



## Florida Department of Transportation

**CHARLIE CRIST**  
GOVERNOR

605 Suwannee Street  
Tallahassee, FL 32399-0450

**STEPHANIE KOPELOUSOS**  
INTERIM SECRETARY

February 14, 2007

Mrs. Leslie McCarthy, PhD, P.E.  
Program Operations Engineer  
Federal Highway Administration  
545 John Knox Road, Suite 200  
Tallahassee, Florida 32303

Re: Office of Design, Specifications  
Section 992  
Proposed Specification: 9920001-Highway Lighting Materials

Dear Mrs. McCarthy:

We are submitting, for your approval, two copies of a proposed Supplemental Specification for Highway Lighting Materials.

This change was proposed by Chester Henson of the Roadway Design Office to specify criteria for concrete foundations and bases as well as alternate foundations for light poles.

Please review and transmit your comments, if any, within two weeks. Comments should be sent via Email to SP965DB or [duane.brautigam@dot.state.fl.us](mailto:duane.brautigam@dot.state.fl.us).

If you have any questions relating to this specification change, please call Duane F. Brautigam, State Specifications Engineer at 414-4110.

Sincerely,

Signature on file

Duane F. Brautigam, P.E.  
State Specifications Engineer

DFB/sh

Attachment

cc: General Counsel  
Florida Transportation Builders' Assoc.  
State Construction Engineer

**HIGHWAY LIGHTING MATERIALS.****(REV 1-8-072-14-07)**

ARTICLES 992-1 thru 992-4 (Pages 902-904) is deleted and the following substituted:

**992-1 Basic Design Criteria.**

**992-1.1 General:** ~~Unless otherwise specified in the plans or the specifications,~~ *The* light poles and bracket arms shall be in accordance with the requirements of the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, *the Florida* **FDOT Structures Manual** and with the specific requirements contained in this Section.

**992-1.2 Wall Thickness of Steel *High Mast* Poles:** The minimum wall thickness for galvanized steel poles shall be ~~0.1196~~ *0.1793* inch (~~744~~ gauge).

~~992-1.3 Design Calculations:~~ The Contractor shall submit for approval, design calculations of the light poles (including bracket arms) and anchor bolts.

**992-1.34 Light Pole Assembly:** The light pole assembly shall conform to the applicable requirements of IES, EEI, and NEMA (Illuminating Engineering Society, Edison Electric Institute, and National Electrical Manufacturers Association).

**992-2 Light Poles.**

**992-2.1 Galvanized Steel:** ~~Unless otherwise shown,~~ Galvanized steel *high mast* light poles shall be ~~one piece,~~ continuous-tapered, round or *minimum of 12 sided* octagonal poles. *Each section* and shall be manufactured from one length of steel sheet, formed in continuous tapered tube, with one continuous arc-welded vertical seam. They shall be galvanized in accordance with ASTM A 123.

**992-2.2 Aluminum:** Aluminum light poles shall be *round*, one piece, continuous-tapered, ~~round or octagonal shaft,~~ of high-strength, corrosion-resistant aluminum, and of *an* approved alloy meeting the requirements ~~of~~ for the design as specified *Design Standards* in 992-1.

**992-2.3 Length:** The poles shall be of such length as to provide the approximate luminaire mounting height shown in the plans or directed by the Engineer.

**992-2.4 Bases:** ~~Anchor base poles shall have a wiring hand hole with a weatherproof metal cover near the base, with a grounding lug located inside the pole near the hand hole.~~ Transformer base poles shall have a grounding lug in the transformer base. A heavy cast base shall be attached to the lower end of each shaft by a continuous arc weld, inside and outside of the shaft, or by a combination of arc welding and a press fit, subject to the approval of the Engineer. The base shall be arranged for anchoring to a transformer base or a concrete foundation with four anchor bolts 1 inch (minimum size), unless otherwise shown in the plans.

**992-2.5 General:** The lighting pole assembly shall conform to the applicable requirements of IES, EEI and NEMA. The base shall be provided with the necessary anchorage, hardware, and bolt covers. An ornamental cap shall be provided to fit over the top of the pole to exclude moisture. All poles not located behind guardrail or bridge rail, or that are not wall mounted, shall be frangible, except as shown in the plans.

### 992-3 Bracket Arms.

~~Steel or aluminum bracket~~ *Bracket* arms shall be *aluminum*, of truss-type construction, consisting of upper and lower members with vertical struts, and shall have the luminaire end formed to accommodate a 2 inch pipe slipfitter. The bracket arms shall meet the design requirements of 992-1.1 and 992-1.3. Bracket arms shall be attached to either steel or aluminum poles, with machine bolts and pole adapters, unless approved otherwise.

~~Steel bracket arms shall be used with steel standards, and aluminum bracket arms shall be used with aluminum standards.~~

~~Steel brackets shall be galvanized in accordance with ASTM A 123.~~

### 992-4 Luminaires, Ballasts, etc.

Luminaires shall consist of a precision-cast aluminum housing and reflector holder, a refractor-holder latch on the street side, and a hinge with a safety catch on the house side of the luminaire; also a slipfitter suitable for attaching to a 2 inch mounting bracket, gasketing between the reflector and the refractor and the socket entry, an adjustable bracket capable of producing the specified IES type light distributions, and a heat-resistant, high-transmission glass prisomatic refractor. Luminaires may be mercury vapor, *induction*, metal halide, or high pressure sodium vapor, as indicated in the plans.

Unless otherwise indicated in the plans, the luminaires shall have internal ballasts of the regulated output (constant wattage) type, suitable for operating on the circuits shown in the plans. The ballasts shall be pre-wired to the lamp socket and terminal board, requiring only connection of the power-supply leads to the ballast primary terminals. The efficiency of the ballast shall be at least 84% and the *have a* power factor *of* shall be at least 9590%. The ballast shall provide for regulation within  $\pm 62\%$  variation in lamp watts *at* and a primary voltage variation of  $\pm 100\%$  *for lamps of 400w or less and provide for regulation within  $\pm 13\%$  variation in lamp watts at a primary voltage variation of  $\pm 10\%$  for lamps of 750w or greater.*

The luminaires shall meet the requirements shown in the plans.

**992-4.1 Certification:** The Contractor shall provide the Engineer a certification conforming to the requirements of Section 6 from the manufacturer of the luminaries and electrical ballasts confirming that the requirements of this Section are met. Each certification shall cover only one LOT for luminaries and/or electrical ballasts.

## **HIGHWAY LIGHTING MATERIALS.**

**(REV 2-14-07)**

ARTICLES 992-1 thru 992-4 (Pages 902-904) is deleted and the following substituted:

### **992-1 Design Criteria.**

**992-1.1 General:** The light poles and bracket arms shall be in accordance with the requirements of the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, the FDOT Structures Manual and with the specific requirements contained in this Section.

**992-1.2 Wall Thickness of Steel High Mast Poles:** The minimum wall thickness for galvanized steel poles shall be 0.1793 inch (7 gauge).

**992-1.3 Light Pole Assembly:** The light pole assembly shall conform to the applicable requirements of IES, EEI, and NEMA (Illuminating Engineering Society, Edison Electric Institute, and National Electrical Manufacturers Association).

### **992-2 Light Poles.**

**992-2.1 Galvanized Steel:** Galvanized steel high mast poles shall be continuous-tapered, round or minimum of 12 sided poles. Each section shall be manufactured from one length of steel sheet, formed in continuous tapered tube, with one continuous arc-welded vertical seam. They shall be galvanized in accordance with ASTM A 123.

**992-2.2 Aluminum:** Aluminum light poles shall be round, one piece, continuous-tapered, high-strength aluminum, and of an approved alloy meeting the requirements of the Design Standards.

**992-2.3 Length:** The poles shall be of such length as to provide the approximate luminaire mounting height shown in the plans or directed by the Engineer.

**992-2.4 Bases:** Transformer base poles shall have a grounding lug in the transformer base. A heavy cast base shall be attached to the lower end of each shaft by a continuous arc weld, inside and outside of the shaft, or by a combination of arc welding and a press fit, subject to the approval of the Engineer. The base shall be arranged for anchoring to a transformer base or a concrete foundation with four anchor bolts 1 inch (minimum size), unless otherwise shown in the plans.

**992-2.5 General:** The lighting pole assembly shall conform to the applicable requirements of IES, EEI and NEMA. The base shall be provided with the necessary anchorage, hardware, and bolt covers. An ornamental cap shall be provided to fit over the top of the pole to exclude moisture. All poles not located behind guardrail or bridge rail, or that are not wall mounted, shall be frangible, except as shown in the plans.

### **992-3 Bracket Arms.**

Bracket arms shall be aluminum, truss-type construction, consisting of upper and lower members with vertical struts, and shall have the luminaire end formed to accommodate a 2 inch pipe slipfitter. The bracket arms shall meet the design requirements of 992-1.1 and 992-1.3. Bracket arms shall be attached to aluminum poles, with machine bolts and pole adapters, unless approved otherwise.

**992-4 Luminaires, Ballasts, etc.**

Luminaires shall consist of a precision-cast aluminum housing and reflector holder, a refractor-holder latch on the street side, and a hinge with a safety catch on the house side of the luminaire; also a slipfitter suitable for attaching to a 2 inch mounting bracket, gasketing between the reflector and the refractor and the socket entry, an adjustable bracket capable of producing the specified IES type light distributions, and a heat-resistant, high-transmission glass prismatic refractor. Luminaires may be mercury vapor, induction, metal halide, or high pressure sodium vapor, as indicated in the plans.

Unless otherwise indicated in the plans, the luminaires shall have internal ballasts of the regulated output (constant wattage) type, suitable for operating on the circuits shown in the plans. The ballasts shall be pre-wired to the lamp socket and terminal board, requiring only connection of the power-supply leads to the ballast primary terminals. The ballast shall have a power factor of at least 90%. The ballast shall provide for regulation within  $\pm 6\%$  variation in lamp watts at a primary voltage variation of  $\pm 10\%$  for lamps of 400w or less and provide for regulation within  $\pm 13\%$  variation in lamp watts at a primary voltage variation of  $\pm 10\%$  for lamps of 750w or greater.

The luminaires shall meet the requirements shown in the plans.

**992-4.1 Certification:** The Contractor shall provide the Engineer a certification conforming to the requirements of Section 6 from the manufacturer of the luminaries and electrical ballasts confirming that the requirements of this Section are met. Each certification shall cover only one LOT for luminaries and/or electrical ballasts.