

**665 PEDESTRIAN ~~DETECTOR DETECTION~~ ASSEMBLY SYSTEM.**  
(REV ~~86-27105-13~~) (FA 8-15-13) (1-14)

SECTION 665 (Pages 812 – 813) is deleted and the following is substituted:

**SECTION 665**  
**PEDESTRIAN DETECTOR ~~ION~~ ASSEMBLY SYSTEM**

**665-1 Description.**

Install ~~a~~ pedestrian detector ~~ion assembly~~ system. Use pedestrian detection systems and components listed on the Department's Approved Product List (APL). Pedestrian detection systems are classified into two categories: Standard Pedestrian Pushbutton Detectors and Accessible (Audible/Tactile) Pedestrian ~~Pushbutton~~ Detectors. The components of the pedestrian detection system include pushbuttons, pedestrian actuated ~~signal~~ signs, electronics, wiring, ~~post and conduit riser~~, and mounting hardware ~~and lead-in wire~~.

**665-2 Materials.**

**665-2.1 Standard ~~Pushbutton~~ Pedestrian Pushbutton Detector: Controls**  
(~~buttons~~) Pushbuttons must be raised from or flush with their housings and be a minimum of 2 inches in the smallest dimension. The pushbutton must require ~~force no greater than~~ no more than 5 pounds ~~lb<sub>f</sub>~~ (22.2 N) of force for activation to activate. The ~~assembly~~ detector must be weather-tight and tamper resistant. ~~It must be impossible to receive an electrical shock from touching the assembly detector under any weather condition.~~

**665-2.1.1 Housing:** The ~~assembly~~ housing must be a two piece unit consisting of a base housing and a removable cover. The housing must be cast aluminum meeting the physical characteristics and chemical content established in ASTM- B-26 for alloys S5A and CS72A of ASTM- B-26.

~~Ensure that all parts are made of corrosion resistant materials, such as plastic, stainless steel, anodized aluminum, brass, or gold plated metal. Ensure that all assembly hardware, including nuts, bolts, external screws and locking washers less than 5/8 inch in diameter, are Type 304 or 316 passivated stainless steel. Stainless Steel bolts, screws and studs must meet ASTM F593. Nuts must meet ASTM F594. All assembly hardware greater than or equal to 5/8 inch in diameter must be galvanized. Bolts, studs, and threaded rod must meet ASTM A307. Structural bolts must meet ASTM A325.~~

The housing or adapter (saddle) must conform to the shape of a pole and provide a flush, secure fit. Saddles must be of the same material and construction as the housing. Pushbuttons for wood pole mounting must have threaded holes for 1/2 inch ~~(size 16)~~ conduit provided in the housing top or bottom. A 3/4 inch hole with an insulated bushing shall be provided through the back of the housing. Unused openings shall be closed with a weatherproof closure and painted to match the housing.

The housing must have a powder-coat finish and painted in accordance with Military Standard MIL-PRF-24712A. ~~Pushbutton housings for intersections must be black. Pushbutton housings for mid-block crosswalks must be yellow.~~ The housing must be permanently marked with manufacturer name or trademark, part number, date of manufacture, and serial number.

**665-2.1.2 Pushbutton:** The pushbutton ~~assembly~~ must include a normally open, mechanical phenolic enclosed, positive-acting, spring-loaded, snap-action switch with single pole, single throw contacts or Piezo driven solid state switch rated for a minimum of 50 V. The switch, when activated, must give an audible (i.e., click) or visual indication of actuation. Switch connections inside the housing must allow wiring and installation without binding. The switch must have a design life of one million operations (minimum) at rated load.

~~665-2.1.3 Pedestrian Actuated Signal Sign: The sign must be a minimum thickness of 0.07 inch steel sheeting with baked enamel legend and background or 0.08 inch aluminum sheeting.~~

**665-2.1.3.4 Electrical Requirements:** The wiring must be No. 18 AWG stranded (minimum) with 600 V outdoor insulation rating.

~~665-2.1.45 Post and Riser: The conduit riser, when required for external routing of the lead-in wire, shall be 1/2 inch NPS galvanized steel pipe with threading for attachment to the pedestrian detector housing. Posts used to support pedestrian detector assemblies must be 2-inch O.D. aluminum pipe, unless otherwise shown in the plans.~~

**665-2.2 Accessible (Audible/Tactile) Pedestrian Pushbutton Detector:** The accessible ~~audible/tactile~~ pedestrian pushbutton detector must consist of all electronic control equipment, wiring, mounting hardware, pushbuttons, and pedestrian actuated ~~signal~~ 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.

**665-2.2.1 Electronic Control Equipment:** The ~~audible/tactile~~ accessible pedestrian pushbutton detector must include electronic control equipment that is programmable and adjustable using a laptop computer or vendor supplied programmer. Electronic control equipment must be able to be installed within a traffic controller cabinet or within a pedestrian signal housing. Electronic control equipment installed within a traffic controller cabinet must allow the use of up to 16 pushbuttons (4 maximum per channel) with a single traffic controller cabinet. The accessible ~~audible/tactile~~ pedestrian pushbutton detector must receive timing from Walk and Don't Walk signals.

**665-2.2.1.1 Audible Messages:** Audible messages must be programmable. All audible messages and tones must emanate from the accessible pedestrian pushbutton housing. The accessible ~~audible/tactile~~ pedestrian pushbutton detector must utilize digital audio technology. The system shall have, at a minimum, three programmable locator tones. The accessible ~~audible/tactile~~ pedestrian pushbutton detector must have independent minimum and maximum volume limits for the Locator Tone, Walk, and Audible Beaconing features. The Wait message must only annunciate once per actuation.

**665-2.2.1.2 Pushbutton locator tone:** The ~~audible/tactile~~ accessible pedestrian pushbutton detector must provide independent ambient sound adjustment for the locator tone feature. The ~~audible/tactile~~ accessible pedestrian pushbutton detector must allow for the locator tone ~~volume~~ to be deactivated ~~set below the ambient noise level~~.

**665-2.2.1.3 Vibrating Pushbutton Assembly (VPBA):** The ~~audible/tactile~~ accessible pedestrian pushbutton detector must include a Vibrating Pushbutton (VPB). The VPB must be a single assembly containing an ADA compliant, vibro-tactile, directional arrow button, weatherproof audible speaker and pedestrian actuated ~~signal~~ sign with optional placard Braille messages. The VPB tactile arrow must be 2 inches in length, be field adjustable to two directions, and require no more than 5 pounds of applied force to activate.

**665-2.2.1.4 Conflict Monitoring:** The ~~audible/tactile~~audible accessible pedestrian- pushbutton detector must monitor the Walk condition for conflict operation. The ~~audible-tactile~~audible accessible pedestrian detector system must disable the Walk functionality if a conflict is detected.

**665-2.2.1.5 Cabinet Control Unit (CCU):** The ~~audible/tactile~~audible accessible pedestrian- pushbutton detector may include a ~~cabinet control unit (CCU)~~ for interfacing and connecting the system. The CCU shall have labeled LED indicators for each channel operation. The CCU must reset upon loss of internal communication.

**665-2.2.2 Inputs and Outputs:** All inputs and outputs must use Mil-Spec Multi-pin connectors.

**665-2.2.2.1 Inputs:** Walk and Don't Walk inputs must be optically isolated 80-150 volts AC/DC, 5mA max. General purpose inputs must be optically isolated 10-36 volts AC/DC, 10mA max.

**665-2.2.2.2 Outputs:** Outputs must be optically isolated 36 volts AC/DC peak, 300mA solid state fused contact closures. CCUs must include a normally open relay contact fault output.

**665-2.2.3 Communication:** The CCU must include an Ethernet interface. The CCU must have an integral web server that provides information on audible/tactile pedestrian- pushbutton detector status, access to event logs, and provides for remote Configuration of ~~audible-tactile~~audible accessible pedestrian pushbutton detector system options. VPBs-~~assemblies~~ must include an Ethernet, serial, or USB programming interface.

**665-2.3 Electrical:** All wiring must meet applicable NEC requirements. The ~~audible/tactile~~audible accessible pedestrian- pushbutton detector must operate using a nominal input voltage of 120 volts alternating current (VAC). If any device requires nominal input voltage of less than 120 VAC, furnish the appropriate voltage converter.

~~Audible/tactile~~Audible Accessible pedestrian- pushbutton detector control electronics that are mounted in a pedestrian signal head must be able to receive power from the Walk and Don't Walk circuits of the signal head. Control electronics shall not require more than four wires for each pushbutton connection, and no more than two wires for each controller pedestrian input. Voltage at the pushbutton shall not exceed 24 VAC.

**665-2.4 Mechanical:** Equipment must be permanently marked with manufacturer name or trademark, part number, date of manufacture, and serial number. Do not use self-tapping screws on the exterior of the assembly.

Ensure that all parts are made of corrosion-resistant materials, such as plastic, stainless steel, anodized aluminum, brass, or gold-plated metal. Ensure that all assembly hardware, including nuts, bolts, external screws and locking washers less than 5/8 inch in diameter, are Type- 304 or 316 passivated stainless steel. Stainless ~~S~~steel bolts, screws and studs must meet ASTM- F593. Nuts must meet ASTM- F594. All assembly hardware greater than or equal to 5/8 inch in diameter must be galvanized. Bolts, studs, and threaded rod must meet ASTM- A307. Structural bolts must meet ASTM- A325.

Enclosures must have a NEMA 4X rating. Pushbutton housings for intersections must be black. ~~Pushbutton housings for mid-block crosswalks must be yellow.~~

**665-2.5 Environmental:** Ensure equipment performs all required functions during and after being subjected to the environmental testing procedures described in NEMA TS2, Sections 2.2.7, 2.2.8, and 2.2.9.

### **665-3 Warranty.**

*Ensure that ~~audible/tactile pedestrian pushbutton~~ detection systems have a manufacturer's warranty covering defects for a minimum of 5 years from the date of final acceptance by the Engineer in accordance with 5-11 and Section 608. Ensure the warranty includes providing replacements, within 10 calendar days of notification, for defective parts and equipment during the warranty period at no cost to the Department or the maintaining agency.*

~~Use only an ADA (Americans with Disabilities Act) compliant pedestrian detector assembly listed on the Department's Approved Product List (APL). Ensure that all pedestrian detectors are marked in accordance with Section 603 and the markings are visible after installation.~~

### **665-34 Installation.**

~~Meet the requirements of 653-3.1, except as follows. Connect the lead-in wires to the detector in order to provide proper operation when connected to the controller.~~

Install ~~the~~ pedestrian detector ~~s~~ assembly at the location ~~s~~ and ~~mounted~~ in a manner as shown in the Plans and Design Standards, Index No. 17784. Ensure ~~that~~ all detectors ~~used~~ are ~~of~~ the same manufacturer and model.

*Pushbuttons mounted on wood poles must be serviced by a conduit riser. Pushbuttons mounted on steel or aluminum (poles, pedestals, or posts) must be serviced by wiring inside the pole. Pushbuttons mounted on existing concrete poles may be serviced by a conduit riser ~~or by wiring inside the pole~~. Pushbuttons mounted on new concrete poles or pedestals must be serviced by wiring on the inside. ~~Pushbuttons mounted on concrete poles may be serviced by a conduit riser or by wiring inside the pole. top of a post must be provided with a slip fitter secured rigidly to post using screws.~~*

*A pedestrian actuation ~~ed~~ signal sign must be included with each pushbutton assembly. Provide the sign type, size and legend as specified on the plans or as directed. Tactile arrows of accessible pedestrian pushbuttons must align parallel with the direction of the crossing.*

~~Consider the Plans to be sufficiently flexible as to allow for unanticipated field conditions at the site.~~ The Engineer will direct any variation from the locations shown. When mounting, place the detector housing or saddle in complete contact with the pole or controller cabinet. When a post is required in the installation of the pedestrian detector ~~assembly~~, restore the area around the post to its original condition or as required by the Plans.

### **665-45 Method of Measurement.**

~~665-4.1 General: Measurement for payment will be in accordance with the following tasks.~~

~~665-4.2 Furnish and Install:~~ The Contract unit price ~~each~~ for pedestrian detector ~~s~~, *will be paid per each*, ~~assembly, furnished and installed, and~~ will include *the pedestrian actuationed signal sign*, ~~and~~ all mounting hardware, ~~lead-in wires~~ wiring, materials and equipment, ~~as specified in the Contract Documents~~, and all labor and miscellaneous materials necessary for a complete and accepted installation.

*Payment for poles, pedestals, and posts will be made under their respective pay item numbers.* ~~665-4.3 Furnish:~~ The Contract unit price ~~each~~ for pedestrian detector ~~assembly~~, furnished, will include the cost of the assembly (including all mounting hardware) plus all shipping and handling costs involved in delivery as specified in the Contract Documents.

~~Risers, lead-in wires, or posts are not included in furnish items.~~

~~\_\_\_\_\_The Contractor shall deliver the pedestrian detector assembly in a pre-assembled state. The Contractor shall package and ship component parts of the assembly in accordance with the manufacturer's instructions in order to minimize the potential for damage during shipment.~~

~~\_\_\_\_\_665-4.4 Install: The Contract unit price each for pedestrian detector assembly, installed, will include all materials, equipment, labor and miscellaneous materials necessary to assemble and install all components for a complete and accepted installation. The Engineer will supply the pedestrian detector assembly, including mounting hardware.~~

**665-56 Basis of Payment.**

Price and payment will be full compensation for all work specified in this Section.

Payment will be made under:

Item No. 665- 1- Pedestrian Detector - each.

*Item No. 646- 1- Pedestrian Detector Post – each.*