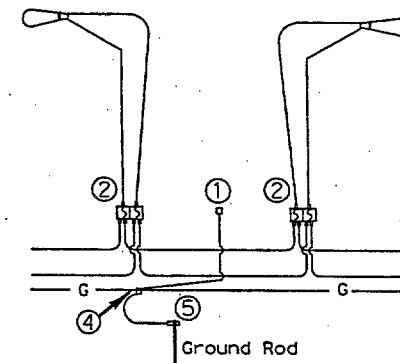


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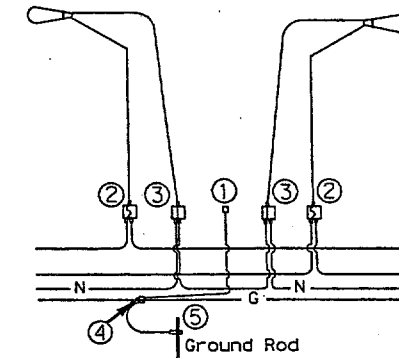
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2. Transformer base shall be approximately 15-20 inches high and shall have a door approximately 13 inches x 8 inches x 9 1/4 inches or as otherwise approved by the Engineer. Screw or bolts for attachment of door to base shall be stainless steel. Four machine bolts with four nuts, eight 1/2 inch flat washers and four lock washer, galvanized ASTM A-153 Class C or D, or B-695 Class 50, shall be provided with each transformer base for connecting the pole. Bolts shall be ASTM A325 or approved equal. Nuts shall be ASTM A-563 grade DH galvanized. A 1/2-13 NC female threaded grounding lug shall be provided inside the transformer base near the bottom.
 3. The X-base shall be made from extruded aluminum channel and aluminum plate. The base breakaway features shall rely on bolt shear and not on bolt torque. Bolt shall have torque controlled break-off hex-head. Bolt shall be Aluminum Association type 2024-T4 aluminum. X-base channel shall be connected with aluminum bolts. Bolt shall be left hand thread and shall not be interchangeable with any other bolt not designed specifically for use with the X-base.
 4. All breakaway bases shall meet the breakaway requirements of the AASTHO "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals," latest edition, and shall have been tested by FHWA-approved methods. All bases shall have been structurally tested to meet or exceed the full designed plastic moment capacity of the pole. Certification of the plastic moment load test and FHWA breakaway requirement test of the model of base being furnished shall be submitted with shop drawings. Shop drawings shall show breakaway base model number and manufacturer's name or logo.
 5. Bases shall be stamped, incised or by other approved permanent means, marked to show fabricator's name or logo, and model number. Such information shall be placed in a readily seen location, inside or outside the base, but shall not be placed on the door.
 6. Doors for transformer bases shall be made of plastic, fiberglass or other non-aluminum material approved by the Engineer. Transformer bases shall be cleaned by grit blast cleaning after heat treatment. Certification by the manufacturer of heat treatment shall be furnished with transformer bases. The certification shall show the metal alloy and temper and that the base meets those requirements, chemical and physical. The certification shall also show the material ASTM specification. Transformer bases shall be cast with a removable tab bar for material testing. Some bars may have been removed by the manufacturer for testing.
- C. Cobra Head Style Fixtures.
1. Fixture shall be UL listed for wet locations and shall be labeled IEC Standard 60529-IP 65 or better. Fixtures shall have UL label on the inside near the ballast. Fixture shall have a permanent label inside the fixture indicating the date of manufacture of the fixture. Fixture shall have wattage label per ANSI 136.15.
 2. Fixture housing, lens frame, and door (if any) shall be die cast aluminum. Aluminum for housing shall be 96% copper free. Fixture mounting means shall be to a two inch pipe arm. Fixture shall be equipped with a four bolt clamp capable of being adjusted plus or minus five degrees from level. Fixture shall meet 3G peak to peak vibration test per ANSI 136.31. Fixture shall meet IESNA cutoff requirements.
 3. Fixture shall have a level bubble attached to the housing. Level bubble shall be clearly visible from the ground (up to 50 ft mounting heights). Level bubble shall be sensitive to one degree (max) changes in position at any point within five degrees (min) of the level position. Photometric testing will be done with the fixture in the level position as indicated by level bubble. Fixture shall be installed in the level position.
 4. EPA shall not exceed 1.6 square feet.
 5. Fixture shall be equipped with a three prong photocell receptacle with shorting cap installed.
 6. For fixtures to be installed on galvanized poles, the fixture housing shall be painted light gray. All other fixtures shall be painted to match poles or as approved by the Engineer.
 7. Paint for fixtures shall be a thermoset powder coat system. Paint system must meet 1000 hour salt spray test per ASTM B117. Paint thickness shall be a nominal thickness of 2.5 mil and shall exhibit no pigment loss upon 50 double-rubs using Methyl Ethyl Ketone (MEK) solvent per ASTM D5402, Standard Practice for Assessing the Solvent Resistance of Organic Coatings Using Solvent Rubs.
 8. All hardware, brackets, nuts, bolts, washers, ballast tray, and parts shall be made of Type 316 stainless steel, except that:
 - a. Hardware, brackets, and ballast tray may be made out of aluminum, of adequate thickness as approved by the Engineer.
 - b. 4 bolts, 4 flat washers, 4 lock washers, and clamp that attach the luminaire to the arm shall be galvanized to ASTM 123 or 153.
 - c. All stainless steel nuts shall have nylon throat locking means.
 - d. Glass lens retainer spring clips may be galvanized steel in accordance with ASTM A153.
 9. Lamp socket shall meet the following requirements.
 - a. Socket shall be porcelain insulated,
 - b. Socket shall have a nickel plated copper alloy screw shell,
 - c. Socket shall be equipped with a spring tensioned contact.
 - i. Contact shall be nickel plated copper alloy or stainless steel.
 - ii. Spring shall be nickel plated copper alloy or stainless steel.
 - d. Screws holding screw shell into socket, if any, shall be nickel plated copper alloy or stainless steel.
 - e. Socket electrical ratings shall meet or exceed the following
 - i. 600 Volt
 - ii. 1500 Watt
 - iii. 5000 Volt Pulse
 - iv. UL listed per UL 496.
 - v. Socket shall be mogul base.
 10. Optical assemblies shall meet the following requirements.
 - a. Reflectors shall be polished aluminum with Alzak or equal coating.
 - b. Reflectors shall not have any reflecting surface painted, except that, when approved by the Engineer, some surfaces may be painted with 92% reflective white paint.
 - c. Reflectors may be one piece or segmented as follows.
 - i. One piece reflectors:
 1. One piece reflectors shall be sealed directly to the glass lens forming an airtight envelope. The reflector to glass lens seal shall be closed cell silicone, either seamless or with a vulcanized seam.
 2. Lamp socket shall be non-adjustable and mounted to the reflector so that lamp center is consistent. Gasket between lamp support bracket and the reflector/lens assembly shall be a one piece seamless silicone gasket.
 - ii. Segmented reflectors:
 1. Segments shall attach at both ends (or opposite sides if segments are square) of the segment to a rigid aluminum base plate and side wall support assembly. Glass lens to lens frame shall be sealed with a one piece seamless silicone gasket or RTV sealant.
 - d. Optical assembly shall be equipped with a lamp support in addition to the lamp socket to ensure that the lamp center is positioned as intended.
 11. Lens shall be clear heat tempered or borosilicate sag or flat glass, minimum 3/16" thick.
 12. Luminaires for pole mounting shall not be fused. Luminaires for wall or underpass mounting shall be internally fused with a 10 amp time delay fuse.
 13. Fixture shall be equipped with a two position terminal block for landing supply wires. Terminal block shall meet the following requirements.
 - a. Insulation shall be porcelain or phenolic material. Phenolic terminal block will be of adequate construction as approved by the Engineer.
 - b. Terminals shall be made of nickel or tin plated brass, or of aluminum.
 14. Fixture shall be equipped with MOV surge protection in accordance with IEEE recommendations.
 - a. MOV shall be connected from line to neutral or from line to line.
 - b. MOV shall be installed on the terminal block.

Fabrication Tolerances Table		
Part	Dimension	Tolerance
Pole Assembly	Shaft length	± 1"
	I.D. of outside piece of slip fitting pieces	+ 1/8" - 1/16"
	O.D. of inside piece of slip fitting pieces	+ 1/32" - 1/8"
	Shaft diameter: other	+ 3/16"
	Out of "round"	1/4"
	Straightness of shaft	± 1/4" in 10 ft
	Twist in shaft	4° in 50 ft
	Perpendicular to baseplate	1/8" in 24"
	Pole centered on baseplate	± 1/4"
	Location of Attachments	± 1/4"
Arm Assembly	Arm Length	± 3"
	Arm Rise	± 1 3/4" in 10 ft
	Arm Diameter	± 3/16"
	Overall length or width	± 1/4"
	Thickness	+ 1/4" - 1/16"
	Deviation from flat	1/8" in 12"
	Spacing between holes	± 3/32"
Anchor Bolt	Anchor bolt hole size	± 1/16"
	Length	+ 1" - 1/4"
	Threaded length	+ 1 1/2" - 1/8"
Miscellaneous	Galvanized length (if required)	+ 8" - 1/4"
	Bolt hole spacing	± 1/16"
	Strut location in truss arms	± 1 1/2"



FOR THREE-WIRE CIRCUIT-CENTER GROUNDED
LUMINAIRES SERVED AT 480V ON 240/480 VOLT SERVICE OR LUMINAIRES SERVED AT 240V FOR 120/240 VOLT SERVICE.



FOUR-WIRE CIRCUIT-CENTER GROUNDED
LUMINAIRES SERVED AT 240V (240/480 VOLT SERVICE)

NOTES:

- 1 Pole Bonding Connector Blackburn TTC3 or Weaver TGC3 or equal.
- 2 Fused Connector-All electrical connectors for breakaway poles shall be watertight and shall be designed as break-away (Buchanan 65U, Bussmann HEBW, Littelfuse LEB or equal). All fuses shall be time-delay types. 10 Amp (Littelfuse FLO, Bussman FNQ or equal).
- * 3 Un-fused Connector-All electrical connections for neutrals shall be watertight. For breakaway poles, connections shall be designed as breakaway, shall have a white color marking, and shall have a permanently installed solid neutral (Buchanan 20U, Bussmann HET, Littelfuse LET or equal). Dummy/Neutral fuse shall be Bussman NTS-R-3 or equal.
- 4 Split Bolt or other connector.
- 5 Ground Rod Clamp - Blackburn GG58H, Burndy GKP635, or equal.

*For Transformer Base Poles. On Shoe Base Poles omit un-fused connector for neutral conductor.

1/04 Revision
Modify fixture specifications

STANDARD PLANS
Texas Department of Transportation
Traffic Operations Division

ROADWAY ILLUMINATION DETAILS

RID(2)-04

REVISIONS	DATE	BY	DESCRIPTION
5-93			
10-93			
10-98			
1-04			

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COUNTY	SECTION	JOB	REVISION
DALLAS	0918	US 344	05

172B