General Specifications for Lighted Crosswalk Warning Equipment and Miscellaneous Materials, Rev 4

Lighted Crosswalk Warning Equipment and Miscellaneous Materials

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(Name of Agency) will receive bids for providing all materials, labor, transportation, insurance, testing, and documentation required for furnishing Accessible Pedestrian Equipment and Miscellaneous Materials as described in these Technical Specifications. Bid prices shall be good for one year after award of bid.

Time being of the essence the bidder shall make best effort to deliver the materials within the delivery times shown above upon the receipt of the delivery order for any item or group of items embraced within this bid.

All material shall be new and of good quality. All workmen fabricating products described within the Technical Specifications shall be skilled in their trades and all workmanship shall be of good quality. The Bidder guarantees the products or work to be free of defective materials or workmanship for a period of at least one (2) years from the date of final certificate of payment is approved by (Name of Agency).

Where the Technical Specifications refer to specific products of one or more manufacturers or vendors, such references designate the specific items comprising the base bid, and the base bid must be based on these specific products, however they are not intended to restrict competitive bidding. Substitutions for materials specified by name may be offered as a voluntary alternate. (Name of Agency) Project Manager shall decide if equivalent materials are acceptable. Whenever the word "APPROVED" is used in these Technical Specifications, it shall be interpreted as meaning approved specifically by (Name of Agency) Project Manager.

The Bidder and each of its subcontractors shall be responsible for the proper care and protection of all their materials until delivery of same is accepted by (Name of Agency). The Bidder shall be responsible for loss or damage for any reason what so ever until delivery is accepted by an authorized representative of (Name of Agency). The Bidders responsibility shall include the replacement of lost or damaged material to the (Name of Agency) delivery point within the time allotted for the delivery as defined in the contract schedule.

1) Quality of Materials and Equipment

The Specifications require that the materials and equipment furnished under this agreement be of high quality, manufactured and supported by reputable and qualified vendors. Where materials and/or equipment are designated in the Technical Specifications by mention of the manufacturer's name, make, brand, or model, it shall be considered as indicating a standard of quality, style, grade, or type. The Bidder's proposal shall include as a base bid, unless specifically exempted, materials and equipment so specified. If the Bidder's proposal is accepted, it shall be the obligation of the Bidder to furnish such materials and equipment unless substitutions are allowed by the acceptance of a voluntary alternate. For this specific Bid, catalog cuts and complete descriptive material must be submitted with the Bid. The submission shall consist of catalog cuts or other descriptive literature that includes the following:

• Physical descriptions of all equipment
• Technical descriptions of all equipment
This material shall be included in a bound binder labeled CATALOG CUTS, Lighted Crosswalk Warning Equipment, and Miscellaneous Materials Contract.

2) Technical Specifications – Lighted Crosswalk Warning Equipment and Miscellaneous Materials

The purpose of this bid is to seek a pricing for various equipment needed to provide for a complete comprehensive Lighted Crosswalk Warning System for mid-block crosswalks. (Name of Agency) envisions a system and/or compliment of components that will utilize a series of signal heads with light emitting diodes (LED) in durable housings which will be embedded in the roadway. The LED's shall flash, in a unidirectional manner, and act as a warning to approaching motorists that a pedestrian is in, or entering, the crosswalk. The system shall be capable of being activated by a push-button or automatically activated when a pedestrian passes through an activation zone breaking an optical beam. The system should also be capable of being a stand-alone solar powered system or a conventional AC powered system (AC to DC) with battery back-up.

The installed system shall comply with National Electric Code (NEC) Article 300, Chapter 7, Section 725-3 rated as "Low Voltage". The System shall be installed to manufacturers recommended specifications and conform to federal, state or local regulations. The system shall meet the requirements for In-Roadway Warning Light systems as found in the Federal Highway Administration MUTCD Section 4L standards. The system shall have the Enlightened 1™ flash rate, a tested, proven, and effective superior flash rate with U.S. Patent Number 6,384,742 B1 for Pedestrian Crosswalk Signal Apparatus – Pedestrian Crosswalk.

The parts and equipment needed listed above are further specified as follows:

3) Logic Control Device:

System Notification Capable, Remote Data Available: The system shall be able to automatically transmit system notifications to the board mounted 8-bit microcomputer by an interconnect RS 232 protocol. Usage data stored in the system microcomputer showing activation time and dates shall be accessible via the network. The system shall be able to transmit this data via RS 232 port.

The system shall include a logic control device designed to run all timing parameters, keep count of the number of valid activations received and monitor the system for basic faults. The logic device shall include a 2 line by 20-character LCD display. The device shall be capable of displaying messages to help

the user determine the status of the system. Messages are displayed on the screen based user selections. Either the onsite or remote user shall be able to view messages being displayed.

When triggered by a push button input, the unit will commence operation. A panel indicator shall indicate that the output is enabled. Run time shall be re-trigger able, meaning that if another button input is received while the system is in the run mode, the elapsed time function shall be reset to 0, and the count started over again which has the effect of extending the run time of the unit. The normal flash rate for the lamps will be set to 50-60 flash cycles per minute.

The device shall allow the user to modify the timing parameters for run time by using the LCD screen and the user buttons on the face of the device. User activations for crosswalk applications shall allow for the programming of run times from 1-99 seconds in duration. The device shall provide a minimum of one-10A circuit to drive the flasher circuit. The device shall also be capable of accepting replacement module for field upgrade of the software.

The logic control device software shall be capable of running diagnostics from a user push button located on the control panel or by a remote operator. During the diagnostic mode, the unit will display a message on the LCD screen indicating it is in this mode. The software shall also allow one input to be a manual override function for special event use in which continuous operation would be needed.

During manual override, the system shall display a message to this effect on the LCD screen so that the user is aware of the operational mode. For crosswalk applications, the unit shall be capable of incorporating time clock based operation of the flashers for applications such as school crossings. The software shall allow a basic program to be run that provides up to 3 on cycles per day. A data sheet on the device shall be included with the bid submission or the response shall be considered incomplete.

Enclosure:
The enclosure shall meet NEMA 6 standard with a fiberglass construction and have a lockable latch. The enclosure shall be white in color, measuring 19 5/8" height x 17 1/8" wide x 8 1/4" deep.

General Performance Specifications

Parameter	Value
Power consumption	1 watt (in standby mode)
Operating Temp	0°C to +50°C
Input Operating Voltage	120 VAC or 240 VAC
Input Current Protection	5A fast acting (2 pole circuit breaker)
Input Surge Suppression	3000 Joules per pole, 100,000 Amps
Output Operating Voltage	13.5 VDC to 15VDC
Output DC Load maximum	10 Amps
Enclosure Type	NEMA 6 Fiberglass w/ padlock latch
Enclosure Color	White (standard)
Enclosure Size	19” x 17” x 8”
Battery Backup	12AH SLA

4) Solar Power Source - Logic Control Device and Enclosure:

The system shall also have the capability to utilize a solar power such that it can be incorporated into the System to permit stand-alone operation. The system should maintain continuous operation between recharges for approximately three (3) days with automatic activation features and up to six (6) days without automatic activation. An appropriate enclosure shall meet the following criteria.

General Performance Specifications

Parameter	Value
Power consumption	1 watt (in standby mode)
Operating Temp	0°C to +50°C
Input Operating Voltage	17 VDC solar panel (peak sun)
Input Current Protection	10A fast acting circuit breaker
Input Solar Panel Power	80 watts @ 4.7A (peak sun)
Output Operating Voltage	13.5 VDC to 15VDC
Output DC Load maximum	10 Amps
Enclosure Type	NEMA 6 Fiberglass (padlock latch)
Enclosure Color	White (standard)
Enclosure Size	32” x 15” x 15”

5) In-pavement Lighting Fixtures and Mounting Bases

System Modules: Signal Head System 9

Model Construction:

The signal head module shall be uni-directional with a clear UV resistant acrylic “dove” prism installed in front of the LED modules. The signal head module shall be completely sealed thereby preventing moisture intrusion from the roadway or from internal condensation. There shall be a minimum of 16 LED lamps in the signal head module.

The in-pavement LED signal light source shall be visible above the roadway surface no less than by 1/8th inch and oriented towards approaching traffic. The signal head module shall be securely attached to the roadway base by 4 recessed stainless steel socket head ¼"-20 screws.

A watertight connector shall be installed at the factory which connects the sealed solid-state signal head module LED electronic components and the wiring cable to the IRWL system. The fixture shall operate on 12V DC.

The signal head module shall be fabricated from high strength reinforced fiberglass composite of polyurethane/nylon. The signal head module shall protrude no more that .5 inch above the roadway surface and the lighting fixture shall have a black finish.

Photometric Performance:

In-roadway lighting fixtures shall be light emitting diode (LED) type. The light source shall be amber AlInGaP, non-diffused LED lamps. The number of internal signal head module LED lamps shall be 16 and shall be visible a minimum of 400 feet in advance of the crosswalk**.**

The LED signal head module lamps shall flash at the Enlighten 1™ flash rate which meets or exceeds standards established by the Federal Highway Administration Manual on Uniform Traffic Control Devices, Section 4N.

General Performance Specifications

Parameter	Value
Visibility	± 20 °
Operating Temp	−20° to +80°C
Operating Voltage	9VDC to 15VDC
DC Current @ 12VDC	0.2 Amps
Avg Power Dissipation	2.5 Watts
Luminous Intensity	252,000 mcd
Material	Polyurethane/Nylon
Color	Black

6) Mounting Base Plates

a. Standard Composite

The mounting base plate shall be manufactured from high strength fiberglass composite material, 10 inches in diameter and 1.5 inch in height, black in color. The standard base plate shall be manufactured with Self Clearing Debris Free™ Design.

The signal head module shall be mounted into a base plate assembly with 4 recessed stainless steel socket head ¼"-20 screws, field installed and tightened to no more than 4 lbs torque. The installing contractor shall return to the site installation with in a two-week period to check the mounting screw tension and, if necessary, re-torque the mounting screw to the prescribed 4 lb torque pressure.

Each screw shall have thread lock, anti-seize compound applied to the threads in the factory. The steel base plate shall have a .75-inch diameter-cabling hole in the center of the base plate. The base plate shall contain a horseshoe shaped O-ring inserted into the signal head module lip shelf.

b. Steel Snow Blade Resistant:

The mounting base plate shall be manufactured from case hardened steel coated with a corrosion resistant gray colored marine grade epoxy steel primer. The steel base plate shall be 14 inches in diameter and 1.5 inch in height. The steel base plate shall be manufactured with Self Clearing Debris Free™ Design.

The signal head module shall be mounted into a base plate assembly with 4 recessed stainless steel socket head ¼"-20 screws, field installed and tightened to no more than 4 lbs torque. Each screw shall have thread lock, anti-seize compound applied to the threads in the factory. The steel base plate shall have a .75-inch diameter-cabling hole in the center of the base plate. The base plate shall contain a horseshoe shaped O-ring inserted into the signal head module lip shelf.

7) Conductors

a. In-Roadway Conductors:

In-roadway conductors for lighting fixtures shall be stranded #14 AWG, Type RHW (600 V power cables, 90°C dry, and 75°C wet). The In-roadway conductors shall be YEL, RED, and BLK in color. The in -roadway conductors shall be installed according to National Electric Code (NEC) Article 300, Chapter 7, Section 725-3 standards.

In-roadway conductors may be direct buried (No min. depth required per NEC). The in-roadway conductors for activation devices, pedestrian crossing or traffic symbol signs, and additional components shall be multi-stranded #18 AWG multi-conductor stranded, (7x26) bare copper conductors, PVC/Nylon insulation, overall Beldfoil® shield (100% coverage) with drain wire, PVC jacket. In-roadway conductors may be direct buried (No minimum depth required per NEC).

b. Non-In Roadway Conductors:

Non in-roadway conductors shall be stranded #18 AWG, Type RHH or RHW-2 (Type EPR/Hypalon 600-volt power cables, 90°C dry and 75°C wet), unless installed in conduit.

c. Conduit:

When required shall be type 1 or 3.

8) LED Enhanced Signage:

All signage shall comply with MUTCD standards. The signs shall be manufactured from minimum .08-inch high-grade aluminum coated with 3M Diamond Grade Reflective Sheeting, meeting, or exceeding, ASTM standards for Type III, IV, and IX sheeting.

Each LED module shall operate on 12 V DC and shall employ the Enlighten 1™ flash rate operating at a 50% duty cycle. Each LED module shall be placed in a metal conduit weatherproof housing and securely attached to the sign.

General Performance Specifications

Parameter	Value
Visibility	± 20 °
Operating Temp	−20° to +80°C
Operating Voltage	9VDC to 15VDC
DC Current @ 12VDC	0.5Amps
Average Power Dissipation	5 Watts
Luminous Intensity	250,000 mcd
Retro-reflective	Diamond Grade
Background Color	Fluorescent YEL/GRN

9) Activation Devices

a. Automatic Activation Bollards:

The automatic activation bollard units shall be constructed of a cylinder shape painted white anodized aluminum housing. The dimensions shall be 42" height x 8" diameter. Each bollard shall contain an infrared sender and receiver located near the base of the bollard.

There shall be an internally lit “courtesy” LED light diffuser housed in cast aluminum, white epoxy coated frame located in the upper section of the bollard. The cylinder head shall be manufactured from cast aluminum, white epoxy coated. The cylinder body shall be manufactured from extruded aluminum, white epoxy coated. There shall be an aluminum frame grill covering the central section of the bollard cylinder.

The infrared light beams within the bollards shall have a 60- foot wide sensing capacity between bollard pairs. To facilitate field adjustments, the infrared light beams are preset at the factory. Each bollard shall contain connectors capable of holding a light beam field adjustment buzzer.

b. Push Buttons – Active Push to Walk Buttons:

System shall also be capable of utilizing standard pedestrian operated push button to activate the system. For these installations, a pole mounted control box containing the push button and a row of four flashing amber LEDs would be placed near the entrance to the crosswalk. The LEDs indicate to the pedestrian that the warning system is active. This standard pedestrian activation push button device would be installed as recommended in the MUTCD. Push Button activation assembly shall include Amber LED lights.

General Performance Specifications

Assembly Size:	Height: 12 inches, Width: 5.25 inches
Assembly Color:	Green
Faceplate Size:	Height: 7.75 inches, Width: 5 inches
Faceplate Color:	Yellow Background w/ Black Lettering
Material:	Cast Aluminum
Faceplate Lights:	Amber, Light Emitting Diodes (LED)
Push Button:	ADA Compliant, 2 inch SS Mushroom w/shield & microswitch
Mounting:	Pole mounted per local height requirements

10) Manufacturer's System Assurance

Upon request, the manufacturer shall provide (Name of Agency) with a minimum of three test / evaluation study reports on the manufacturer's product conducted by independent agencies. Test/ evaluation study reports shall demonstrate the worthiness and effectiveness of manufacturer's system for assurance by (Name of Agency).