Downloaded from http://www.everyspec.com

INCH-POUND

A-A-55804
March 11, 1996
SUPERSEDING
W-R-550
October 7, 1975

COMMERCIAL ITEM DESCRIPTION

RODS, GROUND (WITH ATTACHMENTS)

The General Services Administration has authorized the use of this Commercial Item Description as a replacement for W-R-550, which is canceled.

1. SCOPE. This description covers grounding electrodes with connecting cables and provisions for securing attachments to exposed noncurrent-carrying conductive materials of electrical equipment in mobile shops and temporary or permanent power stations, and to establish grounds in areas devoid of underground metallic water-piping systems.

2. CLASSIFICATION. The ground rods shall conform to the following types and classes (see 7.4).

Type I - Auger Rod (Figure 1)
  Class A - Galvanized

Type II - Driven Rod (Figure 2)
  Class A - Galvanized
  Class B - Copper-cladding

Type III - Sectional Rod (Figure 3)
  Class B - Copper-cladding
  Type IV - Driven Head (Figure 4)

Beneficial comments, recommen dations, additions, deletions, clarifications, etc. and any other data which may improve this document should be sent by letter to: Commander, Defense Supply Center Richmond, Attn: DSCR-VCA, 8000 Jefferson Davis Highway, Richmond, VA 23297-5610.

AMSC N/A FSC 5975

Distribution Statement A . Approved for public release; distribution is unlimited.

Downloaded from http://www.everyspec.com

Class A - Galvanized

3. SALIENT CHARACTERISTICS

3.1 Materials. Materials shall be as specified herein and in the applicable figures. Materials not specified shall be subject to the requirements of this description.

3.2 Threads. All threads shall be of readily accepted commercial sizes. Type III rods shall have 5/8-11-UNC-2A or 3/4-10-UNC-2A threads. The coupling threads shall be as specified in Figure 5.

3.3 Rods. The ground rod assemblies shall be in accordance with NFPA Code Number 70.

3.3.1 Class A rods. Class A rods shall be fabricated from steel conforming to ASTM A108, Grade 1020, 1022, or 1025 and shall have a hardness of Rockwell B 74 to 82. The rods shall be galvanized conforming to ASTM A153, Class A, and shall have a depth not less than 0.0034 inch.

3.3.2 Class B rods. Class B rods shall be fabricated from steel conforming to ASTM A108, Grade 1016, 1018, or 1020 and shall have a hardness of Rockwell B 90 to 100 with a copper cladding of not less than 0.010 inch conforming to ASTM B152.

3.3.3 Protective finishes. Metal surfaces of the rod and attachments that are exposed when in use, but are not inherently corrosion resistant, shall be finished to resist corrosion.

3.3.4 Type I rods. The Type I rod shall be 8 feet long $\pm$ 1 inch and 5/8 inch minimum diameter. It shall consist of a steel rod with an auger tip for ground insertion on one end and a "T" handle on the other end (see Figure 1). The “T” handle shall be steel and shall be attachable to the grounding portion of the rod at the center of the "T." The auger tip shall be steel, with a right-hand thread not less than 9 inches in length. The ratio of the pitch diameter to the major diameter of the flutes shall be approximately 1.4 to 1. The auger tip shall be integral with the rod or attached thereto by means of brazing or welding. The tip shall be heat-treated to a minimum hardness of Rockwell C 45.

3.3.5 Type II, Class A or Class B rods. The Type II rod shall be 8 feet $\pm$ 5/8 inch long and 5/8 +0 -5/64 inch diameter, or 8 feet $\pm$ 3/4 inch long and 5/8 +0 -5/64 inch diameter, or 10 feet long $\pm$ 1 inch and 3/4 inch +0 -5/64 diameter as specified in the order. These rods shall have a conical end for ground insertion and a flat end with a chamfer as shown in Figure 2. The ground insertion end shall be pointed without application of heat to retain original hardness of the metal. The conical point angle shall be 60 degrees, with a tolerance of $\pm$ 5 degrees. The chamfer shall be 30 degrees (see Figure 2).

Downloaded from http://www.everyspec.com

3.3.6 Type III, Class B rods. The Type III rod shall have three 3 foot ± 3/8 inch sections, 5/8 inch +0 -5/64 diameter, or four 5 foot ± 3/4 inch sections, 3/4 inch +0 -5/64 diameter, or two 5 foot ±3/4 inch sections, 3/4 inch +0 -5/64 diameter as specified in the order (see Figure 3).

3.3.7 Type IV, Class A rods. The Type IV rod shall be 8 feet ±1/2 inch long, 5/8 inch +0 -5/64 diameter (see Figure 4).

3.4 Fastening devices. All screws, pins, bolts, and similar parts shall be installed with means for adjustment and preventing loss of tightness.

3.5 Clamps. Clamps shall permit installation on the ground rod before or after the rod is inserted into the ground. To prevent electrolytic corrosion, the clamp body and parts shall be made of material compatible with the class of rod upon which they will be used.

3.5.1 Type I clamps. The clamp for Type I rods (see Figure 1) shall consist of a U-shaped yoke to accommodate a crossbar containing a threaded hole. A hex-head bolt to fit the threaded hole shall be used to apply pressure to the contact plate and clamp, producing a positive electrical connection without overstressing the material. The minimum size of the bolt shall be 5/16 inch. The minimum thickness of the clamp body shall be 1/8 inch.

3.5.2 Type II and III clamps. The clamp for the Type II and Type III rods (see Figures 2 and 3), shall have a one-piece assembly with a threaded hole and a hex-head cup set screw of 1/2 inch minimum diameter. The clamp shall be of sufficient size to allow it to be fitted over the ground rod. When mounted in place it shall provide a positive electrical connection with the rod and grounding cable.

3.5.3 Type IV clamps. The clamp for the Type IV rod shall have a 1/2 inch diameter thumbscrew, 20 threads per inch, and a washer (see Figure 4).

3.6 Ground cables. The overall cable length shall be 6 feet± 1 inch, unless otherwise specified in the order.

3.6.1 Type I grounding cables. Grounding cable for Type I shall consist of No. 10 wire size, rope stranded (7 strands), extra flexible bare copper wire or a strap of braided or woven copper wire equivalent to No. 6 wire size. A strap, if supplied, shall be not less than 3/4 inch and not more than 1 inch wide. The wire or braid shall be coated with tin, lead, or lead alloy. One end of the wire or braid shall be soldered or brazed to the yolk of the U-clamp and the opposite end shall be attached to the power clip (see Figure 1).

3.6.2 Type II, III and IV grounding cables. Grounding cables for Type II, III and IV rods shall consist of No. 6 wire size, flexible, bare stranded copper wire.

Downloaded from http://www.everyspec.com

3.7 Ground terminals.

3.7.1 Type I grounding terminals. The ground terminal for Type I rods shall be a clip such as W-C-440, type PC, with the proper current rating.

3.7.2 Type II, III and IV grounding terminals. The ground terminal lug for Types II, III and IV (see Figures 2,3 and 4) shall be an internal pressure bar type containing a threaded hole fitted with a filister head machine screw for tightening against the pressure bar. The terminal shall provide electrical contact with the cable without deformation or weakening of the connection. A flattened portion shall be provided on the terminal with minimum dimensions of 1/2inch long by 1/2 inch wide by 1/16 inch thick. This portion shall include a hole 9/32 inch $\pm$ 1/32 inch diameter.

3.8 Impact strength. The rod shall be capable of meeting the following impact requirement without shattering, becoming deformed, or otherwise physically damaged. With the ground rod in a vertical position and securely held in place by a suitable device placed 6 inches from the drive end of the rod, a 4-pound weight shall be dropped on the drive end of the rod from a height of 10 feet, 25 times.

3.9 Bending. The rod shall be capable of meeting the following bending requirements without showing evidence of cracking of the surface of the bent portion. At a temperature of 77 $\pm$ 9 degrees F, the rod shall be held in a suitable rigid clamp or vise and the free end bent by applying a force normal to the rod at a distance of 40 rod diameters $\pm$ 1/32 inch from the clamping device. The normal force shall be applied until a permanent angular bend of 30 degrees is attained.

3.10 Clamp and grounding cable attachment. The clamp with the grounding cable attached to the rod shall be capable of withstanding a 150 pound pull on the cable for five minutes in a direction parallel to the axis of the rod, without slippage of the clamp or cable.

3.11 Contact resistance. The contact resistance between the terminal connection and the ground rod shall not exceed 0.005 ohm.

3.12 Workmanship. All ground rods and component accessories shall be free of burrs and sharp edges. Welds shall be free of fissures and lack of fusion with the parent metals. Metal coatings shall be free of pits and voids.

4. REGULATORY REQUIREMENTS

4.1 Recovered materials. The offeror/contractor is encouraged to use recovered materials to the maximum extent practicable, in accordance with paragraph 23.403 of the Federal Acquisition Regulation (FAR).

Downloaded from http://www.everyspec.com

4.2 Metric products. Products manufactured to metric dimensions will be considered on an equal basis with those manufactured using inch-pound units, provided they fall within specified tolerances using conversion tables contained in the latest version of Federal Standard No. 376, and all other requirements of this Commercial Item Description are met. If a product is manufactured to metric dimensions and those dimensions exceed the tolerances specified in the inch/pound units, a request should be made to the contracting officer to determine if the product is acceptable. The contracting officer has the option of accepting or rejecting the product.

5. QUALITY ASSURANCE PROVISIONS

5.1 Contractor certification. The contractor shall certify and maintain substantiating evidence that the product offered meets the salient characteristics of this Commercial Item Description, and that the product conforms to the producer's own drawings, specifications, standards, and quality assurance practices. The government reserves the right to require proof of such conformance prior to first delivery, and thereafter, as may be otherwise provided under the provisions of the contract.

6. PACKAGING.

Preservation, packaging, packing and marking for shipment shall be in accordance with American Society for Testing and Materials (ASTM) D 3951 or as specified in the contract or order.

7. NOTES

7.1 Intended use. Ground rods are intended to be used as safety devices to minimize the possibility of injury to personnel and reduce fire hazards by providing a temporary connection for grounding exposed, noncurrent carrying conductive materials of electrical equipment. The Type I rod provides a temporary connection for grounding the body or frame of mobile shops and electrical equipment, and Type II rods provide a temporary installation for signal lines, power stations and substations.

7.2 Addresses for obtaining referenced documents.

NFPA No. 70 - National Electrical Code
National Fire Protection Association
60 Batterymarch Street
Boston, MA 02110

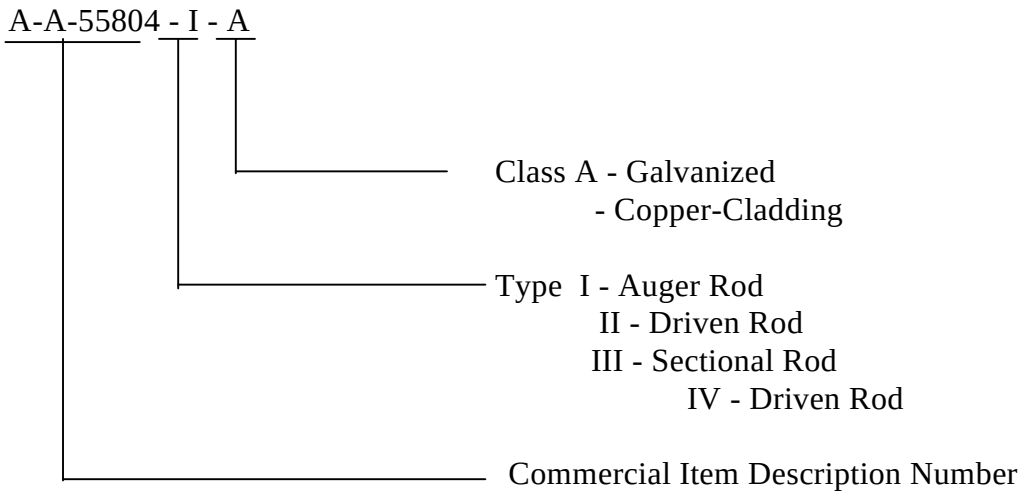
ASTM A108, B152, B153, D3951
American Society for Testing and Materials
1916 Race Street

Downloaded from http://www.everyspec.com

Philadelphia, PA 19103

W-C-440 Clips, Electrical, General Specification for
DoDSSP
Standardization Document Order Desk
700 Robbins Avenue
Building #4, Section D
Philadelphia, PA 19111-5094

7.3 Part identification number (PIN). The following part identification numbering procedure is for government purposes and does not constitute a requirement for the contractor.



7.4 Ordering data.

a) Title, number, and date of this description.
b) Type and class of rod (see 2.0).
c) Length of rod (see 3.3.5 and 3.3.6).
d) Length of ground cable if other than specified (see 3.6).
e) Special packaging requirements (specify).
f) The contracting officer may require contractor certification that the product offered meets the quality assurance provisions (see 5.1).

Downloaded from http://www.everyspec.com

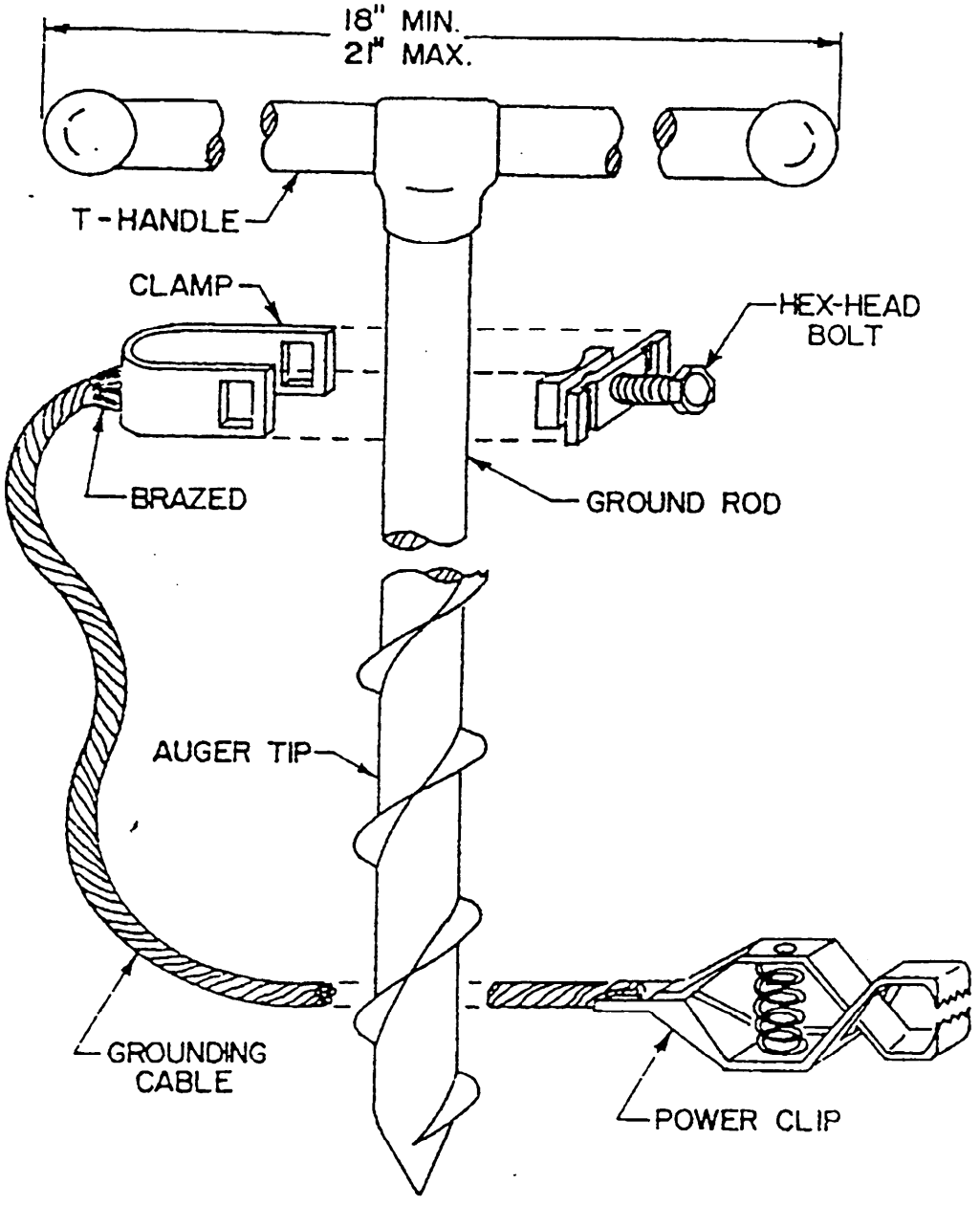


Figure 1. Type I Class A, Auger Rod

Downloaded from http://www.everyspec.com

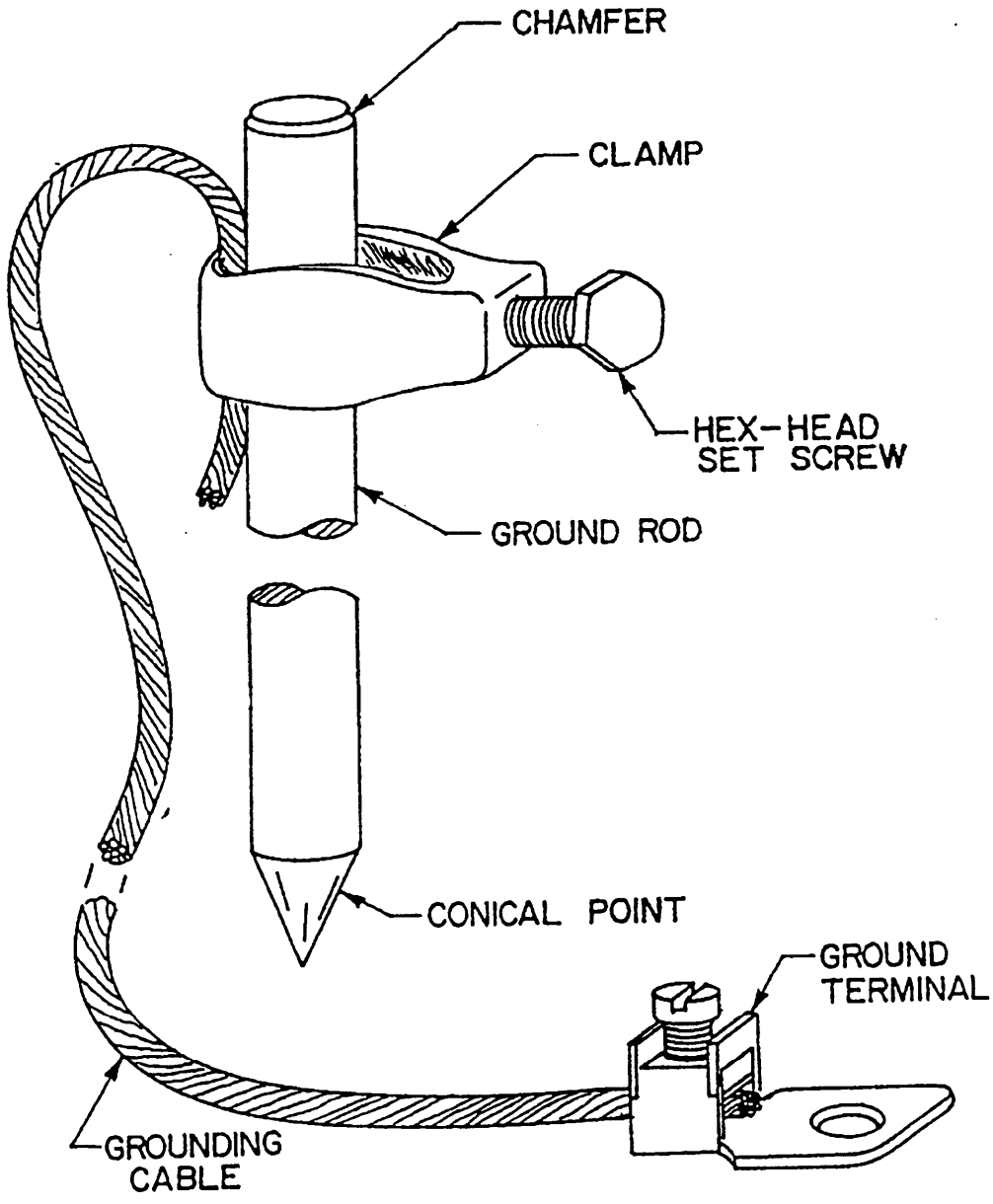


Figure 2. Type II, Class A or B, driven rod

Downloaded from http://www.everyspec.com

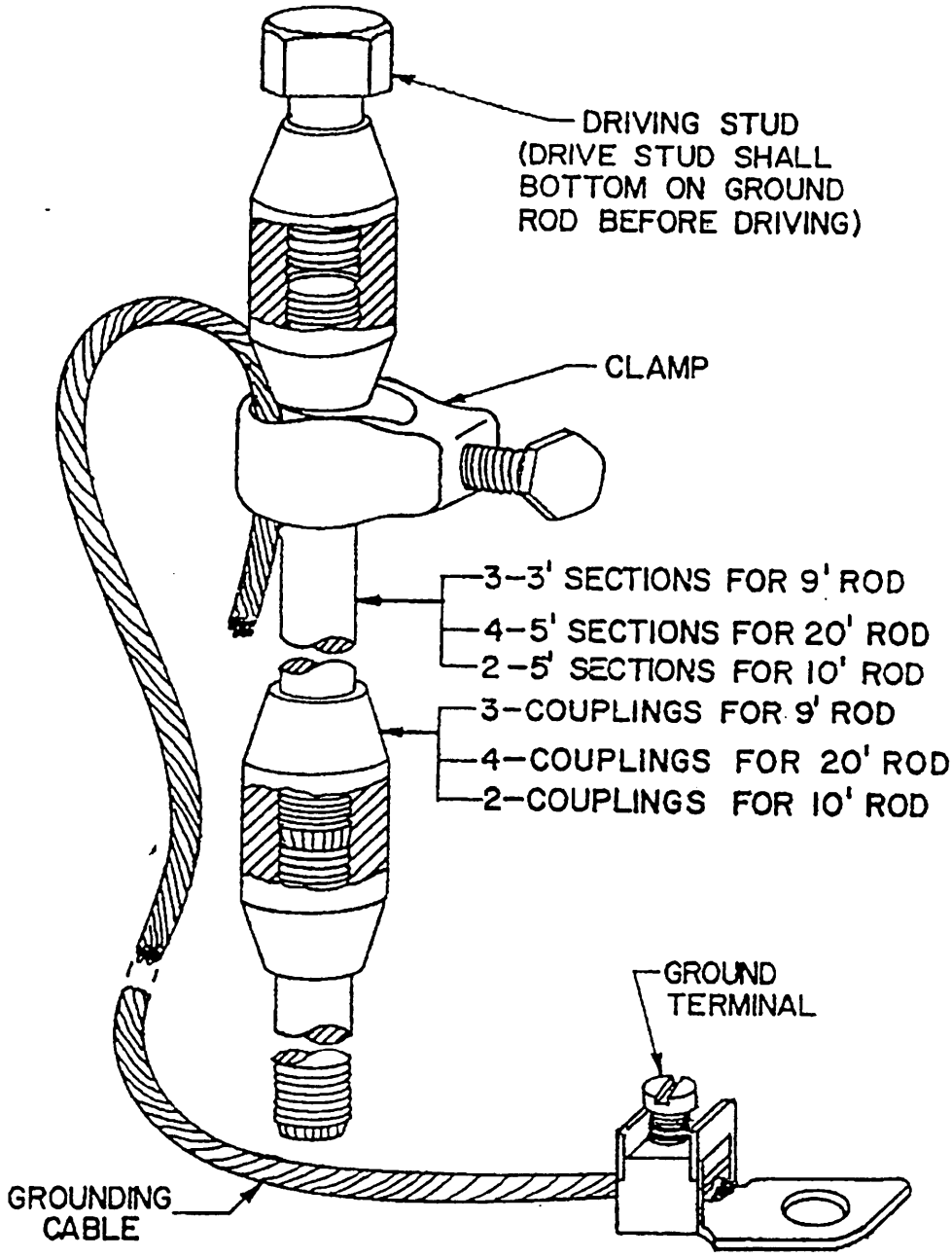


Figure 3. Type III, Class B, sectional rod

Downloaded from http://www.everyspec.com

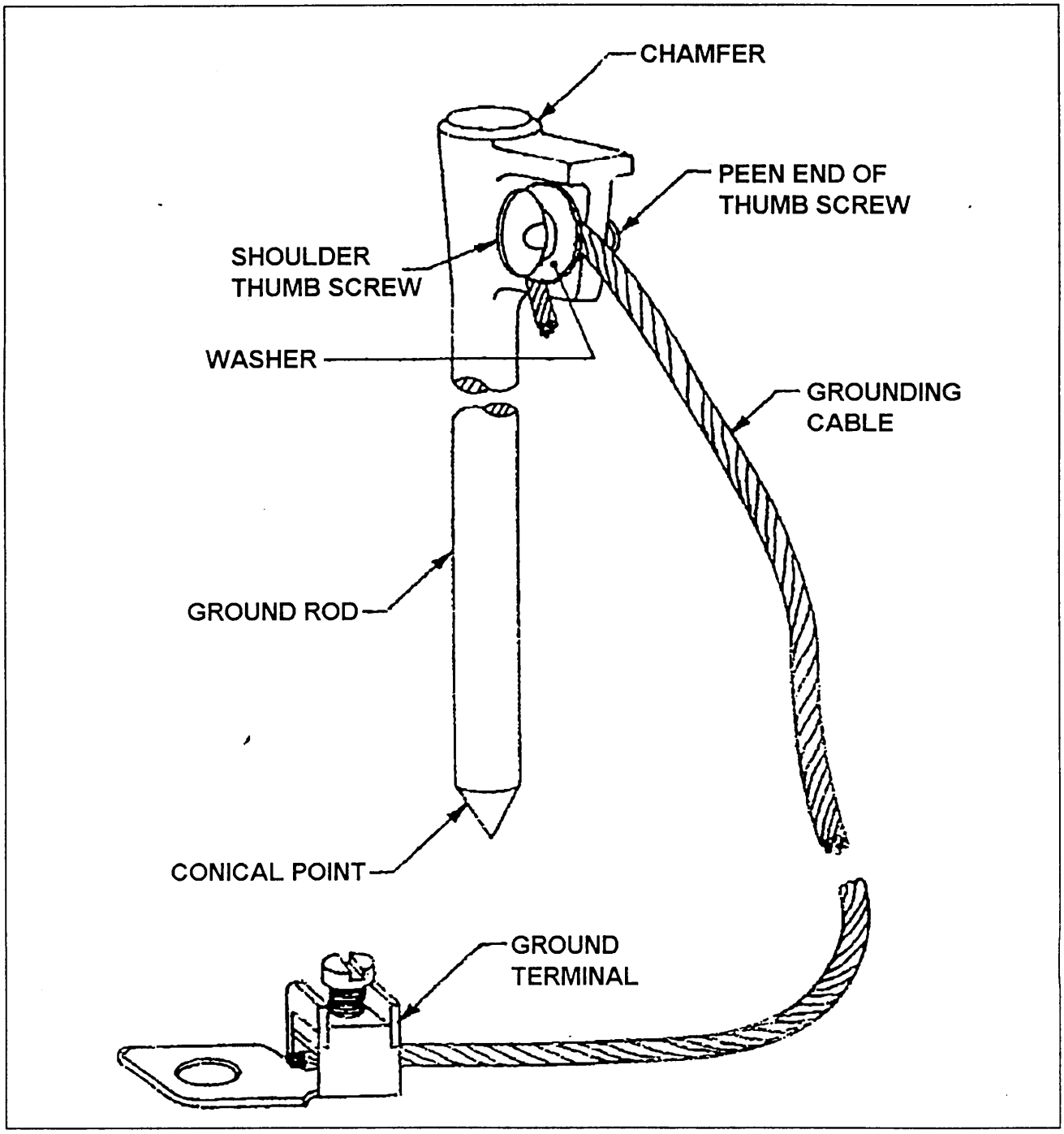
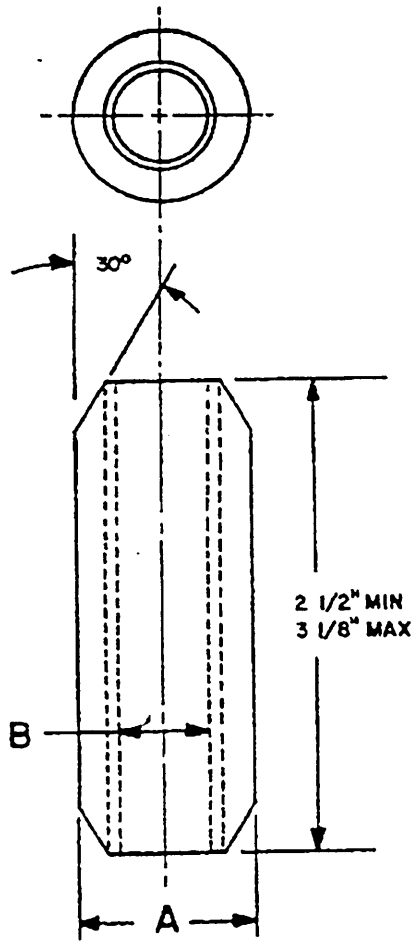


Figure 4. Type IV, Class A, Drive Head Rod

Downloaded from http://www.everyspec.com



	A	B
FOR 5/8" ROD	7/8"	5/8 – 11 UNC – 2B
FOR 3/4" ROD	1"	3/4 – 10 UNC – 2B

MATERIAL: COPPER ALLOY NO. 655, HIGH SILICON BRONZE; 1/4 HARD TEMPER CONDITION, ROCKWELL B80 HARDNESS.

Figure 5. Coupling for Type III, Class B, sectional rod

Downloaded from http://www.everyspec.com

MILITARY INTERESTS:

Custodians
Army - ME
Air Force - 85

Reviewers
Army - AR, CR, MI
Air Force - 99, 11
Navy - MC

CIVIL AGENCY COORDINATING ACTIVITY:
GSA - FSS

PREPARING ACTIVITY:
DLA - GS

Project No.: 5975-1133