SP-092001
(New)

Iowa Department of Transportation

SPECIAL PROVISIONS

FOR

TRAFFIC SIGNALIZATION

Bremer County

Project No.
ESL-8190(623)- -7S-09

Effective Date
November 17, 2009

THE STANDARD SPECIFICATIONS, SERIES 2009, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

Section 2525.03 Traffic Signalization - Construction
A. General *(Add the following statement)*

5. Complete and forward to the Engineer three (3) copies of a list of unit costs for each item listed on the attached Schedule of Unit Prices by the preconstruction meeting. The sum of the costs for each item shall equal the total Contract Lump Sum price for the traffic signal installation(s). Unit costs will be used to prepare progress payments to the Contractor. The unit costs will also be used to establish the total cost for any Extra Work Orders related to traffic signal installation work items unless otherwise negotiated.

E. Controllers, Cabinets and Associated Equipment *(Replace the following sections)*

Replace all NEMA TS-1 requirements with NEMA TS-2

3. a. – e. Controller shall be a PEEK 3000E TS2, Type 2.

g. Conflict Monitor. *(replace first paragraph with the following)*
Provide a solid state conflict monitor within the cabinet external to and electrically independent of the controller and enclosed in a finished metal case. The monitor shall detect the occurrence of conflicting Green, Yellow or Walk indications and shall cause the signals to go into predetermined flashing operation with stop timing applied simultaneously should conflicts be sensed. The conflict monitor shall utilize liquid crystal displays providing four indicators, which display an active Red, Yellow, Green, and Walk input for each channel monitored. If the actual conflict has been cleared, a reset switch (front mounted) on the conflict monitor shall return the controller to normal operation when depressed.

6. Master-Secondary Controller *(replace the entire section with the following)*
Master controller shall be a PEEK M3000E.

F. Video Detection *(replace entire section with the following)*

1. General

This specification contains the minimum design and operation requirements for the video detection system (VDS). The VDS shall detect vehicles by processing video images and providing detection outputs to the traffic signal controller. The VDS shall include all equipment, materials and installation necessary for the satisfactory operation and maintenance of the system including cameras, processors, mounting hardware, cables and connectors, as part of the lump sum traffic signalization item. The VDS shall be installed as per the plans and manufacturer's recommendations.

2. Video Detection System and Processors

a. Processor shall be card rack mounted or located within camera. Shall be compatible with NEMA TS-1, TS-2 and Type 170 controllers and cabinets.

b. Shall be capable of the following:
- Shadow rejection without special hardware.
- Non-impaired operation under light intensity changes.
- Maintained operation during rain, fog, snow, etc.
- Anti-vibration, 5% rejection based on image change.
- Proper operation during sunrise and sunset.
- Ability to select direction of flow parameters.
- Ability to properly detect bi-directionally.
- Operate in presence mode with less than 4% error.

c. Shall have user-defined detection zone programming via a graphical user interface (GUI) using a monitor and mouse, or laptop computer. Detection zones shall be stored in non-

volatile memory. Monitor and mouse, or computer software shall be provided to Contracting Authority.

d. Shall comply with NEMA TS-1 environmental and physical standards with an operating temperature of -34 to +74 degrees C, and 0 to 95% relative humidity.

e. A factory certified representative from the supplier shall provide on-site VDS programming and testing.

3. Video Cameras

a. Shall have CCD image sensor with variable focus color or black and white lens providing 6° to 48° horizontal field of view.

b. Shall be equipped with internal thermostatically controlled heater and external sunshield.

c. Shall meet NEMA-4 or NEMA-6P environmental standards.

d. Camera cable(s) shall be as per manufacturer's recommendations, and shall run continuously without splices from the camera to the controller cabinet.

G. Signals

6. Pedestrian Push Button Detectors. ***(replace section with the following)***

Pedestrian push button detectors shall be piezo driven solid-state switch type.

L. Wireless Interconnect *(add section)*

1. General

This specification contains the minimum design and operation requirements for the wireless interconnect network to provide two-way data communication between the on-street master controller and local traffic signal controllers. All wireless interconnect components, including data transceivers, antennas, mounting hardware, software, wiring and connectors shall be furnished and installed as part of the lump sum traffic signalization item.

2. Data Transceiver

a. Shall utilize a license-free spread spectrum radio frequency (902-928 MHZ) with frequency hopping technology.

b. Shall be completely programmable by software. Software shall be furnished to Contracting Authority.

c. Shall have built-in diagnostics capabilities.

d. Shall be configurable as master, slave or repeater with store and forward capability.

e. Shall have user selectable power output levels between 0.1 and 1 watt.

f. Shall operate with input voltages between 6 VDC and 30 VDC.

g. Shall have an RS-232 interface with 115.2 kbps capability.

h. Shall have an operating temperature of -40 to +75 degrees C.

i. Shall have a receiver sensitivity of –108 to –110 dBm at 10^{-6} BER.

j. Shall be protected from power surges.

k. Shall be rack or shelf mounted in controller cabinet, and shall have connections for antenna, power and controller.

3. Antenna

a. Shall be capable of transmitting and receiving data between intersections.

b. Shall be mounted near the top of the signal pole nearest the controller cabinet, or as per plans. Engineer-approved mounting hardware shall be provided.

c. Shall connect to transceiver via appropriate cable from pole to signal cabinet in same conduit as traffic signal cable. Cable shall be concealed within a watertight connection at antenna.

M. Emergency Vehicle Preemption System – Sound Activated *(add section)*

1. General

This specification contains the minimum design and operation requirements for sound activated emergency vehicle preemption (EVP) systems. All EVP system components, including detectors, processors, preemption indicators (confirmation lights), wiring, connections and mounting hardware as needed to provide complete and functional EVP systems shall be furnished and installed as part of the lump sum traffic signalization item.

2. EVP System

a. Shall be activated by emergency vehicle siren, and capable of determining the direction of the approaching emergency vehicle. Siren type shall be programmable.

b. Shall be installed as per the plans and manufacturer recommendations.

c. Shall have a minimum detection range of 1000 feet.

d. Control panel shall have siren detection and preemption LED indicators, diagnostics display and manual preemption switches by direction.

e. Shall operate with 95 - 130 VAC input power for NEMA controllers, 24 VDC for Type 170 controllers.

f. Shall have event logging up to 4000 events, stored in non-volatile memory. Events logged shall include date, time, direction, siren type, and elapsed time of preemption.

g. Shall have an RS-232 interface.

h. Shall have an operating temperature of -40 to +75 degrees C.

i. Detector cable shall be continuous from detector to controller cabinet. Cable shall be #18 twisted pair minimum, and as per manufacturer recommendations.

j. Manufacturer representative shall provide system programming, testing and instruction to the Contracting Authority regarding system operation and maintenance.

k. System software and manual shall be provided to Contracting Authority.

SCHEDULE OF UNIT PRICES				
TRAFFIC SIGNALIZATION				
BREMER AVE TRAFFIC SIGNAL MODIFICATIONS				
WAVERLY, IOWA				
DOT PROJECT NUMBER: ESL-8190(623)--7S-09				
		TOTAL		**TOTAL**
ITEM	**UNIT**	**QUANTITY**	**UNIT COST**	**EXTENSION**
8-PHASE CONTROLLER, CABINET, AND ACCESSORIES	EACH	7		
WIRELESS INTERCONNECT	EACH	7		
MASTER SIGNAL CONTROLLER	EACH	1		
WIRELESS SIGNAL PREEMPTION WITH ANTENNAS, EQUIPMENT, CABLE, AND ACCESSORIES	EACH	8		
VIDEO DETECTION WITH 2 CAMERAS, PROCESSOR, AND ACCESSORIES	EACH	7		
EVP SYSTEM, SOUND-ACTIVATED	EACH	7		
PEDESTRIAN PUSHBUTTON WITH SIGN	EACH	24		
PRE-CAST CONCRETE HANDHOLES, 24" DIAMETER	EACH	7		
SIGNAL CABLE - 7c #14 AWG	LIN FT	1770		
SIGNAL CABLE - 5c #14 AWG	LIN FT	8250		
SIGNAL CABLE - 2c #14 AWG	LIN FT	3020		
EMERGENCY VEHICLE PREEMPTION CABLE	LIN FT	4430		
PREEMPTION INDICATION LIGHT CABLE - 2c #14 AWG	LIN FT	4430		
VIDEO DETECTION CABLE(S)	LIN FT	2050		
COMMUNICATIONS CABLE(S)	LIN FT	1030		
GROUND WIRE - 1c #6 BARE	LIN FT	2000		
TRACER WIRE - 1c #10	LIN FT	2000		
2" PVC, TRENCHED/BORED	LIN FT	1620		
CONTROLLER FOOTING	EACH	1		
ADDITIONAL PEDESTRIAN PUSHBUTTON SIGN (R10-3E)	EACH	2		
16" PEDESTRIAN SIGNAL HEAD, HAND/PERSON, COUNTDOWN, EXISTING MOUNTING BRACKETS	EACH	46		
	TOTAL SIGNALIZATION COST			