July 3, 2017

REVISION OF SECTION 614

ACCESSIBILE PEDESTRIAN SIGNAL

**NOTICE**

This is a standard special provision that revises or modifies CDOT’s *Standard Specifications for Road and Bridge Construction* It has gone through a formal review and approval process and has been issued by CDOT’s Project Development Branch with formal instructions for its use on CDOT construction projects. It is to be used as written without change. Do not use modified versions of this special provision on CDOT construction projects, and do not use this special provision on CDOT projects in a manner other than that specified in the instructions unless such use is first approved by CDOT’s Standards and Specifications Unit. The instructions for use on CDOT construction projects appear below.

Other agencies which use the *Standard Specifications for Road and Bridge Construction* to administer construction projects may use this special provision as appropriate and at their own risk.

**Instructions for use on CDOT construction projects:**

Use on projects having an accessible pedestrian signal.

Section 614 of the Standard Specifications is hereby revised for this project to include the following:

**DESCRIPTION**

This work consists of the construction of an accessible pedestrian signal at locations as shown on the plans.

**MATERIALS**

The Accessible Pedestrian Signal (APS) shall be an audible-tactile pedestrian signal system and shall consist of all electronic control equipment, mounting hardware, push buttons, and signs designed to provide both a pushbutton with a raised, vibrating tactile arrow on the button as well as a variety of audible indications for differing pedestrian signal functions.

The APS shall meet the following requirements:

1. 2009 Manual of Uniform Traffic Control Devices (MUTCD), Chapter 4E – Pedestrian Control Features.
2. NEMA TS 2 Section 2.1 requirements for Temperature and Humidity, Transient Voltage Protection and Mechanical Shock and Vibration.
3. IEC 61000-4-4; 4-5 Transient Suppression requirements.
4. FCC Title 47, Part 15, Class A, Electronic Noise requirements.

The APS pushbutton enclosure shall meet the NEMA 250 – Type 4X enclosure requirement.

Upon installation the APS shall meet the following functional requirements:

1. *APS functional requirements*. The APS shall have the following functional features:
2. The APS shall be programmable and adjustable. Programming and adjustments shall be made using a laptop computer or vendor supplied programmer. No additional hardware or equipment shall be required. The APS shall be fully compatible with the three latest versions of the Windows operating platform. The programmable features shall be:
3. Push-button locator tone.
4. Walk and Wait audible message.
5. Audible push-button informational message.
6. Audible crossing beacon.
7. Vibrating tactile arrow.
8. Independent minimum and maximum volume limits for the Locator Tone, Walk and Audible Beaconing features.
9. All audible features shall emanate from the pedestrian pushbutton housing. The APS shall utilize digital audio technology, having a minimum 12-bit sample at a 16k Hz sample rate. Total harmonic distortion shall be less than 3 percent at 75 decibels. The APS shall provide independent ambient sound adjustment for the Locator Tone feature. The APS shall allow for Locator Tone volume to be set below the ambient noise level. The system shall have, at a minimum, three programmable locator tones. All sound levels shall adjust automatically utilizing an internally mounted, interval ambient sensing microphone, in accordance with the MUTCD.
10. The APS shall monitor the Walk condition for conflict operation. As a standalone unit, the APS shall disable the Walk functionality should a conflict be detected.
11. The APS system shall log cumulative call data. The data shall be date and time stamped, and shall be accessible via laptop.
12. The system shall have a programmable Extended Push Activation feature with the ability to extend the Walk time and provide an informational audible message. Activation shall be programmable from one to six seconds.
13. The system shall provide a programmable audible Wait message when the button is pushed. The message shall only annunciate once per actuation.
14. *Power Control Unit (PCU).*
15. The PCU shall be mounted in the pedestrian signal head and shall be powered by the activation of Walk or Don’t Walk using 120 Volts Alternating Current (VAC).
16. The PCU shall utilize separate power inputs for Walk and Don’t Walk. The PCU shall not require more than four wires from the PCU to the corresponding push button.
17. The voltage at the push button shall not exceed 24 VAC.
18. *Push* *Button* *Assembly (PBA)*.
19. The PBA shall be a single assembly containing an ADA compliant, vibro-tactile, directional arrow button, weatherproof audible speaker and informational sign with optional placard braille messages. The PBA housing shall not incorporate any plastic or polycarbonate parts.
20. The PBA tactile arrow shall be 2 inches in length and shall be field adjustable to two directions.
21. The pushbutton shall utilize Piezo switch technology rated at greater than twenty million operations. Vibro-tactile operation shall pulse at 20 Hz with a minimum 0.003-inch displacement against a 2 pound applied force.
22. The PBA assembly shall be capable of mounting on a curved or flat surface utilizing either machine screws or bolts or banding type mounting hardware. The PBA shall accommodate mounting to a minimum 2-inch diameter pole.

**CONSTRUCTION REQUIREMENTS**

Prior to start of the installation of the APS, The Contractor shall submit a sample unit for testing. Installation of the APS shall not begin until written approval of the sample has been received from the Engineer. If the unit fails to pass testing, the Contractor shall repair or replace the subsequent units at his expense.

A field test of a single APS shall be performed in the presence of the Engineer. All repairs or replacements required to ensure a fully operational system shall be at the Contractor’s expense.

The APS shall be installed in accordance with the manufacturer’s recommendations.

**METHOD OF MEASUREMENT**

The Accessible Pedestrian Signal (APS) will be measured by the actual number that are installed and accepted.

**BASIS OF PAYMENT**

Payment will be made under:

**Pay Item Pay Unit**

Accessible Pedestrian Signal Each

Payment will be full compensation for all work, materials and equipment required to install a fully operational APS in accordance with these specifications.

The sample APS will not be measured and paid for separately, but shall be included in the work.

Testing will not be measured and paid for separately, but shall be included in the work.