June 5, 1991

BOSTON TRANSPORTATION DEPARTMENT
Specifications for Pedestrian Signals

General

The subject pedestrian signal shall be compatible with clamshell mounting hardware.

The general construction shall include a single piece cast 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 egg 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 consumed and shall accommodate 60, 67, 69 and 116 watt lamps.

Optically, the subject pedestrian signal shall be capable of displaying, brightly and uniformly, the alternate message symbols *"HAND"* in portland orange and *"WALKING PERSON"* in Lunar white while being subject to 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.

Dimensions

The maximum overall dimension of the signal shall be 18 1/2 inches wide, 18 3/4 inches high, and 9 inches deep including egg crate type visor and hinges. The distance between the mounting-surfaces of the upper (non-shurlock) and the lower (shurlock) openings shall be 15 3/4 inches.

Optical System

The optical system shall consist of the following:

a. Two section message lens.
b. Double parabolic reflector
c. Lamps and lamp sockets
d. Egg crate type sun visor.

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 unit shall be so designed and assembled so that erroneous messages cannot be displayed by lamp burnout. or by light spillover

Specifications For Pedestrian Signals.....(cont.)

Hand-Walking Person Message Lenses

Messages shall be lunar white and portland orange as defined in the Institute of Transportation Engineers Tentative Revised Standard "Adjustable Face Pedestrian Signal Head Standard" dated May, 1975 (approved as a standard of the Institute - May, 1976).

Lens materials shall be as follows:

> 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 left half of the message lens, when illuminated, shall display the *"HAND"* message in portland orange. The right half of the message lens, when illuminated, shall display the *"WALKING PERSON"* message in lunar white.

The height of each symbol message shall be a minimum of 11 inches and shall be configured as shown in the "Manual on Uniform Traffic Control Devices" dated 1978, Section 4D-4. The width of the *"HAND"* symbol shall be a minimum of 7 inches. The width of the *"WALKING PERSON"* message shall be a minimum of 6 inches.

The inside face of each message section shall be painted in the symbol areas with an appropriate transparent color to produce a portland orange *"HAND"* symbol and a lunar white *“WALKING PERSON"* symbol when illuminated by a clear A21 traffic signal lamp operating at rated voltage. All other areas shall be painted black.

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

June 5, 1991

Specifications For Pedestrian Signals.....(cont.)

Double Parabolic Reflector

A single piece double parabolic reflector shall be vacuum formed from 0.250 inch minimum thickness textured polycarbonate plastic sheet. The texture shall be on the light 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.

Lamps and Lamp Sockets

The pedestrian signal shall be completely equipped with traffic signal lamps and sockets (one set for each of the two sections of the double parabolic reflector). Each lamp shall be V-beam, clear group replacement A21, 67 watt, 8000 hour rated life, horizontal with medium base. Each lamp socket shall be accurately positioned so as to be centered and pre-focused in its respective section of the reflector when the above described lamps are installed.

Mounting shall be to the die cast aluminum case so as to efficiently conduct heat away from the respective 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 on the head half of the clamshell mounting hardware.

June 5, 1991

Specifications For Pedestrian Signals.....(cont.)

Egg Crate Visor

Each signal shall be provided with an egg crate type visor designed to eliminate sun phantom.

The egg crate type sunshield shall be installed parallel to the face of the *"HAND-WALKING PERSON"* message. The egg crate visor assembly shall be held in place by the use of stainless steel screws.

The egg crate assembly shall consist of 15 vertical members and 26 horizontal members plus two anti-vandal integral locking strips. The completed egg crate portion shall be 1 1/2 inches deep. The vertical spacing of the horizontal members shall be 1/2 inch starting near the top of the *"SYMBOL"* legend and ending near the bottom of the *"SYMBOL"* legend. The horizontal members shall be supported by appropriately spaced vertical members to maintain all horizontal members in parallel displacement.

The basic material used in construction of the egg crate shall be nominally 0.030 thick and shall be 100% impregnated black polycarbonate plastic processed with a flat finish on both sides. Additional members may be employed outside the two legend areas but are not required unless dictated by structural strength of the particular assembly technique employed.

The assembly shall be enclosed in a mounting frame constructed of 0.040 minimum thickness aluminum. This frame shall be 1 1/2 inches deep and shall contain mounting holes for direct insertion in 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 and replacement of all components.

June 5, 1991

Specifications For Pedestrian Signals.....(cont.)

Case.....*(cont.)*
The case shall be provided with holes for left or right clamshell mounting and shall contain upper and lower openings as described below, suitable for either post top or bracket mounting. All initially unused openings shall be adequately plugged.

The case shall be supplied with clamshell hardware mounted for *"pole left of message"* or *"pole right of message"* appropriate for the intersection housing array. For a supply bid, the mix of left and right mounted clamshell hardware shall be as directed by the Boston Transportation Department.

The openings included at the top and bottom of the case shall accommodate standard 1 1/2 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; 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.

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 wing nut 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 egg crate visor (aluminum portion only) shall be thoroughly cleared and a 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 gloss of the case and door frame shall be Gloss Black. The color of the egg crate visor shall be flat black. The finish shall be oven cured for a minimum of 20 minutes at 350 F.

June 5, 1991

Specifications For Pedestrian Signals.....(cont.)

Warranty

The entire pedestrian signal including egg crate visor, message lens, single piece double parabolic reflector, lamp sockets, case and door frame but not the A21 traffic signal lamps shall be warranted for two (2) years from the date of original shipment against defects in workmanship and/or materials.