

City Of Torrington

ENGINEERING DEPARTMENT
(860) 489-2234



140 Main Street • City Hall
Torrington, CT 06790-5245
Fax: (860) 489-2550

MEMORANDUM

To: Honorable Mayor Elinor Carbone and City Council Members

From: Paul Kundzins, P.E. - Deputy Public Works Director / City Engineer

Date: February 18, 2020

RE: Contract Award: Purchase And Set-Up Of Robotic Total Station & Survey Grade GPS Receiver System – RGS-027-012820

I respectfully request City Council accept the recommendation of the Deputy Public Works Director / City Engineer to authorize the Mayor to act on the behalf of the City regarding the award and execution of the purchase of a Robotic Total Station & Survey Grade GPS Receiver System.

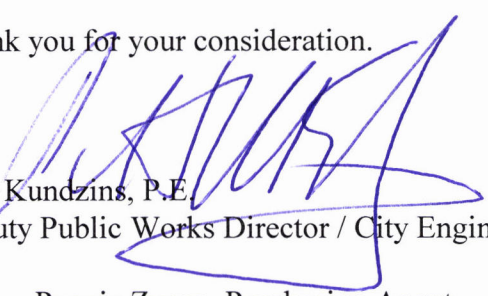
A price summary showing all bids received is enclosed. Upon review of all bid submittal documents, **Waypoint Technology Group LLC of Albany NY**, although not the lowest bidder, was determined to meet all bid specifications. The other three qualified bidders did not meet all the bid specifications.

I recommend the Mayor award this purchase to **Waypoint Technology Group LLC of Albany NY** for the amount **\$48,063.33**.

This purchase will greatly improve the survey data collection for the Pavement Management Program Road Reconstruction design process for the Engineering Department, by increasing productivity and reducing labor costs.

The purchase is funded by the City of Torrington Pavement Management Program Bond Fund.

Thank you for your consideration.


Paul Kundzins, P.E.
Deputy Public Works Director / City Engineer

cc: Pennie Zucco, Purchasing Agent
Ray Drew, Public Works Director



City of Torrington

Bid Name Robotic Total Station + GPS Receiver System Bid Number RGS-027-012820
Date of Opening 1/22/2020 Time of Opening 11:00am

VENDOR	BID BOND	NON-COLLUSION	BID AMOUNT	ADDENDUM
Bridger Equipment Technology 330 Limestone Blvd. Middlesex, NJ 08846	Bank OK \$2650-	✓	\$53,000	#1 ✓
Superior (SPDI) Box 57 Middletown CT 06447	Bank OK \$1540.12	✓	\$30,802.41	#1 ✓
Maine Technical Source 727 Seigeant Palmateer Way Whippings Falls, NY 12590	N/A	N/A	\$42,688.98	#1 ✓
Waypoint Technology Group 17 Computer Drive East Albany, NY 12205	Bank OK \$2,403.17	✓	\$48,063.33 (48,063.33)	N/A
Topcon Solutions Store 222 Murphy Road Hartford, CT 06114	N/A	✓	\$43,911.90	#1 ✓
Monroe Tractor c/o Sandra Orr South Windsor, CT 06074	✓	✓	\$44,500-	#1 ✓

	Binder Equipment Technology LLC	Superior Products Distributors, Inc.	Waypoint Technology Group	Monroe Tractor
Bid Amount	\$53,000.00	\$30,802.41	\$48,063.33	\$44,500.00
Robotic Total Station				
Electromagnetic Direct Drive with Integrated servo/angle sensor	NO	NO	YES	NO
Servo driven, endless fine adjustments	NO	YES	YES	NO
2.4 GHz Frequency Hopping, Spread Spectrum Radios	NO	NO	YES	NO
Distance accuracy in prism mode (ISO) Standard - 1mm+2ppm	YES	NO	YES	YES
Distance accuracy in prism mode (RMSE) Standard - 2mm+2ppm Tracking 4mm+2ppm	YES	NO	YES	YES
Multi-Track technology	NO	NO	YES	NO
Multi-Track Target	NO	NO	YES	NO
Network Rover / Antenna				
Simultaneous satellite signal tracking of GPS (L1C/A, L1C, L2C, L2E, L5), GLONASS (L1C/A, L1P, L2C/A, L2P, L3), SBAS (L1C/A, L5), Galileo (E1, E5A, E5B), BeiDou ((COMPASS) B1, B2)	NO	YES	YES	NO
SBAS: QZSS, WAAS, EGNOS, GAGAN	NO	YES	YES	NO
Maxwell 6 Custom Survey GNSS Chips with 440 channel minimum	YES	YES	YES	YES
Fully Integrated, Fully Sealed 2.4 GHz Bluetooth Communication port	YES	YES	YES	YES
Minimum Real Time Kinematic Surveying Network RTK Accuracy: Horizontal 8mm+0.5ppm RMS, Vertical 15mm+0.5ppm RMS	YES	YES	YES	NO
360 Tracking Technology	NO	NO	YES	NO
RTK reference station network access including unlimited baselines	YES	YES	YES	YES
Raw data logging option	YES	YES	YES	YES
Field Controller/Data Logger				
A ruggedized field controller/data collector running Microsoft Windows Embedded Handheld 6.5 Professional Operating System.	YES	YES	YES	YES
At minimum, a VGA touch screen display, sunlight readable and backlit	YES	YES	YES	YES
At minimum, 8 gigabyte internal flash memory	YES	YES	YES	YES
At minimum, a 800 MHz processor with 256 megabyte RAM	YES	YES	YES	YES
At minimum, 1 USB connector	YES	YES	YES	YES
USB connector cable	NO	NO	YES	NO
At minimum, integrated Bluetooth 2.0+EDR, integrated Wi-Fi 802.11 b/g	YES	YES	YES	YES
Field controller/data collector software loaded	YES	YES	YES	YES
At minimum, integrated 5 megapixel camera that takes pictures with embedded horizontal coordinates in digital format	YES	YES	YES	YES
AC power supply	NO	YES	YES	NO
Field Controller/Data Logger Software				
To include at minimum, job, data and coordinate management functions	YES	YES	YES	YES
Data import and export of survey and engineering standard file formats	NO	YES	YES	NO
At minimum, map view within jobs	YES	YES	YES	YES
Field to office data transfer	YES	YES	YES	YES
Stake out of points, DTMs, alignments, polygons and ploylines	NO	YES	YES	NO
COGO computations	NO	YES	YES	NO
Road stake out, offset stake out	YES	YES	YES	YES
Measure and compute surfaces, volumes, and boundaries	YES	YES	YES	YES
Antenna Pole and Accessories				
Telescoping Carbon Fiber rover pole, circular bubble, and snap lock at 2 meters	NO	YES	YES	NO
bipod for rover pole/range pole	NO	YES	YES	NO
Field Controller/Data Logger Bracket for connection to pole	NO	YES	YES	NO
Topo shoe and Point	NO	YES	YES	NO
Minimum 2.6m Telescoping Rod	NO	YES	YES	NO
Composite Tripod with Dual Lock System	NO	YES	YES	NO
Batteries and Charger				
2 sets of rechargeable batteries each for Robotic Total station, GPS antenna and field controller/data logger,	NO	NO	YES	NO
Battery charger	NO	YES	YES	NO
Other				
All other Equipment not listed above but necessary for efficient operation of the unit.	NO	YES	YES	NO
All operation and parts manuals for proposed equipment	NO	YES	YES	NO

- Meets or Exceeds Bid Specifications
- Does NOT Meet Bid Specifications

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MEMORANDUM

To: Honorable Mayor Elinor Carbone

From: Paul Kundzins, P.E. - Deputy Public Works Director / City Engineer

Date: May 11, 2019

RE: Purchase of Robotic Total Station Survey Equipment

I respectfully request that the City consider the purchase of a one-person Robotic Total Station Survey system for the Engineering Department. This equipment is extremely efficient and cost-effective compared to the existing two-person conventional Total Station Survey system the City currently uses.

This new equipment will greatly improve the survey data collection process for the Engineering Department, by increasing productivity by 300% and reducing labor requirements by half. Comparing the cost of operating both systems over the life of the bonding paving project (to rebuild 22 miles of roads), the cost of purchasing and operating the new equipment is less than half the cost of operating the existing equipment.

The attached supporting information details the advantages and cost savings.

Thank you for your consideration.

Paul Kundzins, P.E.
Deputy Public Works Director / City Engineer

cc: Alice Proulx, Comptroller
Ray Drew, Public Works Director

Summary Information Sheet

Robotic Total Station Survey Equipment

The Engineering Department uses survey equipment to accurately collect data and record the location and elevation of street features that are used in the design of street reconstruction. This information is used to design the new street and determine quantities of materials. Accurate material quantities and precise street design information allows contractors to bid projects with confidence resulting in cost effective pricing. Having a clear and accurate design increases the accuracy of cost control and reduces the risk of the unknown for both the City and contractor.

Robotic total station survey with GPS capability allows for efficient and fast data collection of street features by one person. The robotic instrument automatically tracks the rod man in real time vs a person operating the instrument manually using an optical telescope. The data is entered into the collector by the rod man at the required location vs the instrument man being hundreds of feet away communicating by two way radio.

The same data collector is used for both total station and GPS equipment allowing for data to be stored in one device that can be interchangeably used for each operation as needed.

Advantages:

- One person operation
 - Robotic Total station (RTS) is a one person operation
 - Traditional total station (TS) is a two person operation
 - Instrument man and rod man
 - Cost savings
 - Efficient use of human resources
- Increased productivity
 - No communication between crew
 - No need for using two-way radios
 - Eliminates time for confirming data of each reading
 - Automatic tracking
 - Eliminates time for person to use instrument to optically sight and locate rod man and then take reading (for Robotic system this is all automatic)
- Daily production
 - Robotic system is twice as productive
 - Two man TS crew - Average 250-400 points per day
 - One man robotic - Average 600-1500 points per day
- Uses current GPS Technology
 - Existing GPS equipment (controller computer processor) is outdated and slow to process satellite data and has poor reception
 - Results are inefficient, with slow and delayed operation during loss of lock
 - New GPS controller has new technology in computer processor for efficient and fast reception to connect to satellites.
 - Allows for continuous workflow in poor reception areas.
 - Incorporates new Satellite constellations increasing accuracy and performance.

Cost Savings Summary

Cost savings of purchasing Robotic total station for bonding road project

During the first phase of the bonding project we surveyed 16 roads for a total of 4 miles using a 1 man crew and a robotic total station. This survey took 19 days to complete. During this time we averaged 1100 shots per day. This works out to about 5225 shots per mile of road. Over the remainder of the bonding road project we have 22 more miles of road in need of survey. This equates to approximately 114,950 more shots. With a robotic total station and 1 man crew this could be accomplished in approximately 104 days. With a conventional total station we would need a 2 man crew and would average about 325 shots per day. This would require about 354 days to complete the survey. If we use a pay rate of \$35.35 for a grade 10, our manpower cost for surveying the rest of the project with a robotic total station would be approximately \$29,411, while our manpower cost with a 2 man conventional crew is approximately \$200,222. Adding the cost of a new robotic total station of approximately \$50,000, using the robotic total station for the remainder of the bonding road project, we save approximately \$120,811 over using the conventional system.

	Crew	Average Shots per day	Man-hours to Topo Remaining 22 Miles	Manpower Cost to Topo Remaining 22 miles	Cost of equipment	Total Cost to Topo Remaining 22 miles
Robotic Total Station	1	1100	832	\$29,411*	\$50,000	\$79,411
Conventional Total Station	2	325	2,832	\$200,222*	\$0**	\$200,222
Total Cost savings over the Bonding Road Project						\$120,811***

* Pay Grade 10 employee

(includes FICA and W.C., does NOT include insurance or other benefits)

** Using outdated equipment already owned by the department

*** Does not take into account the cost savings and value of the robotic total station beyond the scope of the bonding road project