

**DESCRIPTION**

Under this item the CONTRACTOR shall furnish and install 11 inches high, 7 inches wide "HAND" and "WALKING PERSON" message pedestrian signal with Z crate visor.

**DESIGN**

The general construction shall include a single piece case aluminum housing, a single piece double parabolic reflector, a two symbol two color message lens, a single piece cast aluminum swing down door frame, a blankout Z crate type sun visor, two A21 long life traffic signal lamps, and appropriate sockets and other hardware. The design shall optimize performance per unit of energy and shall accommodate 60, 67, 69 and 116 watt lamps.

Optically, the subject pedestrian signal shall be capable of displaying, brightly and uniformly, while being subject to strong ambient light conditions, the alternate symbol messages "HAND" in portland orange and "WALKING PERSON" in white. Under the same strong ambient light conditions, the messages shall "blankout" when the signal is not energized.

The signal shall be furnished complete with two A21 traffic signal lamps installed. In order to facilitate installation and maintenance, the signal shall be designed so that all components are readily accessible from the front by merely opening the signal door.

**MATERIALS AND CONSTRUCTION**

The signal shall consist of the following:

**Dimensions and Weight**

The maximum overall dimensions of the signal shall be 18 ½ inches wide, 18 ¾ inches high, and 9 inches deep including the Z crate type sun visor and hinges. The distance between the mounting surfaces of the upper (non-shurlock) and the lower (shurlock) openings shall be 15 ¾ inches. The weight of the signal, excluding mounting hardware, shall be 21 pounds maximum.

**Messages**

Messages configuration shall be the "HAND" symbol internally illuminated with a portland orange color source on the left half of the MBS (message bearing surface) and the "WALKING PERSON" symbol internally illuminated with an incandescent white color source on the right half of the MBS. The "HAND" and "WALKING PERSON" symbols shall each be a minimum of 11 inches in height and 7 inches in width. Message configuration, color, and size shall be Class 3 as defined by the Institute of Transportation Engineer's Equipment Standard "Pedestrian Traffic Control Signal Indications", latest revision. Internal illumination shall be provided by an incandescent lamp and a colored lens.

**Optical System**

The optical system shall be designed so as to minimize the return of the outside rays entering the unit from above horizontal (known as sun phantom). The optical system shall consist of:

- a. two symbol two color message lens
- b. double parabolic reflector
- c. lamps and lamp sockets
- c. Z-Crate type sun visor

The inside face of each message section shall be silkscreened with a transparent coating of an appropriate color in the symbol areas to produce a portland orange "HAND" symbol and an incandescent white "WALKING PERSON" symbol when illuminated by a clear A21 traffic signal lamp operating at rated voltage. The entire background shall be a fired ceramic mask, black in color.

**Double Parabolic Reflector**

A single piece double parabolic reflector shall be vacuum formed from 0.250 inch minimum thickness textured polycarbonate plastic. The texture shall be on the bulb side of the reflector and shall conform to C-64 or C-66 pattern or equivalent for light uniformity.

The lamp side of the reflector shall be reflectorized by vacuum deposition of an aluminum coating which shall in turn be protected by a hard wear resistant coating.

The two sections of the reflector shall be divided by a full depth 0.040" aluminum divider that properly mates with the message lens to effectively prevent light spillage from one section to the other.

**Message Lens**

Two lens materials shall be available as follows:

- a. STANDARD: 0.187 inch tempered glass with the outside surface textured to eliminate message "hot spots".
- b. OPTIONAL: 0.250 inch polycarbonate plastic with C-64 or C-66 pattern texture on the outside surface to eliminate message "hot spots".

The lens shall be located at least 1.75 inches away from the closest glass envelope extremity of the ANSI Designation A21 traffic signal lamp.

The inside of the lens shall be fitted with a one piece EPDM neoprene gasket fitted around the perimeter such that a weatherproof seal is afforded whenever the reflector, lens, door frame, and case are properly mated.

**Lamps and Lamp Sockets**

The pedestrian signal shall be completely equipped with traffic signal lamps and sockets (one set for each section of the double parabolic reflector). Each lamp shall be V-beam, clear, group replacement A21, 8000 hour rated life, horizontal with medium base. Each lamp socket shall be accurately positioned so as to be centered and prefocused in its respective section of the reflector when the above described lamps are installed.

Mounting shall be to an aluminum plate so as to efficiently conduct heat away from the socket.

The lamp socket may be made of molded Bakelite, molded phenolic, or ceramic and shall be provided with a brass screw shell with lamp grip.

Each lamp socket shall be provided with one colored lead (non-white and non-green) from the socket and one white lead from the shell. Leads shall be 18 AWG and shall be wired to respective terminals of a three terminal pair screw-type terminal block. The two white wires shall be connected to a common terminal. The terminal block shall be located inside the pedestrian signal housing.

**Z Crate Visor**

Each signal shall be provided with a Z crate type visor designed to eliminate sun phantom.

The Z crate type visor shall be installed parallel to the face of the "HAND/WALKING PERSON" message. The Z crate visor assembly shall be held in place by the use of stainless steel screws or lens clips.

The Z crate assembly shall consist of a minimum of 20 straight horizontal louvers and 21 zig-zag pattern horizontal louvers.

Every other formed louver shall be reversed so as to form cells 1 inch square but rotated 45 degrees from horizontal to provide diamond shaped cells when assembled. Each diamond shall then be bisected by a straight louver inserted between each pair of formed zig-zag louvers. Where each apex of each formed louver comes in contact with the interspersed straight louver, the entire length of the joint shall be chemically welded.

The message surface shall be totally shaded as long as the sun is at least 22 degrees above horizontal. At least 50 percent of the message surface shall be shaded if the sun is 8 degrees or more above horizontal.

The pedestrian shall view at least 50 percent of the message surface when standing 15 degrees left or right of a straight on view of the signal. The message shall not be totally cut off from view of the pedestrian unless the pedestrian is at least 35 degrees left or right of a straight on view of the signal.

It is expected that vandals will impart heavy blows with various objects in an attempt to damage this signal. Installation design and materials employed shall be selected with this in mind. Also, the effects of weather and age shall be considered.

Without unduly restricting the vision to the intended pedestrian, the design shall be physically rugged in terms of material and construction to minimize the damage inflicted by vandals. The basic material used in construction of the Z crate visor shall be nominally 0.030" thick and shall be 100% impregnated black polycarbonate plastic processed with a flat finish on both sides. Physical damage of the polycarbonate louver material shall not expose another color.

No substitutes shall be considered unless it can be proven they are physically stronger and can maintain such characteristics equivalent to polycarbonate with age.

The screen assembly mounting frame shall provide as large an opening as practical such that a part of the message shall not be obscured just because the pedestrian is not viewing the signal straight on. As a minimum, the openings shall be 14 inches in height and 15 ¾ inches in width.

The assembly shall be enclosed in a mounting frame constructed of 0.040" minimum thickness aluminum. This frame shall be 1 ½ inches deep and shall contain mounting holes for installation directly into the pedestrian signal door frame.

### Case

The case shall be a one piece corrosion resistant aluminum alloy die casting complete with integrally cast top, bottom, sides and back. Four integrally cast hinge lug pairs, two at the top and two at the bottom of each case, shall be provided for operation of a swing down door.

The case when properly mated to other pedestrian signal components and mounting hardware shall provide a dustproof and weatherproof enclosure and shall provide for easy access to an replacement of all components.

Three versions of the case shall be available. The first version shall be supplied with clamshell mounting hardware installed (ordered concurrently as an option) for installation of "pole left of message". The second version shall be the same except intended installation shall be "pole right of message". The third version shall contain upper and lower openings as described below suitable for either post top or bracket mounting. The first and second versions need not include upper and lower openings but when provided shall be adequately plugged.

An optional maintenance housing (details of which are described in a separate product note) shall be available to accommodate any of the three mountings described above.

The openings included in the third version at the top and bottom of the case shall accommodate standard 1 ½ inch pipe brackets. The bottom opening of the signal case shall have a shurlock boss integrally cast into the case. The dimensions of the shurlock boss shall be as follows: Outside diameter 2.625 inches; Inside diameter 1.969 inches; Number of teeth 72; Angle of teeth 90; and Depth of teeth 5/64 inch. The teeth shall be clean and sharp and provide full engagement. The radial angular grooves of the shurlock boss, when used with shurlock fittings, shall provide positive positioning of the entire signal to eliminate rotation or misalignment of the signal.

The standard top port shall have a smooth outside surface. An optional top port shall be available with an integral shurlock boss.

### **Door Frame**

The door frame shall be a one piece corrosion resistant aluminum alloy die casting, complete with two hinge lugs cast at the bottom and two latch slots cast at the top of each door. The door shall be attached to the case by means of two Type 304 stainless steel spring pins. Two stainless steel hinged bolts with captive stainless steel wingnuts and washers shall be attached to the top of the case with the use of stainless steel spring pins. Hence, latching or unlatching of the door shall require no tools.

### **Painting**

Prior to final assembly; the case, door frame, and Z crate visor (aluminum portion only) shall be thoroughly cleaned and chromate conversion coating applied inside and out per Military Specification Mil-C-5541. A synthetic enamel conforming to Military Specification TTE-529 shall then be electrostatically applied. The color and glass of the case shall be selected by the purchaser. The color of the door frame and Z crate visor shall be flat black. The finish shall be oven cured for a minimum of 20 minutes at 350°F.

### **Environmental Conditions**

A complete pedestrian signal head equipped with the optional 1/6 watt lamps described herein shall be subjected to 150°F ambient temperature for a period of thirty days with one indication energized from standard line voltage. None of the pedestrian signal components shall exhibit any degradation as a result of this test.

### **Options - Paint**

Standard Paint Housing Federal Yellow.

Paint Door Flat Black.

### **Mounting Options**

**Clamshell 2 mounting (pole left message or pole right). CONTRACTOR must determine**

which option is needed per the intersection drawing.

**METHOD OF MEASUREMENT:**

The quantity to be paid for under this item will be number of each unit furnished and installed in accordance with the plans and specifications.

**BASIS OF PAYMENT**

The unit bid price will be for each unit furnished and installed.

Payment will be made under:

<b><u>Item No.</u></b>	<b><u>Item</u></b>	<b><u>Pay Unit</u></b>
C686.8108	Clamshell Pedestrian Signals	EA