

## SECTION 700

### TRAFFIC CONTROL DEVICES

#### I. GENERAL

##### 1.1 DESCRIPTION

These specifications cover general construction items, methods, and procedures common to traffic control devices. Installation of materials shall be accomplished in accordance with the manufacturer's instructions except when otherwise indicated.

##### 1.2 MATERIALS

- A. Concrete shall be Class A3 conforming to VDOT *Road and Bridge Specifications*, Section 217 unless otherwise specified.
- B. Reinforcing steel shall conform to VDOT *Road and Bridge Specifications*, Section 223.
- C. Dissimilar metals - The contact surfaces between dissimilar metals shall be isolated with an approved durable nylon washer, gasket, or other approved isolation material to prevent corrosion, except that isolation material shall not be used between an aluminum signal or sign hanger and steel sign pole.
- D. Galvanizing shall conform to VDOT *Road and Bridge Specifications*, Section 233.
- E. Electrical items shall conform to VDOT *Road and Bridge Specifications*, Section 238.
- F. Wood for wooden posts and poles shall conform to VDOT *Road and Bridge Specifications*, Section 236 and shall be treated in accordance with VDOT *Road and Bridge Specifications*, Section 236. Wood items shall be cut to size or design before treatment.
- G. Steel for structural support of light poles and traffic control devices shall conform to VDOT *Road and Bridge Specifications*, Section 226 and shall be fabricated, welded, and inspected in accordance with VDOT *Road and Bridge Specifications*, Section 407.
- H. Anchor bolts shall be high strength steel conforming to VDOT *Road and Bridge Specifications*, Section 226 unless otherwise specified. The anchor bolts shall be galvanized except when stainless steel is specified in the Contract Documents. Anchor bolts shall be straight with ring and plate or nuts and washers attached to the end of the anchor bolts embedded in the concrete. J-bolts will not be permitted, except in the construction of controller cabinet foundations.
- I. Aluminum for fabricated items shall conform to VDOT *Road and Bridge Specifications*, Section 229 and shall be fabricated, welded, and inspected in accordance with VDOT *Road and Bridge Specifications*, Section 407.
- J. Breakaway support systems shall be tested and certified to conform to NCHRP Report 350, or be Manual for Assessing Safety Hardware (MASH) certified. The Contractor shall provide a certification letter stating the brands and models of breakaway systems planned for use have been tested and are in conformance with this requirement. Breakaway couplers shall not

be used. The following systems shall be used when breakaway supports are specified on the plans:

1. Frangible bases and skirt covers shall be aluminum.
2. Slip bases shall be galvanized steel or other approved noncorrosive metal.

K. Miscellaneous hardware shall be brass, bronze, stainless steel, or galvanized steel.

### 1.3 WORKING DRAWINGS

The Contractor shall submit to the Owner working drawings, including design calculations and catalog cuts, in accordance with the requirements of VDOT *Road and Bridge Specifications* Section 105

In lieu of working drawings and catalog cuts, the Contractor may submit a letter indicating the brands, types, and models, of equipment along with the approval numbers and contract item numbers. The Contractor shall include the words "Testing Required" with the approval numbers when materials testing is required for the equipment. The approval numbers shall be taken from VDOT's preapproved traffic control device lists. Inclusion of equipment on this list does not ensure acceptance if contract requirements prohibit use of the equipment.

## II. EXECUTION

The Contractor shall execute the Work in accordance with the latest edition of the VDOT *Road and Bridge Specifications*, Section 700.03, Procedures. Any references to "Engineer" or VDOT personnel shall mean the "Owner".

## III. MEASUREMENT FOR PAYMENT

- A. Concrete foundations will be measured in units of each or cubic yards of concrete as indicated on the Bid form. When paid for in cubic yards of concrete, no payment will be made for concrete in excess of the cubic yards of concrete required by the foundation design unless otherwise approved by the Owner. This price shall include foundation design, concrete, reinforcing steel, stub poles, anchor bolts, bolt circle templates, grounding equipment, conduits, excavating, backfilling, compacting, disposing of surplus and unsuitable material, and restoring existing areas.
- B. Electrical service will be measured in units of each and will be paid for the contract unit price per each. This price shall include service poles, safety switches or breaker boxes, service entrance conductor cables from the utility company's service box conductor to the safety switch and circuit breaker box, conduit and fittings on poles and steel supports, conduit straps or clamps, meter bases, service entrance heads, thimbleye bolts, steel supports, wireway, junction boxes for grounding electrodes and utility service, excavation, concrete, and pickup and installation of meter base and current transformer cabinet.
- C. Luminaire arms will be measured in units of each and will be paid for at the contract unit price per each. This price shall include pole mounting brackets, fittings, and mounting hardware. These prices shall also include providing the required finish.
- D. Lighting poles will be measured in units of each and will be paid for at the contract unit price per each. This price shall include pole shafts, luminaire arms, grounding lugs, hand holes

and covers, caps, identification tags, anchor bases, bolt covers, bracket arms, and breakaway support systems. These prices shall also include providing the required finish.

- E. Signal poles will be measured in units of each and will be paid for at the contract unit price per each. This price shall include pole shafts, mast arms, grounding lugs, hand holes, and covers, caps, fittings, anchor bases, bolt covers, and identification tags. These prices shall also include providing the required finish.
- F. Overhead and bridge-mounted sign structures will be measured in units of each and will be paid for at the contract unit price per each. This price shall include structural units and supports, hand holes and covers, grounding lugs, walkways and handrails, electrical systems including conduit and fittings, and identification tags. These prices shall also include providing the required finish.
- G. Sign posts will be measured in linear feet and will be paid for at the contract unit price per linear foot. This price shall include clamps, identification tags, and breakaway base assemblies.
- H. Pedestal poles will be measured in units of each and will be paid for at the contract unit price per each. This price shall include caps, breakaway support systems, hand holes and covers, grounding lugs, identification tags, and anchor bases and bolt covers. These prices shall also include providing the required finish.
- I. Wood poles will be measured in units of each and will be paid for at the contract unit price per each. This price shall include thimbleye bolts, guy wires with guards and anchors, excavating, backfilling, compacting, disposing of surplus and unsuitable material, and restoring existing areas.
- J. Conductor cables will be measured in linear feet and will be paid for at the contract unit price per linear foot. This price shall include conductors, breakaway connections, markings and identifications; splice kits, electrical tape, testing, and connections.
- K. Conduit will be measured in linear feet and will be paid for at the contract unit price per linear foot. This price shall include conduit bodies, fittings, bonding systems, pull ropes, plastic spacers, No. 8 locator wire when required, pull or splice boxes with an area of 512 cubic inches or less, supports, and protective metal shields.
- L. Trench excavation will be measured in linear feet and will be paid for at the contract unit price per linear foot. This price shall include trenching, encasing, backfilling, locator tape, compacting, disposing of surplus and unsuitable material, and restoring existing areas.
- M. Junction boxes will be measured in units of each and will be paid for at the contract unit price per each. This price shall include concrete collars, frames and covers, tools to remove the cover, ground rods, ground conductors, grounding lugs, knockouts, cable racks, aggregate, excavating, backfilling, compacting, disposing of surplus and unsuitable material, and restoring existing areas. These prices shall also include providing the required finish.
- N. Test bores will be measured in units of each and will be paid for at the contract unit price per each. This price shall include the test bore, rock sampling, and determination of the soil and rock condition.
- O. Electrical service grounding electrode will be measured in units of each, per 10-foot

electrode or portion thereof, and will be paid for at the contract unit price per each. This price shall include testing, exothermic welds, grounding electrode(s), electrode couplers, grounding conductor, and report documentation.

P. Bored conduit will be measured in units of linear feet and will be paid for at the contract unit price per linear foot for the size specified. The price shall include conduit; fittings; couplings; and, when required, No. 8 locator wire, bonding systems, and pull rope or tape.

Q. VA sign structure foundations will be measured in units of each and will be paid for at the contract unit price per each for the size specified. No payment will be made for concrete in excess of the cubic yards of concrete required by the foundation design unless otherwise approved by the Engineer. When excess concrete is approved by the Engineer, the additional concrete will be paid for in cubic yards for the invoice material cost only. This price shall include concrete, reinforcing steel, excavating, backfilling, compacting, disposing of surplus and unsuitable material, and restoring disturbed areas.

R. VIA sign structure foundations will be measured in units of each and will be paid for at the contract unit price per each for the size specified. No payment will be made for concrete in excess of the cubic yards of concrete required by the foundation design unless otherwise approved by the Engineer. When excess concrete is approved by the Engineer, the additional concrete will be paid for in cubic yards for the invoice material cost only. This price shall include concrete, reinforcing steel, excavating, backfilling, compacting, disposing of surplus and unsuitable material, and restoring disturbed areas.

S. Square tube post foundations will be measured in units of each and will be paid for at the contract unit price per each for the type specified. This price shall include anchor sleeve, post sleeve, slip base assembly, soil stabilizing plate, drive tube foundation, concrete, hardware, excavating, backfilling, compacting, disposing of surplus and unsuitable material, and restoring disturbed areas.

T. Electrical service work pads will be measured in units of each and will be paid for at the contract unit price per each. This price shall include concrete, excavating, disposing of unsuitable material and restoring the disturbed area.

U. Mast arms will be measured in units of each and will be paid for at the contract unit price per each for the length specified. The price bid shall include providing design and shop drawings, mast arms including mast arms caps, galvanization, fittings, nuts, bolts, washers, field drilling of wire outlet holes and rubber gaskets or grommets, field adjustment of arm lengths, and identification tags.

V. VA sign posts will be measured in linear feet for the size specified and will be paid for at the contract unit price per linear foot for the size specified. This price shall include posts, clamps, identification tags, foundation stub post, and breakaway base assemblies.

W. VIA sign posts will be measured in linear feet for the size specified and will be paid for at the contract unit price per linear foot for the size specified. This price shall include posts, clamps, identification tags, foundation stub post, breakaway base assemblies, hinge plate assemblies and fuse plate assemblies.

End of Section