that target a reference surface. • The software must be able to create template instructions, including the following: <ul style="list-style-type: none"> ○ Offset/Slope ○ Connect to another Node ○ Offset/Elevation ○ Super elevation ○ Side Slope ○ Slope/Slope 		
<ul style="list-style-type: none"> • The software must allow the user to define an offset by distance, COGO, node-to-node, an offset table, or a reference line. • The software must allow the user to define a slope by percent, ratio, node-to-note, or a slope table. • The software must allow the user to define a delta elevation by distance, COGO, node-to-node, a delta elevation table, or an elevation table. • The software must allow a user to create a side slope instruction by target surface and/or cut-slope, cut- ditch width, and fill slope. • The software must be able to mirror instructions from one side of the alignment to the other. • The software must be able to manage material layers for multi-level corridors. 		
<p>18. Point and Line Creation</p> <ul style="list-style-type: none"> • The software must be able to create new points by manual coordinate entry or by coordinate geometry (COGO) functions including: <ul style="list-style-type: none"> ○ Bearing Bearing Snap ○ Intersection of Lines Snap ○ Bearing Distance Snap ○ Intersection of Segments Snap ○ Distance Snap ○ Intersection of Offset Lines Snap ○ XY Snap ○ Intersection of Offset Segments Snap ○ End of Line Snap ○ Perpendicular to Line Snap ○ Middle of Segment Snap ○ Perpendicular to Segment Snap Point Snap ○ Offset Line Snap ○ Nearest to Line Snap ○ Offset Segment Snap ○ Intersection Point Snap 		

GPS Data Processing Software	Bidder Complies	
	Yes	No
<ul style="list-style-type: none"> ○ Factor of Line Snap ○ Fee Snap ○ Factor of Segment Snap ○ Center of Arc Snap ○ Tangent Snap ○ Point of Intersection Snap ○ Delta X Delta Y Snap ○ Center of Gravity Snap ○ Middle of Point to Point Snap 		
<ul style="list-style-type: none"> • The software must be able to specify the quality of a coordinate entry as Control, Survey, Mapping, or Unknown. • The software must be able to create multiple coordinate entries for a point. • The software must be able to merge points. • The software must be able to automatically merge points with identical point ID on import. • The software must provide an interface to choose which points will be merged on import when coordinates fall outside a user-specified tolerance. • The software must be able to merge duplicate points. • The software must be able to rename multiple points by adding a prefix, suffix, or constant to the point ID. • The software must be able to move, rotate, and scale grid-points. • The software must provide an interface to create a simple polyline with one elevation. 		
<ul style="list-style-type: none"> • The software must provide an interface to create and edit a complex linestring with separate elevations on each node. Editing tools must include trim/extend, break, join, delete segment, and set elevation. • The software must be able to create circular linestrings. • The software must be able to create arc objects. • The software must be able to create areas (polygons). • The software must be able to create a line at an offset to another line. • The software must be able to copy a line. • The software must be able to drape 2D points and lines on a surface to derive their elevations for stakeout. • The software must be able to create points from CAD drawings automatically extracting a large number of line endpoints, midpoints, arc/circle center, CAD points, insertion and intersection points for stakeout and further handling. • The software must be able to create points at user defined intervals allowing for horizontal and vertical offsets. 		
<p>19. Surfaces and Volumes</p> <ul style="list-style-type: none"> • The software must be able to create a surface from points, lines, and breaklines. • The software must be able to add/remove points, lines, and breaklines to/from a surface. • The software must be able to trim a surface to a boundary. • The software must provide a tool to trim a surface edge. • The software must be able to drape a background image over a surface. • The software must be able to add a texture to a surface. • The software must be able to create contours and index contours at a user-specified interval. • The software must be able to create a contour at a user specified elevation. • The software must be able to create a surface elevation grid with spot elevations created on a user-specified grid spacing. • The software must be able to create a cut/fill map from an initial and final surface. • The software must be able view the profile of a surface along a user-specified path. • The software must be able to merge multiple surfaces. 		

GPS Data Processing Software	Bidder Complies	
	Yes	No
<ul style="list-style-type: none"> • The software must be able to create a planar surface from two points, at a constant elevation, or from a point and a direction. • The software must be able to create and manage a library of materials for earthwork calculations. • The software must be able to calculate a volume and create an earthwork report for a stockpile/depression, surface-to-surface comparison, or a surface-to-elevation comparison. • The software must be able to breakdown a volume calculation by depth increment or elevation interval. • The software must be able to calculate and report end area volumes for a corridor. 		
<p>20. Imagery</p> <ul style="list-style-type: none"> • The software must be able to import and display digital images captured in the field as feature attributes or media files attached to points and lines. • The software must be able to send digital images captured in the field to Google Earth along with survey data. • The software must be able to import and display georeferenced background images. The software must be able to automatically tile and sample the images on import and display the appropriate level of resolution for the zoom state. • The software must be able to provide an option to (un)smooth images and provide individual pixel viewing ability. • The software must be able to provide pixel transparency setting for the georeferenced images to blend the image edges with the background. • The software must provide an interface to manually georeference a background image and report circular error for the result. • The software must be able to create a georeferenced image from the planimetric view at a user specified size, scale, rotation, and resolution. • The software must be able to import and display images captured by a total station with an integrated digital camera and superimpose survey data. • The software must be able to balance exposures, blend edges for image arrays captured by a total station with an integrated digital camera and Trimble V10 Imaging Rover. • The software must be able to create Google Earth (.kmz), single image (.jpeg) and .html package panoramas for viewing in a web browser for image arrays captured by a total station with an integrated digital camera and Trimble V10 Imaging Rover. 		
<p>21. Photogrammetry</p> <ul style="list-style-type: none"> • The software must be able to import and display panoramic and aerial images. • The software must be able to adjust the positions and orientations of images both automatically and by manually adding tie points and control points. • The software must provide an active and passive pixel selection cursor that displays the original image captured by the total station. • The software must be able to display a line-of-sight ray from the total-station location through the selected pixel. • The software must be able to aim other photo-stations at an adjustable point along a line-of-site ray. • The software must be able to calculate a best-fit point coordinate from two or more photogrammetric observations. • The software must display and allow edits to properties of a photogrammetric observation including Point ID, Instrument Height, Target Height, Image Name, Pixel Row, Pixel Column, Azimuth, Horizontal Distance, Vertical Distance, and pixel size. 		

GPS Data Processing Software	Bidder Complies	
	Yes	No
<ul style="list-style-type: none"> • The software must be able to calculate strength of figure that represents the quality of geometry for a photogrammetric intersection. • The software must be able to import and display flight and image data from a Gatewing X100 UAV. • The software must be able to adjust images using automatically detect tie points and registered ground control points. • The software must be able to merge flight missions from aerial imagery. The software must be able to create a colorized point cloud and digital surface model from aerial imagery. • The software must be able to create an orthophoto mosaic from aerial stereo imagery. 		
<p>22. Other Tools</p> <ul style="list-style-type: none"> • The software must provide a tool to inverse between points and report grid azimuth, grid distance, delta elevation, geodetic azimuth, ellipsoid distance, ground distance, and delta height. • The software must provide a tool to measure between two points and report the azimuth and distance. • The software must provide a tool to measure an angle with a start point, pivot point, and end point. • The software must provide a tool to measure a volume comprised of point clouds, surveyed points, 3D lines, and surfaces. • The software must provide an interface to create and edit CAD text with a user-defined text style, justification, height, rotation, leader, and insertion point. • The software must be able to automatically generate text for northing, easting, elevation, station, offset, length, area, line elevation, surface elevation, name, layer, and feature code. • The software must provide an interface to create plot boxes with a user defined scale, size, location, and rotation. • The software must be able to print/plot the contents of a plot box or entire contents of the planimetric view. • The software must provide a tool to convert Trimble Geomatics Office (TGO) projects to the software's project format. • The software must provide un-do and red-do functions. • The software must provide a tool to plan GNSS surveys based on satellite availability and geometry. • The software must provide the ability for the user to register the software online and become eligible for receiving notifications product releases, product upgrades, seminars and events, training and special offers. • Software to be Trimble or equal 		

Post Processing Software	Bidder Complies	
	Yes	No
<p>General</p> <ul style="list-style-type: none"> • CAD Platforms: IntelliCAD 7.2 • Project Setup: Flexible data and settings storage • Data Compatibility: Supports industry standard LandXML plus specific data conversions • Languages: English • Coordinate Systems: 100s of projections including SurvCE • CSLReport Formatter: Create customized, professional reports • Symbol Library: Hundreds of 2D and 3D symbols • Project Setup: Flexible data storage methods • Drawing Explorer: Manage and access project data files • Drawing Cleanup: Fix common drafting errors • Drafting Enhancements: Handy tools for working in Autocad® such as Join Nearest, Shrinkwrap Entities, Polyline Utilities, Drawing Inspector, Layer Inspector and Twist Screen • Data Compatibility: Supports industry standard LandXML and scores of specific data conversions • Document Management: Use Data Depot for sharing and archiving files • CAD Standards: Draw items with standardized properties 		
<p>CAD Standards</p> <ul style="list-style-type: none"> • Draw Standard Item: Create common CAD entities with pre-defined properties • Settings Explorer: Manage all program settings from single interface • Settings Libraries: Setup tables for symbols, layers, road templates, etc. • Data Depot: Document management for workgroups and archiving • Project Sub-Folders: Custom controls of data folders by type 		
<p>Survey Commands</p> <ul style="list-style-type: none"> • Data Collection Interfaces: Upload and download to popular data collectors • Traverse Adjustment: Spreadsheet editor for raw data with graphics and processing for traverse adjustments • SurvNET: Advanced network least-squares for total station, GPS and level data • Field-to-Finish: Draw points with styles and in point groups set by point descriptions and draw linework by several flexible methods • Field-to-Finish Inspector: Inspect all field-to-finish elements, see description source and re-draw based on descriptions edits • COGO: Streamlined inverse, traverse, sideshot, intersections, interpolation, translate, rotate, scale and align • Coordinate Transformations: Transform coordinates and screen entities between lat/lon and grid projections as well as local to local by Helmert and least-squares methods • Deeds: Enter deed by description, read deed data from deed file, deed reports, deed correlation and generate legal description from drawing • Cut Sheets: Create custom cut sheet reports with reference grades and station-offsets 		
<p>Surface Commands</p> <ul style="list-style-type: none"> • Build Surfaces: By triangulation or rectangular grids • Contouring: One step triangulate and contour from 3D entities as well as contouring from surface files • Triangulation Utilities: TIN math and offset, simplify and merge functions • Surface Manager: Change surface display properties and adjust surface functions to add and remove points and breaklines and swap edges • Volumes: Earthwork volumes between triangulation or grid surfaces • Pad Design: Tie cut/fill slopes from pad perimeter to surface, build pad surface, calculate and balance volumes, and edit pad parameters • 3D Surface Flyover: 3D viewer with vehicle to drive over surface or follow 3D path • Slope Analysis: Slope reports and zone analysis 		

Post Processing Software	Bidder Complies	
	Yes	No
Hydrology <ul style="list-style-type: none"> • Site Drainage – Using either Rational or SCS Method • Runoff Analysis – Determine Watershed Area, Time of Concentration & Peak Flow Rates • Storm Drain System Design & Drafting • Pond Design & Sizing • Automatically determines watershed areas and maximum length of runoff from DTM • Tap extensive libraries on rainfall, inlets, manholes, outlets • Calculate inlet intercepted and bypass flows, gutter spread and depth, pipe flow depth and velocity, and hydraulic and energy grade lines • Get warnings for collisions, excessive pipe lengths, insufficient cover, lack of slope, excessive flow rates, and more • Track runoff and analyze watershed – choose entire area or the watershed above a point such as a catch basin • Design ponds, culverts, channels and outlet control structures • Draft sewer pipe dynamically in plans, profiles and 3D • Create a system-wide stormwater solution in 3D • Get detailed pre- and post-construction hydrologic runoff analysis and reporting • Create advanced storm drain design • Determine precise pond design and sizing • Get simultaneous analysis of Hydrologic Soil Groups, Ground Covers and Watersheds • Generate accurate Hydrographs utilizing software’s distinct Subareas • Input, edit, label, inspect and report GIS data to entities via simple tools, including querying for parcels or entities that meet conditions • Obtain topographic and planimetric features from county database • Import imagery and terrain data from Google Earth • Import dynamic map services from Esri® ArcGIS® Server • Perform preliminary engineering studies, hydrologic studies and planning analysis • Assign names to layers and then report sub-areas within a perimeter using closed polylines on those layers • Create geo-referenced image by user-specified coordinates for two image points • Create world file by image position in drawing • Import SHP file with support for pointM, polylineM and ploygonM shape files, with option to reassign entity elevations from the elevations in a 3D SHP file • Image Set Manager to handle large image areas and automatically adjust the resolution based on your zoom level • Drape Images on 3D Surfaces and view in 3D • Attach images to entities and then use the Image Inspector to view the images 		
Road Design <ul style="list-style-type: none"> • Template Design: Detailed yet simple template design • Template Transitions: Define transitions for templates and super elevation • Road Network: Dynamic road design with intersections and cul-de-sacs 		
GIS Commands <ul style="list-style-type: none"> • GIS Data: Input, edit, query, report, label and inspect database data attached to drawing entities • ESRI: Import/Export feature data by Esri MSC or SHP • Geo-Referenced Images: Place geo-referenced images into the drawing • Place Camera Symbol/Image: Draw a camera symbol with an attached image 		
Centerlines <ul style="list-style-type: none"> • Design and Edit Centerlines: Design or input alignments on screen or in dialog with graphics • Label Stations and Offsets: Annotate station and offsets along centerline and at selected points • Calculate Offsets: Reports stations and offsets for selected points along centerline • Create Offset Points: Create points at specified stations and offsets • Spirals: Flexible handling of the most complex spiral curves including “spiral-only” elements going arc-spiral-arc, arc-spiral-line and line-spiral-line 		

Post Processing Software	Bidder Complies	
	Yes	No
Profiles <ul style="list-style-type: none"> • Create Profiles: From surfaces, screen entities, points on centerline, etc. • Quick Profile: One step profile creation with real-time update while adjusting centerline • Input-Edit Profiles: Enter profile data in dual spreadsheet and graphic window, and design in reference to controlling profile grade points • Draw Profiles: Draws profiles on grids or plan-profile sheets with auto-updating based on edits • Profiles To 3D: Create points and 3D polylines from profiles 		
Points <ul style="list-style-type: none"> • Import/Export: User-defined import and export of point data along with conversions with specific other formats • Draw Points: Draw points with settings for symbols, layers and styles • Point Groups: Point group manager to define sets of point by filters • Coordinate File History: Tracks all changes to points with report and undo functions • Fix Point Label Overlaps: Finds point label overlaps with rule options to fix automatically • Point Tools: Utilities for modifying point labels such as move with leader, twist and resize 		
Area/Layout <ul style="list-style-type: none"> • Label Areas: Customized area label styles and several methods to select areas to label • Size Areas: Sliding side area, hinged area, area radial from curve and bearing area cutoff • Lot Network: Commands for subdividing a site into lot and ROW areas. Dynamically updates areas for any changes to boundaries. Includes ability to label linework and areas and to draw setback boundaries • Lot Manager: Lot definitions by point numbers with functions to create lots, conduct map check for closure, edit in spreadsheet with graphics, report lots and draw lots • Offsets, Parking, Intersection and Cul-de-Sacs: Layout for ROW and EOP linework 		
Annotation <ul style="list-style-type: none"> • Angle & Distance Labels: Flexible routines to label linework in all possible layout combinations plus available rules to automatically fix label overlaps and revise labels when entities move • Curve Labels: Label curve data in stack, along arc or in table • Survey Text: Routines to create typical plat labels such as offset and building dimensions • Linetypes: Draw special linetypes • Mapping Labels: Routines to create typical plat labels 		
3D Data <ul style="list-style-type: none"> • Elevate 2D to 3D: For spot elevation, polylines, contours and pads • Edit-Assign Polyline Elevations: Elevates 3D polylines using control points • 3D Polyline Tools: Draw, offset, fillet and merge 3D polylines 		
Surfaces <ul style="list-style-type: none"> • Build Surfaces: By triangulation or rectangular grids • Contouring: One step from 3D entities or from surface files • Triangulation Utilities: TIN math and offset, simplify and merge functions • Surface Manager: Change surface properties and data • 3D Surface Flyover: 3D viewer with vehicle to drive over surface or follow 3D path • Slope Analysis: Slope reports and zone analysis 		
Grading <ul style="list-style-type: none"> • Volumes: Earthwork volumes between triangulation or grid surfaces • Pad Design: Tie cut/fill slopes from pad perimeters • Cut/Fill Color Maps and Labels: Draw shaded red/blue map with labels • SiteNET: Organize surfaces by layer with subgrade adjustments 		

Post Processing Software	Bidder Complies	
	Yes	No
Sections <ul style="list-style-type: none"> • Create Sections: From surfaces, screen entities, points, etc. • Quick Sections: One step creation of sections • Draw Sections: In vertical stack or sheets • Input-Edit Sections: Enter section data in dual spreadsheet and graphics • Sections to 3D: Create points and 3D polylines from sections • Mass Haul: Diagrams and Analysis • Section Volumes: By end areas method 		
Software to be Carlson Office 2016 Suite with IntelliCAD (Civil, Survey, Hydrology, GIS) or equal		

BID FORM

W. E. Caffee
Assistant Purchasing Agent
Birmingham, Alabama

Submitted below is my firm bid for global positioning system surveying kit (software and hardware) for the City of Birmingham, in accordance with your invitation to bid and specifications dated October 17, 2016. Prices quoted are in exact accordance with specifications except as listed below.

Approx. Qty	Description	Make/Model Part Number	Total Price
1	GPS Surveying Kit as per specification (Base, rover, data collector, GPS data processing software, batteries, all hardware, all accessories, training and support)*		\$ /kit
1	Carlson Office 2016 Civil Suite with IntelliCAD (Civil, Survey, Hydrology, GIS) per seat with option to buy additional seats at bid price.		\$ /seat
GRAND TOTAL			\$
*Bidder must provide complete itemize listing of all items included in the kit along with price for each item.			

BID FORM cont'd

I hereby certify that we do not discriminate in employment of our personnel against any persons on account of race, creed, color, sex, or national origins, and acknowledge and agree that the City encourages minority and women-owned business participation to the maximum extent possible. This policy includes Historically Underutilized Business Enterprises such as architectural firms, engineering firms, investment banking firms, other professional service providers, and construction contractors as part of the City's business, economic and community revitalization programs.

Bidder acknowledges receipt of _____ addenda.
(addenda numbers)

This page must be returned with bid.

Date of Bid

Name (Print legibly or Type)

Company

Title

Street Address

Signature

City State Zip

Tax ID Number

Post Office Box (Zip if different from street address)

E-Mail Address

City State Zip

Telephone Number

Terms of Payment

Fax Number

Delivery Date

Website

IF AVAILABLE PLEASE SUBMIT COPY OF CURRENT CITY OF BIRMINGHAM BUSINESS LICENSE WITH THIS BID.

INDICATE THE FOLLOWING ADDRESSES IF DIFFERENT FROM ABOVE:

- 1. BID AWARD NOTICE ADDRESS**
- 2. PURCHASE ORDER ADDRESS**
- 3. REMITTANCE ADDRESS (and NAME if different than above)**