

5/29/15

**ADDENDUM NO. 1
to the
Iowa Department of Transportation
Proposal No. 14436
For Remote Hydrographic Survey Boat
Letting Date: June 10, 2015**

Notice To Bidders:

This Addendum is issued to incorporate the following additions, deletions, corrections, and/or clarifications to the terms or specifications and shall hereby be considered a part of the final contract documents. This Addendum shall supersede, modify and/or change all statements to the contrary in the bid proposal and shall take precedence over previous terms or specifications.

CHANGE:

The DOT has made some revisions to the specifications. Please see attached and note the updates highlighted yellow.

All Bidders must sign and return this Addendum for the bid opportunity referenced above. Failure to do so may subject the Bidder to disqualification. If a bid response has already been submitted, this Addendum shall be signed and emailed or faxed to the Purchasing Section prior to the scheduled Letting Date.

Company Name (*please print*)

Date

Signature

Sincerely,

(Name), Purchasing Agent (Title)
Phone No. 515-239- (XXXX) Fax No. 515-239-1538
(Name)@dot.iowa.gov

Title

Equipment Specifications: Remote Hydrographic Survey System

Introduction

The purpose of this equipment is to collect engineering survey accurate data from a remote controlled (unmanned) platform equipped with a system of advanced survey technologies for hydrographic/bathymetric data collection and specifically bridge scour evaluations. This type of system generates a detailed 3-dimensional electronic map of the "floor" of a body of water, including rivers, streams, and lakes, accurately defining the depths and shapes of underwater terrain.

The remote hydrographic survey system shall incorporate the following integrated field capable (ruggedized) technologies:

- Real Time Kinematic (RTK) Global Navigation Satellite System (GNSS) Receiver: This receiver uses satellite navigation in real time from a system of satellites that provide autonomous geo-spatial positioning with global coverage. This allows the receiver to determine the location (longitude, latitude, and altitude) to high precision using time signals transmitted along a line of sight from satellites.
- GNSS Antenna: The antenna boosts the reception signal to a GNSS receiver.
- Singlebeam Echosounder: An echosounder capable of making very accurate depth measurements recording high resolution full water column acoustic envelope which will result in a highly detailed representation of the bottom of a body of water.
- Radio Modem: Real-time data transfer provided by a radio modem with multiple channel wireless communications over long distances (1500ft. minimum) allowing instrument data to be logged by computer on shore. Wireless connectivity for linking with external hardware.
- Hydrographic Data Acquisition and Processing Software
- Remote Controlled Boat and Dual Motors

System Component Specifications

All Components

All components must have full interoperability.

Certified to meet or exceed industry vibration and shock standards.

Certified to meet or exceed industry watertight and dustproof enclosure standards.

Operating Temperature 32°F – 105°F

Storage Temperatures -10°F to 130°F

Dust and Water Protection IP65 minimum ([Ingress Protection](#): Meet or exceed industry dust tight standards and meet or exceed industry watertight standards with temporary submersion to 1 meter minimum.)

Shock Rating Meet or exceed industry shock standards with a minimum of being able to withstand a 5 ft drop on a hard surface (IEC 60068-2-27)

Humidity 95% non-condensing

Boat

Physical:

Hull Length (Stability Issue)	Range: 4ft – 6.5ft
Hull Width (Stability Issue)	Range: 1.5ft – 4ft
Access Hatch	Fully water tight
Total Weight (Fully Equipped)	80lbs maximum
Payload	All components (except antennas and GNSS antenna and receiver) mounted inside the water tight boat
Payload Capacity	40lbs – 65 lbs
Hull Material	UV Resistant

Remote Controls (navigation & power):

Navigation Remote Control Range 1500 ft ~~3500 ft~~ minimum

Propulsion Performance:

Motor Type	Electronic (battery operated)
Rechargeable Internal Battery	8 hr operation per charge
Typical Survey Speed	4 ft/sec – 6 ft/sec
Top Speed	15 ft/sec maximum
Battery Endurance	2 hr minimum

Single Beam Echosounder

Examples: [Sonarmite](#) and [CEE HydroSystems CEEPULSE](#)

Power:

Rechargeable Internal Battery	8 hr operation per charge
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Physical:

Connectors	LEMO 1K
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Data Output:

Output Formats	NEMA and ASCII (minimum)
I/O	Bluetooth and Serial

Echosounder:

Mode	Automatic and Manual
Frequency	Range: 190 kHz – 210 kHz
Accuracy	0.01 m +/- 0.1% of depth
Beam Width	4°min to 9° max
Depth Range	1ft – 100 ft
Sound Velocity	1350 – 1750 m/s
Ping Rate	5-20 Hertz

Real Time Kinematic (RTK) Global Navigation Satellite System (GNSS) Receiver:

Examples: [Topcon GB-3](#) and [Hemisphere A325 \(or S320\)](#)

It is acceptable for the GNSS receiver and GNSS antenna to be in the same housing and for that system to be outside the compartment of the boat, provided the system meets the water protection standards included in these specifications.

~~The GNSS receiver is to be separate from the GNSS antenna so that the receiver can be housed within the sealed boat.~~

The receivers must be able to receive real time network corrections within the Iowa DOT statewide Real Time Network (RTN) or from a GNSS base station to perform real time kinematic survey operations.

Maximum system accuracy requirements:

Static	0.5 cm + 0.5 ppm (Horizontal) 1.0 cm + 1.0 ppm (Vertical)
RTK	1.0 cm + 1.0 ppm (Horizontal) 2.0 cm + 1.0 ppm (Vertical)

Receiver Type: Dual frequency (L1 and L2) Global Navigation Satellite System (GNSS) receiver

Signals Tracked/Received: GPS and GLONASS minimum (Capable of tracking L2c, L5 and Galileo signals)

Data Format: (Capable of receiving data transmitted in these message formats) CMR+, RTCM 3.0, or RTCM 3.1, RTCM SC104, CMR, CMR+, ASCII Output NMEA 0183 version 2.x and 3.0

I/O Communications: USB, Serial and RS 232 (1 each minimum)

Bluetooth Communications: Integrated Class 2

Channels: 72 minimum (capability of tracking at least 24 satellites simultaneously)

Cold Start Time: Maximum time to first measurement of 60 seconds, and less than 5 seconds maximum to subsequent measurements

Variable Position Update Rate:	0.05 seconds to 60 seconds
Position Latency:	0 .03 seconds or less
Cellular Communications:	Capable of receiving corrections from the Iowa Real Time Network or a local base station via cellular modem.
Modem:	CDMA (Code Division Multiple Access)
Data Rate (Update & Output):	1Hz – 100 Hz Selectable
Memory:	Removable SD/SDHC Memory Card (32GB min.) 256 MB onboard data logging storage, using either internal memory or removable data card
Rechargeable Internal Battery:	8 hr operation per charge (or 2 sets of 4 hr batteries)

Real Time Kinematic (RTK) Global Navigation Satellite System (GNSS) Antenna:

Examples: [Topcon G3-A1](#), and [Hemisphere A42](#)

Sub-millimeter antenna phase center stability

Built in ground plane

Operating Frequency Range:

L1 GPS/GLONASS	1586.5 ± 25 MHz
L2 GPS/GLONASS	1236 ± 20 MHz
L5 GPS	1176 ± 12 MHz

Radio Modem:

The system is required to have a low wattage radio connection for times when cellular communications are not available.

Fully compatible with the operations of the GPS receivers.

Accepted and certified for operation in the United States.

Maximum 35W RF output radio with an external 50 ohm antenna

Hydrographic Data Acquisition and Processing Software

Example: HYPACK, Inc.

Auxiliary Equipment:

Prism and prism boat mount (required for total station operations)

DC and AC chargers for all equipment

All necessary electronic cables for connecting the various components

Rugged carrying case for each of the system components

2 – extra onboard component batteries per device

110 volt wall charger for all the component batteries

12 volt DC automobile charger for all component batteries

1 – deep cycle marine battery replacement

Manuals or CD's containing the manuals

A 2 year parts and service warranty