LIGHT, WARNING, ROTATING INCANDESCENT,
360 DEGREE, PERMANENT MOUNT

PUBLICATION

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PART I

GENERAL CLAUSES AND CONDITIONS

1. The equipment furnished under this specification shall be the latest improved model in current production as offered to commercial trade, and shall be of quality workmanship and material. The bidder represents that all equipment offered under this specification shall be new. USED, SHOPWORN, DEMONSTRATOR, PROTOTYPE, OR DISCONTINUED MODELS ARE NOT ACCEPTABLE.

2. Bidders should submit with the bid, or have on file with TxDOT, Austin, Texas, the latest printed literature and detailed specifications on the equipment the bidder proposes to furnish. This literature is for information purposes only.

3. The unit shall be completely assembled and adjusted, and all equipment, including standard and supplemental equipment shall be installed and the unit made ready for continuous operation.

4. All parts not specifically mentioned which are necessary for the unit to be complete and ready for operation or which are normally furnished as standard equipment shall be furnished by the vendor. All parts shall conform in strength, quality and workmanship to the accepted standards of the industry.

5. The unit provided shall meet or exceed all Federal and state of Texas safety, health, lighting and noise regulations and standards in effect and applicable to equipment furnished at the time of manufacture.

6. It is the intent of TxDOT to purchase goods, equipment and services having the least adverse environmental impact, within the constraints of statutory purchasing requirements, departmental need, availability, and sound economical considerations. Suggested changes and environmental enhancements for possible inclusion in future revisions of this specification are encouraged.

7. TxDOT encourages all manufacturers to comply voluntarily with the Society of Automotive Engineers (SAE) Recommended Practice for marking of plastic parts per the latest revision SAE J1344. All plastic components furnished to this specification should have an imprinted SAE symbol identifying the resin composition of the component so that the item can be recycled after its useful life. Manufacturers are encouraged to use recycled plastics and materials in the manufacture of their products in order to conserve natural resources, energy and landfill space. Bidders should note that future specification revisions may require mandatory compliance with the SAE plastic coding system.

8. TxDOT is committed to procuring quality goods and equipment. We encourage manufacturers to adopt the International Organization for Standardization (ISO) 9001-9003 standards, technically equivalent to the American National Standards Institute/American Society for Quality Control (ANSI/ASQC Q91-93 1987), and obtain certification. Adopting and implementing these standards is considered beneficial to the manufacturer, TxDOT, and the environment. It is TxDOT’s position that the total quality management concepts contained within these standards can result in reduced production costs, higher quality products, and more efficient use of energy and natural resources. Manufacturers should note that future revisions to this specification may require ISO certification.

9. TxDOT is in the process of converting to the metric system. During the interim changeover period, measurements will be given in both the English and metric system. Where any conflict between the two stated measurements may occur, the measurements provided in the English system shall supersede those provided in the metric system.

* Amended date to remove contact information
PART II

SPECIFICATIONS

1. SCOPE: This specification describes a 360 degree, rotating emergency warning device used on various types of TxDOT emergency, maintenance, construction, passenger, and service vehicles to alert and warn motorists of hazardous and/or unprotected highway conditions. The warning light is subject to very rugged use under on and off road conditions and shall withstand extreme vibration, shock, humidity, rain, snow, ice, sunlight, temperature, and dust. Only those warning lights that are designed, manufactured, and tested for such conditions will be considered. Lights furnished to this specification shall meet or exceed the requirements herein.

2. EXAMPLES: Star 400B or TxDOT approved equal
   Grote 01-7622-72 or TxDOT approved equal

NOTICE TO BIDDERS: Any example shown is listed to show type and class of equipment desired. Bidders are cautioned to read the specifications carefully, as there may be special requirements not commonly offered by the equipment manufacturer. Do not assume your standard equipment meets all detailed specifications merely because it is listed as an example. Bidders are cautioned that any unit delivered to the FOB point which does not meet specification in every aspect will not be accepted.

3. FUNCTIONAL REQUIREMENTS: The light shall:
   3.1. Be a “class I” 360 degree emergency warning device and shall meet or exceed requirements identified in the latest revision SAE J845 (360 Degree Warning Devices for Authorized Emergency, Maintenance, and Service Vehicles) and shall be identified in accordance with SAE J759 JAN95 (Lighting Identification Code).
   3.2. Continuously rotate around a vertical axis and produce two continuously rotating horizontal beams of light 180 degrees apart.
   3.3. Operate on a 12-volt electrical system.
   3.4. Meet the photometric requirements outlined in Tables 1 and 4 of the latest revision SAE J845.

4. DESIGN REQUIREMENTS:
   4.1. The lens shall:
      4.1.1. Be furnished with a 360 degree, high heat resistant, high impact, shatter resistant amber polycarbonate lens.
      4.1.2. Have a lens retainer constructed of a non-corrosive type metal such as aluminum or stainless steel. Design of lens retainer shall allow the lens to be removed and reassembled using only a screwdriver or by unsnapping a clamp
      4.1.3. The metal base housing shall:
      4.1.4. Be constructed of die-cast galvanized steel, or fabricated aluminum or stainless steel with a thickness sufficient to withstand extreme conditions such as those described in Paragraph 1, Part II above.
      4.1.5. Be designed to provide rigid support to the lamps, motor, drive train, and lens.
      4.1.6. Have weep holes for drainage of condensation.
      4.1.7. Be equipped with housing seals for all exposed mating surfaces.
      4.1.8. Be equipped with a gasket or mounting pad to form a weatherproof seal between the lamp housing and the vehicle roof.
      4.1.9. The motor and drive train shall:
      4.1.10. Be equipped with a minimum 1.5 amp, 12 volt DC, high-torque, permanent-magnet type motor, driving the rotating lamp through a gear train.
      4.1.11. Be permanently lubricated and sealed within a die-cast metal housing or in a stamped metal body with die-cast end plates.
      4.1.12. Have a gearbox that provides rigid support for the drive shaft and solid positioning for the gears and motor.
      4.1.13. Have a drive shaft that is a minimum 1/4 inch (6.35mm) diameter hardened steel alloy supported in at least two points by bushings or bearings.
      4.1.14. Equipped with one support at each end of the gearbox.
      4.1.15. Have the drive train bolted securely to the housing and designed to allow the lamps to:
         4.1.15.1. freely rotate in either direction with the motor power off.
         4.1.15.2. be stopped and held without damage to the motor or drive train with the motor power on.
         4.1.15.3. produce a minimum of 60 to a maximum of 120 flashes per minute
      4.2. The lamps shall:
      4.2.1. Be field replaceable.
4.2.2. Have mounts secured to the drive shaft.

4.2.3. Receive power by leaf spring contacts or heavy duty push-on connectors, which shall be firmly attached to the wire and overlap wire insulation. Screw connectors are not acceptable.

4.2.4. Have rotating connections through a carbon brush to copper or copper alloy collector ring.

4.3. Dimensions:

4.3.1. The overall diameter of the light, including the metal base shall be a maximum 12 inches (305 mm).

4.3.2. Height from the bottom of the metal base (less any gaskets) to the top of the lens shall be maximum 12 inches (305 mm).

4.3.3. The weight of the light shall be maximum 10 pounds (4.54 kg).

4.4. Mounting:

4.4.1. A minimum of 15 feet (4.6 m) of electrical cable shall be provided for installation of each rotating light. The cable shall be minimum 18 gauge, type GPT insulated wire.

4.4.2. Shall be equipped with a lighted on/off control switch. A mounting bracket for the switch shall be provided if other than a universal type switch is furnished.

4.4.3. A rubber, neoprene, or TxDOT approved equivalent gasket shall be provided to be installed between the vehicle and the base plate.

4.4.4. All hardware needed for normal mounting shall be furnished. The hardware shall include, but not be limited to, gaskets, grommets, stainless steel nuts, bolts, and washers.

4.5. The total current drain of the assembled unit shall be a maximum of 6.2 amps at 12.8 volts DC.

5. INDEPENDENT LABORATORY TESTING:

5.1. All rotating lights bid shall be tested by an independent testing laboratory acceptable to TxDOT and in accordance SAE J845, SAE J575 and J578 or latest revisions, with all tests conducted on the same sample. Examples of approved independent testing laboratories are provided below:

EXAMPLES: Calcoast Analytical-ITL or TxDOT approved equal
ETL Testing Laboratories, Inc or TxDOT approved equal.

5.2. The rotating light shall operate without failure during the tests specified below. A copy of the test results shall be furnished to TxDOT within ten days of request by TxDOT. Failure to provide this report within ten days may result in the rejection of a bid. The test report shall include, but not be limited to, the following:

5.2.1. Vibration Test
5.2.2. Moisture Test
5.2.3. Dust Test
5.2.4. Corrosion Test
5.2.5. Photometry Measurements with results for 12 volt operation
5.2.6. High Temperature Flash Rate Test with results for 12 volt operation
5.2.7. Low Temperature Flash Rate Test with results for 12 volt operation
5.2.8. Durability Test with results for 12 volt operation
5.2.9. Color Test using either the Tristimulus method or the Spectrophotometric method. The color shall be that of the emitted light, not that of the material used for the lens.

5.3. Once test results are submitted and have been approved by TxDOT, any subsequent changes to the design, quality of materials, or substitution of components shall not be made without notifying TxDOT. If approved light is changed, the vendor/manufacturer shall notify this address: TxDOT/ATTN: General Services Division, 125 East 11th Street, Austin, Texas, 78701. The new light must be approved in writing by TxDOT prior to acceptance of subsequent shipments.

5.4. TxDOT may test any device received to assure compliance with this specification.

6. RADIO FREQUENCY INTERFERENCE (RFI): Lights will be installed on vehicles that have land mobile radio transceivers. These transceivers will operate in either a low band (30 to 50 MHZ), high band (150 to 174 MHZ), or UHF band (450 to 512 and 806 to 870 MHZ). Antennas will be mounted on the roof, front fender, and/or rear fender. These vehicles will be subject to testing in accordance with the tests defined below.

6.1. Radio Transceiver Immunity: In accordance with the tests defined below, vendor will be accessed any and all charges associated with the testing of vehicles which fail to meet RFI requirements. TEST METHOD/TEST LIMIT: Texas Department of Transportation (TxDOT) Radio Frequency (RF) Radio Interference “SINAD” Test, Texas Test Method TEX 899-B, Latest Revision.
6.2. **Vehicle Immunity:** The vehicle electronic equipment shall not be adversely affected in operation, safety, or control by radio frequency (RF) energy generated and radiated by installed lights. In accordance with the tests defined below, vendor will be accessed any and all charges associated with the testing of vehicles which fail to meet RFI requirements. 

**TEST METHOD/TEST LIMIT:** Society of Automobile Engineers (SAE) Surface Vehicle Standard Vehicle Electromagnetic Immunity - On-Board transmitter Simulation - J551/12, Latest Revision.

6.3. **Frequencies Used by TxDOT:**

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**NOTE:** Although not in use for mobile installation at the present time, state agencies are licensed to operate within the following range of frequencies: (These frequencies are not all inclusive, since further licensing is expected in the future in the 806 to 870 MHZ range.)

- 45.680 to 400MHz
- 150.995 to 156.135 MHZ
- 159.180 to 162.550 MHZ
- 453.050 to 458.950 MHZ
- 806.000 to 870.000 MHZ

7. **CONFLICT:** In the event of a conflict between this specification and any SAE Recommended Practice, the provisions of this specification shall prevail.

8. **WARRANTY:** This rotating light shall be warranted against defective materials, workmanship and failure for 12 months from the date of acceptance. If the manufacturer’s warranty is in excess of 12 months, the standard warranty shall apply. The vendor shall furnish a warranty card with the unit indicating the terms and conditions of the warranty. The vendor shall furnish at time of delivery a list of names and addresses of servicing dealers in the state of Texas who will perform warranty work. Provisions shall be made by the vendor to provide a delayed warranty start date for each unit furnished to this specification. Warranty start date shall be effective the day the unit is placed into service. Instructions shall be included with each unit delivered, advising TxDOT personnel of the procedures to be followed for obtaining the delayed warranty start date.

9. **PACKAGING:** Each rotary light shall be individually boxed including all hardware and manuals. Each light shall be permanently marked with an identification label or decal showing make, model, and operating voltage.

10. **DATA SHEET:** The attached data sheet should be completed and submitted in duplicate for informational purposes only.

11. **APPLICABLE REFERENCES:**


   11.2. SAE J845, MAR1992, 360 Degree Warning Devices for Authorized Emergency, Maintenance, and Service Vehicles


**PART III**

**OPTIONS**

Options must be identified on the Invitation for Bids the be required.

1. **OPTION NO. 1:** 24 VOLT - Lamp shall meet all specified requirements except that it be designed and wired to operate in a 24 volt DC electrical system.

2. **OPTION NO. 2:** BLUE LENS - Lamp shall meet all specified requirements except that it have a blue lens rather than amber as specified in Paragraph 4.1.
Bidder should insert the requested information and return two copies for informational purposes only.

The following information is requested on the rotating warning light the bidder is offering:

1. Rotating Light Make: _______________________      Model: ____________________________
2. Does the rotating light being offered meet all stated requirements of the specification? 
   __________________
3. Rotator speed is ________ flashes per minute
4. Is the power for the system 12 volt DC? ____________
5. Light has on/off switch? ________________
6. Does light have field replaceable lamps? ________________
7. Base and base plate is constructed of ________________
8. Diameter at the base? ________________
9. Overall height (including the metal base)? ________________
10. Length of power cable provided: ________________
11. Has the rotating light been independently tested in accordance with the latest revisions of SAE J575, SAE J845 and SAE J578? ________________   Is a copy of the test results furnished with the bid? ________________

Verification Test Report Number __________________________________  Date _____________________________
Testing Facility:  _________________________________________________________________________________

Name and address of firm nearest the FOB point in Texas that will provide warranty service and repair parts:
Firm Name:  ____________________________________________________________________________________
Address:  ______________________________________________________________________________________
Telephone:  _______________________________ Individual to Contact:: ________________________________________

Bidder should provide a complete parts list including, but not limited to, the following: Part name (type), quantity, size of gauge, manufacturer and part number. Bidders should also provide a schematic diagram of the electronic and electrical components of the light.

Bidder’s Telephone No. ___________________________________________________

Bidder’s Signature ____________________________________________________ Print or Type Bidder’s Name

NOTE: THIS PAGE SHOULD BE RETURNED FOR INFORMATIONAL PURPOSES ONLY.