From: spo
Sent: Wednesday, November 09, 2011 3:00 PM
To: spo
Subject: SPO ALERT - Focus Group Meeting - Rebid of Solar Powered Programmable Message Signs Contract
Attachments: 01 Specifications.doc

SPO ALERT

Date: November 9, 2011

To: State Agency Chief Procurement Officers, Cooperative Program Membership

From: SPO on behalf of the Arizona Department of Transportation

Re: Rebid of Solar Powered Programmable Message Signs, T0759A0004

ADOT Procurement will be holding a focus group to rebid the solar powered programmable message signs contract T0759A0004.
Please bring any requirements you would like to discuss at this meeting.

- Date: Thursday – November 17, 2011
- Time: 9:00 A.M. - 11:00 A.M.
- Location: ADOT Procurement - 1739 W. Jackson, Modular A - Procurement Conference Room

Attached are the current specifications for your review.

R.S.V.P to Gary Henry at ghenry@azdot.gov by Wednesday November 16, 2011.

SPO ALERTS are available
online at http://spo.az.gov

SECTION 1
SPECIFICATIONS

ARIZONA DEPARTMENT OF TRANSPORTATION
Procurement Group
1739 West Jackson Street, Suite A, Mail Drop 100P
Phoenix, Arizona 85007-3276
Phone: (602) 712-7211

SOLICITATION NO. ADOT12-00001240

1. PURPOSE

Pursuant to the Arizona Procurement Code, A.R.S. §41-2501 et seq., the State of Arizona Department of Transportation (ADOT) here into referred to as the Department, has a requirement for a term contract for the procurement of solar powered programmable message boards. This Invitation for Bid (IFB) is to establish a contract with a company(ies), herein referred to as the Contractor. This Specification is intended to describe and set minimum acceptable standards for (not to design) trailer mounted solar powered programmable message boards.

2. REFERENCES

General List of Documents Incorporated by Reference in ADOT Specifications

Arizona Criminal and Traffic Law Manual is available through LEXIS Law Publishing, P.O. Box 7587, Charlottesville, VA.

Environmental Protection Agency (EPA) publications are available through the National Service Center for Environmental Publications, P.O. Box 42419, Cincinnati, Ohio.

Federal Highway Adminstration Manual on Uniform Traffic Control Devices (MUTCD) is available through the Government Printing Office (GPO), Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA .

Federal Motor Vehicle Safety Standards (FMVSS) are found in Code of Federal Regulations (CFR), Title 49, available through the Government Printing Office (GPO), Superintendent of Documents, Washington, D.C.

National Electrical Manufacturers Association (NEMA) Standards are available through Global Engineering Documents, 15 Inverness Way East, Englewood, Colorado.

Occupational Safety and Health Administration (OSHA) Standards are available through the Technical Data Center, U.S. Department of Labor, Washington, D.C., and through Regional Offices of the Occupational Safety and Health Administration.

Society of Automotive Engineers (SAE) Standards are available through the Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA.

The Maintenance Council (TMC) Recommended Practices are available through the American Trucking Associations, 2200 Mill Road, Alexandria, VA.

2. ITEMS

The equipment supplied shall be as specified consisting of all the materials and fabrication services necessary to provide the Department with the individual pre-assembled signals so they are ready for installation in the field. All materials and assemblies shall meet or exceed the requirements stated herein and shall conform to the applicable Department requirements referenced.

1. Solar Powered Programmable Message Boards

The equipment shall be a standard model of a manufacturer with experience in the production of programmable message boards, equipped as necessary to meet the requirements of the Specification. All workmanship and materials shall be of good quality and design. All equipment shall be identical in all aspects of design and manufacture.

3. GENERAL REQUIREMENTS

The equipment shall conform to all applicable FMVSS, OSHA, EPA and Arizona MVD regulations and to all NEMA and other industry standards in effect at the time of delivery.

All dimensions, weights, wire or metal gauges, or other factors expressed numerically in this Specification are to be considered as nominal (+/- 10%) requirements unless indicated otherwise by the words "Minimum", "Maximum", or "Exactly". Where brand names, with or without arrangement numbers, are mentioned, it is to be understand that brand name or equal is intended.

In all instances where the Specification requires lockable enclosures or compartments, if the contractor installs cylinder type locks, all locks shall be keyed alike and three keys shall be supplied with each unit. If padlock receptacles are installed, ADOT will supply padlocks.

The equipment shall be capable of operating independently from the sun for 30 days (minimum).

The equipment will be used statewide at elevations from near sea level to 10,000 feet and in ambient temperatures ranging from -30 to 120 degrees F. The equipment will also be used in rain, snow, blowing dust and other inclement weather. All components of the equipment shall remain operational under these conditions.

4. TECHNICAL REQUIREMENTS

Message Board

The message board outer framework/cabinet shall be fabricated to the following nominal dimensions:

1. Length - 107 to 135 in.
2. Height - 65 to 80 in.

The front sign face shall include clear UV inhibited polycarbonate or lexan cover(s), angled downward 7° from vertical to reduce glare and to minimize the “neutralizing” effect of direct sunlight on the LED’s. If pixels are epoxy encapsulated to prevent moisture encroachment, polycarbonate or lexan cover(s) are not required.

Three lines of eight characters each shall be housed in a weather tight housing. The message characters shall be amber LED’s operating under the control of a digital computer / controller. Systems utilizing “flip disk” technology will not be considered. Character formation system and components shall conform to the following requirements:

1. Characters: 35 individual pixels of four LED’s each.
2. The 35 pixels shall be arranged in a seven pixel high by five pixel wide matrix.
3. Character height: 18 in.
4. Line spacing: 5 to 6 inches from the adjacent line.
5. Horizontal character separation: 3.25 to 4.25 inches.

Speed of actuation shall be such that a complete change of all three lines of message copy is achieved in not more than 100 milliseconds.

The programmable message board shall be capable of displaying three lines of message copy, with eight characters per line, in various alpha-numeric combinations. The message board shall be programmable by the operator to display multiple messages in sequence at variable timed intervals. The message board shall also be capable of displaying moving arrow patterns as one of the operator selected programs.

The message board shall include the capability to default to a blank screen when a low battery condition is detected.

The message displayed on the board shall be clearly visible from a distance of 1000 ft. in both day and night conditions. The message displayed shall have a horizontal angle of vision of 20 to 30 degrees (total) and a vertical angle of vision of 10 to 20 degrees (total). A sighting device shall be installed that will allow the operator to position the message board perpendicular to a specific traffic point for maximum visibility.

Computer Control System

The programmable message board shall be controlled in all functions by an on-board menu-oriented microprocessor based computer/controller that will:

1. Include a hand held controller capable of entering and manipulating data.
2. Include an LCD display screen for writing and reviewing messages prior to display on the message board.

3. Store 200 or more pre-programmed messages for display (Printed plastic/paper labels inside of the control cabinet shall list all pre-programmed messages.)
4. Store 50 or more messages originated by users.
5. Maintain a menu (stored messages list) under programming enabling an operator to review and/or use any stored messages or sequence.
6. Provide program control that will sequence messages automatically at programmed time intervals.
7. Provide control for moving arrow displays.
8. Provide control to flash (blink) any or all message lines.

All operating characteristics of the computer/controller and software, including methodology, log on security, message creation, message selection and message display, shall be simplified to enable field personnel without prior computer experience to learn to operate the computer system over the full range of capabilities after a reasonable amount of training.

The computer, hand held controller, switches, controls and indicators shall be installed in a weather-proof, vandal proof, shock and vibration resistant housing to protect the working control station for the entire unit. The computer/controller shall be securely attached in the control center cabinet. A computer/controller that is readily removable is not acceptable. Also, the installation of foam rubber products for shock/vibration control is not acceptable.

Provisions shall be included to ensure that adequate lighting is available at the keyboard/terminal for night time operation without the use of auxiliary lighting.

All controls and/or devices placed in the control station enclosure shall remain operational in conditions when the temperature may exceed 160 degrees Fahrenheit within the enclosure.

Power and Miscellaneous Requirements

Electrical power shall be generated by solar photovoltaic panels charging the system batteries. The solar panels shall be made of single crystal solar cells for efficiency and longevity; not polycrystalline cells.

Six 4.4 amp @ 17 volts cells connected to produce 26.4 amps @ 17 volts.

Voltmeter instrumentation shall be installed. Ammeter shall be installed for both the solar charge circuit and 110 volt AC power source charging circuit.

Batteries - 6-volt Deep Cycle, low maintenance type batteries shall be installed in a weather resistant housing. All batteries shall be mounted on full-size rubber isolation pads to prevent plate damage from vibration during towing.

A built-in battery charger shall be installed; capable of recharging the completely discharged battery bank within 12 hours.

Provision shall be included to enable the sign to be powered by standard 120 volt AC commercial electrical service.

Message Board Support Structure

The message board shall be mounted on a telescoping vertical column of tubular steel that raises and lowers the message board. The board column mount shall be designed to rotate the board for display and/or transport. The message board shall be able to rotate 360 degrees around the vertical axis.

A device shall be installed to lock the board in any rotated position. The locking device shall be adequate to hold the board in position in wind gusts to 80 MPH with outriggers deployed. The column locking device shall be applied by a lever mounted to the support framework on the back of the message board within 30 in. of the end of the message board. Design and installation shall ensure that the lever device cannot come in contact with either the back side of the display board or the tops of the battery compartments when raising or lowering the sign. The locking device lever shall be adjustable to take up for wear and slack.

A 6 in. (minimum) grab handle shall be bolted near the lower RH corner on the back side of the message board for control. Safety regulations require that all positioning/deployment functions must be accessible to an operator standing on the ground, while holding the end of the message board.

The message board shall be raised vertically 4 ft. by a hydraulic cylinder in the vertical column powered by an electric hydraulic pump. The board shall raise and lower without releasing the column locking device. Wiring to message board shall be guided and supported to protect against damage during raising and lowering. Normal board raising and lowering functions shall be accomplished through an electrical switch at the control station. Having to manually release hydraulic pressure to lower the board during normal operation is not acceptable.

A safety support pin shall be provided for positive support through the mast when the board is fully raised. The pin shall have a "D" type handle and be attached to the unit by a heavy duty chain (#4 machine twist chain or equivalent), and rest in a holster/holder when not deployed through the mast.

A restricted orifice shall be installed at the base of the cylinder to prevent an uncontrolled lowering of the board in the event of a hose or system failure. An auxiliary hand lever hydraulic pump shall be included for use in the event of failure of the electric hydraulic pump, with adequate space to operate the hand lever.

The bottom of the message board shall be 7 ft. above the ground when the board is in the fully raised position.

The message board shall rotate and lower to a longitudinal position for transport. A self-aligning positive retaining device, other than the caliper brake, shall retain the board in transport position.

Trailer Requirements

The carrier and operating platform for all components of the complete message board system shall consist of a trailer with a 2 X 4 in. structural steel tubing frame, or of structural steel tubing of equivalent strength to the 4 in. dimension of the specified tubing.

All joining shall be by continuous bead welds.

The trailer shall be designed for towing at highway speeds up to 65 MPH.

Axle, suspension system, wheels, and tires shall each be rated for loads equal to or greater than the weight of the complete unit, with 400 lbs. of miscellaneous operating items on board.

Documentation of ratings of individual components of the suspension system is required as a part of the performance under a resultant contract from this Specification.

An identical spare tire and wheel shall be mounted on a lockable spare tire carrier. If spare tire is mounted on carrier with nut(s), nuts shall be identical to the wheel lug nuts, removable with the same lug wrench. The spare tire must be removable from the trailer without the use of any tool other than the lug wrench.

A lug wrench fitting the lug nuts shall be mounted inside one of the lockable enclosures. A spring clip retaining device is preferred.

The spare tire carrier shall be located to avoid interference with any operating or transport function of the complete unit.

All tires and wheels, including spare tire and wheel, shall be balanced before delivery of the unit.

Fenders - manufacturer's standard fender and splash guard arrangement shall be included. Splash guards shall extend to within 8 in. of the ground in level tow position. Advertising on splash guards is not acceptable.

Electric brakes shall be installed. (Dico or equivalent).

The brake system shall provide for lock-up of the trailer brakes in the event of a trailer break-away.

Brakes shall be drum type, sized for total braking capacity equal to or greater than the GVW of the loaded trailer as specified.

The trailer shall be equipped with a leveling jack rated at 2,000 lbs. capacity installed at each of the four corners of the trailer. Jacks shall be screw type that swivel and stow in a transport position. Top handle jacks with locking pin and chain preferred. (Bulldog TWS158DTSFw/P & C or equivalent)

Minimum three (3) inches of clearance shall be maintained around the full arch of the jack handle when raising or lowering the jack to preclude injury to operator's hands. Jacks shall not interfere with lights and reflectors when in the stowed position.

The trailer shall be structurally adequate to withstand wind velocities of 80 MPH with all outriggers in place.

A 4-way level indicating device shall be placed on the trailer frame, in an area where personnel will not tread on the level.

Tail, stop, turn signal, license plate, identification, marker and clearance lights, along with required reflectors shall be installed in full compliance with FMVSS 108.

All light wiring shall be installed in conduit, fully protected against mechanical damage and the effects of weather and water.

A trailer electrical cable and connector compatible with towing vehicles in the ADOT fleet shall be installed, that extends two (2) ft. beyond the ball hitch. (Cole Hersee 1255, or equivalent, with cable protector and circuited to SAE J560 standards using 7-conductor jacketed cable per SAE J1067, utilizing a junction box with an internal terminal strip, located on the tongue).

An electrical plug holder (Cole Hersee "Stor-A-Way" 11750 or equal) shall be installed in an ADOT approved location.

If lights are attached by fastening devices, bolts, flat washers and self-locking nuts shall be used.

Lights shall be recess mounted or metal shielded, and include shock mounting and hard wiring. (Grote stainless steel preferred - Truck Lite Super 40 is acceptable).

Marker light and reflector requirements:

1. Four amber recessed or metal armored lights, one mounted on each side of each front corner or two amber lights may be installed in 45 degree angle notches; one in each front corner.
2. Four red recessed or metal armored lights, one mounted on each side of each rear corner or two red lights may be installed in 45 degree angle notches; one in each rear corner.
3. One identification light, consisting of a horizontal group of three recessed or metal armored lights, mounted on the rear as near as practical to the trailer centerline.
4. Reflectors applied to smooth, flat surfaces shall be reflective tape type (Peterson #491A & B491R).
5. Reflectors applied to rough or uneven surfaces, such as tread plate, shall be reflex reflectors with metal housings and be attached by bolts with flat washers and lock nuts, machine screws or pop rivets.
6. Four amber reflectors, one mounted on each side of each front corner.
7. Four red reflectors, one mounted on each side of each rear corner.

The trailer shall be equipped with a 2 in. ball type trailer coupler, adjustable in height from 21 in. to 25 in. (Bulldog #3B4H, or equivalent)

All hitch components shall conform to SAE J684 standards. Hitch bolts shall be Grade 8 bolts, with hardened flat washers and Grade C self-locking nuts.

Two separate safety chains equipped with latching hooks, conforming to SAE J684, shall be installed, that extend 2 ft. beyond the end of the trailer hitch. Safety chains shall be individually bolted to the trailer tongue with Grade 8 bolts; attachment by welding is not acceptable. Documentation of safety chain ratings is required as a part of the performance under a resultant contract from this Specification.

A retractable, screw type jack with a steel caster wheel, jack and wheel rated at 1,000 lbs. capacity (minimum), shall be installed on the trailer tongue. Jack shall include tubular swivel with pin and chain. (Bulldog TWL155W)

The trailer design must allow all hitching and unhitching to be performed by one person.

The load must be distributed so that at least 10%, not to exceed 15%, of the weight of the fully loaded unit is transferred to the towing vehicle.

Two 1-3/4 X 27 inch vertical pipe stands shall be installed to stow 12 traffic cones. Cones are 28 inches tall; 15 inches square at base and weigh approximately 10 lbs. each. Location shall be determined in conference with ADOT Equipment Services personnel during installation.

The equipment shall be cleaned to a rust-free condition, then primed and finish painted with manufacturer's standard color(s) in two separate operations.

All wheels, including spare wheel, shall be painted manufacturer's gloss white.

Vandalism and/or theft protection shall be provided for, but not limited to, the following:

1. The spare tire.
2. The computer/controller and all control station components.
3. The battery compartments.

All controls shall be labeled as to function and direction with engraved or machine stamped metal plates affixed with bolts/lock nuts or pop rivets. Printed plastic/paper labels attached by adhesives are permitted only for the required control center operating instructions, computer menu, legends, etc., inside of the control center cabinet.

Optional Equipment

Remote Control - Cellular Telephone Operation

This option shall allow the sign operator to monitor and update message displays with remote IBM compatible computer via modem. A cellular transceiver w/handset shall be supplied with each unit for which this option is specified. This option shall include a modem with MNP-10 protocol and baud rate of 1200/2400 for electronic data transfer.

Radar - Message Interrupt Option

This option shall allow the sign to display its normal sequence of messages. When radar trigger speed is exceeded, the unit will display a notice for a vehicle to slow down or display the vehicle's actual speed.

1. Radar beam width - 18° horizontal and vertical.
2. Speed range - 15 to 120 MPH.
3. Transceiver - RS232 X-band, long range

All required hardware and software necessary to fully integrate equipment options into the basic operating unit shall be included.

Wiring

Except in extremely unusual situations, wiring installed by a motor vehicle manufacturer subject to the Federal Motor Vehicle Safety Standards will be accepted by ADOT. When an ADOT Specification requires additions to or modifications of wiring installed by such a manufacturer, and on vehicles or units not covered by FMC, the following statements will prevail:

1. Wire used shall conform (minimally) to SAE J1292. Within SAE J1292, the wire used shall be (minimally) Type HDT (Heavy Duty Thermoplastic Insulated) as described in SAE J1128.

2. Wire sizes shall be appropriate to the current required by circuit loading. Wires subjected to mechanical stresses shall be, at minimum, 14 ga. wire.
3. The installation shall provide adequate protection against moisture encroachment into wires at connection points and also provide adequate mechanical protection from abrasion/contact damage.
4. Installation of wires in either metal conduit or full tubular loom will meet the above requirements for both moisture and mechanical protection as described above. Conduit or loom ends exposed to the elements must be appropriately sealed against moisture encroachment.
5. If loom is used, plastic loom is required. Asphaltic loom is not acceptable.
6. Installation of wires in split loom will be approved as mechanical protection only and shall be used only if the wires are continuous runs without internal connections.
7. Conduit or loom shall be secured to a supportive structure at effective intervals by metal or rubber-covered metal clamps attached by bolts or machine screws. Welding of clamps to a supportive structure is not acceptable. The use of plastic wire ties is not acceptable.
8. Installations with unprotected wires are not acceptable.
9. Holes through which wiring passes shall be drilled and fully grommeted. The use of split or sliced hose as grommets is not acceptable.
10. Terminals or connectors shall be sealed to the wire insulation by properly applied sealed (silicone type) heat shrink or other acceptable methods. Taping is not acceptable.
11. Terminal boxes shall be weatherproof, readily accessible and supplied with internal terminal strips.
12. Connectors or terminals providing positive retention shall be used. Spade connectors depending only on friction for retention are not acceptable. The use of wire connectors which could possibly cut the metal strands is not acceptable. The use of wire-nut type connectors is not acceptable. Crimping of connectors with tools other than those designed specifically for that purpose is not acceptable.
13. Automatic reset circuit breakers shall be installed in a common block. The use of fuses is not acceptable, except to protect computer and/or printed circuits.
14. Wires shall be identified as to circuit and function by either color coding or numeric marking corresponding to the wiring diagram provided.

Fastening Devices

Fastening devices shall be bolts/hardened flat washers/lock nuts or machine screws. The use of sheet metal screws is not acceptable.

The use of pop rivets and self-tapping screws as fastening devices may not be acceptable; use of these items should be PRE-APPROVED by ADOT.

Bolts shall be a minimum of Grade 5, unless engineering data is supplied to substantiate the use of lesser-grade bolts. Bolts shall be sized appropriately to the intended functions and supplied with same grade self-locking nuts and hardened flat washers. Bolts shall be of sufficient length so that when properly tightened, a minimum of two (2) threads shall protrude through the top of the lock nut. The use of Grade 8.2 bolts is not acceptable.

All bolts, except metric bolts, shall conform to SAE J429 and shall be traceable to a bolt manufacturer holding membership in the Industrial Fastener Institute (IFI). Metric bolts shall conform to SAE J1199. Markings indicating both grade and the identity of the manufacturer shall be visible on all bolt head.

Fastening devices shall be plated or coated for rust prevention.

Fastening devices installed by contractors shall conform to factory installed devices.

Material and Fabrication

All materials used for fabrication shall be new and unused.

The use of a cutting torch shall be limited to unavoidable situations. Edges cut by a torch shall be ground to a smooth finish prior to priming and painting.

The use of any process, such as welding or torch cutting, that is detrimental to strength, hardness, or any other engineering requirement, is not acceptable.

All structural welds shall be continuous bead welds. All structural welds shall exceed the yield strength of the base metal. Skip welds may be used only if permitted in specific areas by the Specification. In such cases, a MINIMUM 50% skip weld must be achieved to be acceptable. All welds shall be free of slag and spatter prior to priming and painting.

If more than one fabricated item is required, all shall be identical in installation, design, materials, dimensions and assembly. ADOT may require the contractor to submit dimensional line drawings for any fabrication.

Hydraulics

All hydraulic hose shall conform to SAE J517. At minimum, all pressure hydraulic hose shall conform to SAE 100R2, with a minimum of 4:1 safety factor. Return hoses shall conform to SAE 100R1. All hydraulic hoses shall be rated to exceed the hydraulic system operating pressure.

All hydraulic hoses shall have high pressure fittings, rated to exceed the hydraulic system operating pressure, that are swaged to the hose. The use of strap type hose clamps to attach pressure hose to a fitting is not acceptable.

All hydraulic hoses shall be properly and adequately constrained to preclude any possible chafing or other adverse wear conditions. Clamps used to constrain or restrain hoses shall have provisions to prevent wear of the hoses. The use of plastic tie straps that are not impervious to the effects of ultra-violet light are not acceptable.

Grommets shall be supplied to protect hoses from abrasion. Grommets shall be firmly secured to the supportive structure to prevent loss. The use of split or sliced hoses as grommets is not acceptable.

Hoses, pipe and all other components conducting hydraulic fluid shall be compatible with all common hydraulic fluids and shall require only standard petroleum based hydraulic oils of the proper viscosity, with standard industry additives for hydraulic system use. Hydraulic systems requiring special, exotic oils are not acceptable.

At minimum, schedule 80 pipe shall be used.

If applicable, the hydraulic oil shall be vented to the reservoir or a suction line. Venting to the atmosphere, other than at the reservoir, is not acceptable.

Loctite Hydraulic Sealant, catalog #545, should be used for sealant. Silicone sealant is not acceptable.

Hydraulic filters shall be a major brand, with replacements available from a minimum of three manufacturers. The contractor shall supply cross-reference source information with the parts manuals delivered.