STATE OF NEW JERSEY
DEPARTMENT OF TRANSPORTATION
TRENTON, NEW JERSEY 08625

METRIC SPECIFICATIONS FOR HIGH PRESSURE SODIUM LUMINAIRES, CUTOFF TYPE

N.J. Specification No. EBM-CF Effective Date: July 1, 2001

New Jersey Department of Transportation Specifications for High Pressure Sodium Luminaires, Cutoff Type.

The purpose of these specifications is to describe minimum acceptable design and operating requirements for High Pressure Sodium Luminaires, Cutoff Type.

GENERAL - I

1-1 High pressure sodium luminaires, cutoff type shall operate at the wattages and voltages specified in the contract documents (or bid documents). The luminaires shall be of the integral ballast type, die-cast aluminum construction, and shall be fully weather-tight. Each luminaire shall be designed for use with the respective horizontally mounted high pressure sodium lamp specified in contract documents (or bid documents).

1-2 Unless otherwise specified in the contract documents (or bid documents), the luminaires shall have a precision optical assembly that will provide a photometric distribution of IES Type Medium/Cutoff/Type II and III. The luminaire shall comply with the attached photometric data for the specified wattage.

1-3 The luminaire housing may be a one or two door assembly. The single door assembly shall consist of an upper housing and a lower one piece door for access to ballast and optical assemblies. The two door assembly shall consist of an upper housing, a ballast assembly access door and an optical assembly access door. The upper housing and access door(s) shall be constructed of die-cast aluminum with integrally cast heavy duty hinge(s) for door(s). Each door shall be equipped with a substantial positive latch to prevent the accidental opening or disengagement of the door assemblies under normal vibration conditions.

1-4 All luminaires of the same wattage to be installed under the same contract shall be physically identical.

1-5 The luminaires shall be equipped with an enclosed slipfitter suitable for mounting on a standard 53 millimeter pipe bracket and shall be arranged to provide a minimum adjustment of 3 degrees above and below horizontal. Leveling and clamping of the luminaires to the bracket arm shall be accomplished by tightening a minimum of two (2) bolts. The mounting opening of the luminaire shall be provided with a cover to prevent insect infiltration into the luminaires.

1-6 Photocontrol receptacle is not required.

1-7 Lamp socket and ballast assembly shall be prewired to terminal block. Compression screw type pressure terminals shall be provided on the terminal block to accept incoming voltage lines. Terminals shall accommodate thru #10 AWG wire.

1-8 The fixture wire shall be capable of withstanding all adverse effects of moisture, corrosive atmospheres and various temperatures associated with the operation of conventional type luminaire.

1-9 All exposed hardware shall be manufactured of corrosion-resistant material.

1-10 Heat, moisture and compression resistant gaskets shall be provided at all critical points to prevent the entry of contaminants. A polyester fiber seal shall be provided around the full perimeter of reflector to prevent contaminants from entering the optical system.

1-11 Adequate provisions shall be provided to the luminaire for the dissipation of heat radiated from the ballast coils and lamp socket.

OPTICAL ASSEMBLY - II

2-1 The optical assembly shall consist of: a highly polished anodized, fabricated aluminum alloy reflector; a heavy duty, anti-vibration, porcelain or fiberglass reinforced polyester (FRP), mogul base lamp socket; and a heat proof, impact resistant, tempered flat glass. The optical systems shall be of a medium cutoff design as defined by I.E.S. The reflector shall be finished using Alzak or Alglas.

2-2 Lamp socket shall be adjustable to permit field changes to other distribution patterns.

2-3 The contractor or company shall submit for approval complete photometric data as follows:

A. Isolux curve for each type of luminaire specified. The curve shall indicate the horizontal lux (lumens per square meter) based on the mounting height indicated on the detail sheets of the contract plans. The curve shall indicate, as a minimum, the isolux lines in an area two mounting heights transversely on the house side, four mounting heights transversely on the street side, and seven mounting heights longitudinally on each side of the luminaire.

B. Coefficient of utilization curve. The curve shall indicate the coefficient of utilization in percent for a transverse distance of a minimum of four mounting heights.

C. Light flux values. The values of light flux shall be given in lumens and percent of lamp lumens, for the output of the luminaire upward and downward, on the street side and house side.

D. Lamp volts versus watt trace.

2-4 Photometric data shall be supplied for each type of luminaire submitted. The data supplied shall consist of a computerized printout of the luminaires specified. The data

shall represent complete isolux charts, etc. The data is to be supplied in accordance with I.E.S. Recommended Standard Format for Electronic Transfer of Photometric Data, dated September 30, 1986.

BALLAST ASSEMBLY - III

3-1 The ballast assembly shall conform to the requirements of American National Standards Institute (ANSI). The ballast assembly shall be composed of the core, copper coil, lamp starter board, non-PCB type capacitor and plug-in disconnect. The ballast assembly shall be easily removable from the luminaire as a unit without removing the luminaire from bracket arm. The ballast assembly shall be completely prewired to the lamp socket and to terminal board by means of female disconnects. The non-PCB type capacitors shall be so located or positioned that they will not be in the direct stream of heat radiated from the ballast coils and the lamp socket. The ballast coils shall be protected with insulation of the highest grade, capable of withstanding all adverse effects of moisture, corrosive atmospheres and high temperature.

3-2 The ballast shall be an autoregulator type. The minimum efficiency of any ballast shall be at least 75 percent. The power factor shall be over 90 percent. At any lamp voltage, from nominal through life, lamp wattage regulation spread at that lamp voltage shall not exceed 15 percent for 10 percent line voltage variation. From nominal line voltage and nominal lamp voltage, the ballast design center will not vary more than 5 percent from rated lamp watts. The ballast shall provide positive starting in temperatures of -40 °C. The losses from the ballast shall not exceed 20 percent for a 250 watt lamp and 30 percent for a 150 watt lamp. The ballast shall be capable of operation with the lamp in an open or short circuit condition for six months without significant loss of ballast life. The ballast shall be multi-tap (120, 208, 240, and 277 volts), unless otherwise specified in the contract documents (or bid documents.)

3-3 The lamp starter board shall be replaceable.

INSTRUCTIONS AND GUARANTEE - IV

4-1 Upon request, one wiring diagram and technical bulletin shall be provided with each luminaire.

4-2 No changes or substitutions in these requirements will be accepted unless authorized in writing. Inquiries regarding this specification shall be addressed to the Manager, Office of Traffic Signal and Safety Engineering, New Jersey Department of Transportation, 1035 Parkway Avenue, P.O. Box 613, Trenton, NJ 08625.

4-3 The luminaire shall carry a one year guarantee from the date of delivery against any imperfections in workmanship and material.

4-4 The company agrees upon the request of the Manager, Office of Traffic Signal and Safety Engineering to deliver to the Office, a sample of the luminaire to be supplied in compliance with these specifications for inspection and test before acceptance. After completion of the test, the sample shall be returned.

LUMINAIRE	150 WATT HPS 16 000 LUMENS CUTOFF TYPE II		150 WATT HPS 16 000 LUMENS CUTOFF TYPE III		250 WATT HPS 27 500 LUMENS CUTOFF TYPE III	
ROADWAY WIDTH (meters)	7.2	10.8	10.8	14.4	22.5	36.0
SPACING (meters)	37.5	38.4	35.4	39.0	54.0	63.0
MOUNTING HEIGHT (meters)	7.8	7.8	7.8	7.8	12.3	12.3
OVERHANG (meters)	0.9	0.9	0.9	3.0	3.0	3.0
INITIAL AVE. LUX	>11	>11	>11	>11	>11	>11
UNIFORMITY (AVE./MIN)	<4	<4	<4	<4	<4	<4
LUMINAIRE ARRANGEMENT	ONE SIDE	ONE SIDE	ONE SIDE	STAGGERED	ONE SIDE	OPPOSITE

PHOTOMETRIC DATA AND CALCULATIONS USING THE ABOVE CRITERIA MUST BE SUBMITTED FOR EACH TYPE LUMINAIRE. FOR APPROVAL, LUMINAIRE MUST MEET ABOVE CRITERIA FOR ALL CASES. THE SUBMISSION SHALL INCLUDE A COMPUTER PRINTOUT ON A 1:100 SCALE PLAN FOR THE LUMINAIRE WITH LUX VALUES GIVEN AT 3 METER INTERVALS. A COPY OF THE PROGRAM WITH DOCUMENTATION ON DISK (IBM COMPATIBLE) WITH THE CALCULATIONS USED TO COMPILE THE DATA SHALL BE SUBMITTED WITH THE LUMINAIRE.