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Superseding

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MILITARY SPECIFICATION

TOWER AND EXTENSION, AERIAL NAVIGATION BEACON

This specification has been approved by the Departments of the Army, the Navy, and the Air Force.

1. SCOPE

1.1 Scope.-- This specification covers beacon towers intended for use by the Services and the Civil Aeronautics Administration as supporting structures for lights identifying airdromes, airways, emergency fields, and high-intensity approach light lanes.

1.2 Classification.-- The beacon towers shall be of one type and the following heights, as specified:

- (a) 51 feet
- (b) 62 feet
- (c) 75 feet
- (d) 91 feet
- (e) 108 feet
- (f) 129 feet
- (g) 152 feet

2. APPLICABLE SPECIFICATIONS, STANDARDS, DRAWINGS, AND PUBLICATIONS

2.1 The following specifications, standard, drawings, and publication, of the issue in effect on date of invitation for bids, form a part of this specification:

SPECIFICATIONS

Federal

FF-B-571	Bolts, Nuts, Studs, and Tap Rivets (And Material for Same)
QQ-S-741	Steel; Structural, (Including Welding) and Rivet (for) Bridges and Buildings
RR-G-661	Gratings; Steel Floor (Except for Naval Vessels)
TT-P-641	Primer; Paint, Zinc Dust-Zinc Oxide (For Galvanized (Zinc-Coated) or Zinc Surfaces)

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STANDARDS

MIL-STD-129

Marking of Shipments

DRAWINGSCivil Aeronautics Administration Drawings (AN Aeronautical Standard Issue of)

D-3000-5	Airways Beacon Tower - Form 7A - Erection Diagram
D-3000-7	Airways Beacon Tower, Forms 7 and 7A, Erection of Modified Parts (Base Panel Only)
D-3001-1	Airways Beacon Tower - Form 7A - Material List - Shop Details
D-3001-2	Airways Beacon Tower - Form 7A - Shop Details
D-3001-3	Airways Beacon Tower - Form 7A - Shop Details
D-3001-4	Airways Beacon Tower - Form 7A - Shop Details
D-3001-6	Airways Beacon Tower - Form 7A - Shop Details
D-3001-7	Airways Beacon Tower - Form 7A - Shop Details
D-3001-8	Airways Beacon Tower - Form 7A - Shop Details
D-3001-9	Airways Beacon Tower - Form 7A - Shop Details
D-3001-10	Airways Beacon Tower - Form 7A - Shop Details
D-3001-11	Airways Beacon Tower - Form 7A - Shop Details
D-3001-12	Airways Beacon Tower - Form 7A - Shop Details
D-3001-13	Airways Beacon Tower - Form 7A - Shop Details
D-3001-14	Airways Beacon Tower - Form 7A - Shop Details
D-3001-18	Airways Beacon Tower, Forms 7 and 7A, Details of New and Modified Parts
D-4513-1	Internally Lighted Wind Cone Retractable Type Assembly
D-4513-2	Internally Lighted Wind Cone Retractable Type Collector Ring Assembly
D-4513-3	Internally Lighted Wind Cone Retractable Type Collector Ring Details
D-4513-4	Internally Lighted Wind Cone Retractable Type Details
D-4513-5	Internally Lighted Wind Cone Retractable Type Tower Platform
D-4772-17	Single Row High Intensity Approach Light System Steel Platform - Erection Diagram (Modified 7A Tower)
D-4772-18	Single Row High Intensity Approach Light System Steel Platform - Details New Parts (Modified 7A Tower)
D-4772-19	Single Row High Intensity Approach Light System Steel Platform - Details Modified Parts (Modified 7A Tower)
D-4839	Airways Beacon Tower Form 6, 7, and 7A Concrete Foundations
E-3000-1	Airways Beacon Tower - Form 7A - Erection Diagram
E-3000-2	Airways Beacon Tower - Form 7A - Erection Diagram
E-3000-3	Airways Beacon Tower - Form 7A - Erection Diagram
E-3000-4	Airways Beacon Tower - Form 7A - Erection Diagram

PUBLICATIONSAir Force-Navy Aeronautical Bulletin

No. 143

Specifications and Standards; Use of

(Copies of specifications, standards, and drawings required by contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

3. REQUIREMENTS

3.1 Materials.-

3.1.1 Steel.- The structural steel required for tower construction, unless otherwise specified, shall conform to Specification QQ-S-741.

3.1.2 Selection of materials.- Specifications and standards for all materials, parts, and Government certification and approval of processes and equipment, which are not specifically designated herein and which are necessary for the execution of this specification, shall be selected in accordance with ANA Bulletin No. 143.

3.2 Design and construction.-

3.2.1 Basic tower.- The basic tower shall consist of a structure approximately 51 feet high above ground. Anchor posts, anchor post assemblies, "C" girts, "B" girts, and sign-mounting straps, shall be omitted when the basic tower is to be used with an extension to form a tower higher than 51 feet.

3.2.2 Extensions.- Extensions of approximately 11, 24, 40, 57, 78, or 101 feet, shall be used with the basic tower to make up a complete tower of approximately 62, 75, 91, 108, 129, or 152 feet in height above ground, as specified by the procuring activity. Extensions shall include anchor posts, anchor-post assemblies, "C" girts, "A" and "B" girts, and sign-mounting straps, as shown on the drawings for the resulting height of tower.

3.2.3 Ladder.- Each tower shall be provided with a ladder and connections as shown on the drawings. The top of each ladder section shall telescope into the bottom of the section above. Rungs shall be formed as shown on the drawings. Sections shall be straight and true to form after fabrication.

3.2.3.1 Two short ladder side pieces at the ground, LSL and LSR, are required per tower, except as part of the basic tower without footings for use with extensions.

3.2.3.2 A ladder cage shall be furnished as a part of all towers 91 feet or more in height.

3.2.4 Platform.- A platform approximately 7 feet square with rails and gratings, shall be supplied as a part of each tower. The railings shall be punched to permit mounting a T cabinet on any inner face. The gratings shall conform to Specification RR-G-661, type I, class B, and shall be of rectangular pattern. The grating shall be fitted to avoid interference with bolt heads and nuts on the tower when in place, but no bearing bar shall be slotted, coped, or cut below the neutral axis.

3.2.4.1 When the tower is used for a high intensity approach light system, a platform approximately 7 feet by 14 feet with rails and grating in accordance with Drawings D-4772-17, D-4772-18, and D-4772-19, shall be supplied in lieu of the standard 7- by 7-foot platform.

3.2.5 Optional equipment.- The following equipment is to be furnished only when specifically designated in the contract or purchase order:

- (a) Wind Cone Bracket: The wind cone bracket shall conform to the applicable drawings as listed on table I. The bracket shall be complete with plant, pivot, clamps, nuts, and bolts for attaching to the tower, and other accessories as shown on the drawings and provided in the material list. The plant shall be air- or kiln-dry (20 percent maximum moisture content) grade C select lumber treated as specified on the drawings.

(b) Oversize Foundation Plates: For use when towers are erected in soft ground, special foundation plates of various sizes as shown on Drawing D-3001-13 may be required for bolting to the bottom of the standard anchor plates. These auxiliary plates shall be furnished complete with four 1- by 2-inch bolts. When the tower is used for a high intensity approach light system, the foundation shall be in accordance with Drawing D-4839.

3.3 Drawings and design.- All parts shall be fabricated in accordance with the drawings to provide interchangeability of parts. The drawings applicable to each tower or extension are shown in table I.

3.4 Bolts and nuts.- Bolts and nuts shall be in accordance with Specification FF-B-571, Type A1; Class 1 loose fit; Class B steel or better; hot dip galvanized.

3.4.1 The number of bolts, nuts, locknuts, and washers, shown on the material list, shall be shipped with each tower or extension.

3.4.2 Locknuts shall be similar to and equal in quality and action to "Palnuts" (the Palnut Company, Irvington, New Jersey). The locknuts shall be packaged according to size and included with each shipment of bolts.

3.4.3 Bolts and nuts 1/4 of an inch or less in diameter and locknuts, may be cadmium- or zinc-plated 0.00025 inch minimum thickness in lieu of hot-dip galvanizing.

3.5 Galvanizing.- All steel shapes shall be hot-dip galvanized after fabrication. The weight of zinc coating shall be not less than 2 ounces per square foot. The parts shall be free from mill scale and foreign matter and shall be thoroughly, uniformly, and evenly coated in a bath containing not less than 98 percent pure zinc. Coatings shall be adherent, continuous, and smooth, and shall not flake or peel when scraped with the point of a sharp knife. The parts shall be free from fins, drops, or lumps of zinc which might affect the proper fit of parts, bare or improperly coated spots, abrasions, adhesions of foreign matter, and other injurious defects.

3.6 Painting.- All metal to be placed below ground level or within 12 inches above ground level, shall be given one coat of black asphalt paint or water-gas tar followed by a coat of coal-gas tar paint. Before painting, galvanized surfaces shall be given one coat of zinc dust-zinc oxide primer conforming to Specification TT-P-641.

3.7 Piece marks.- Each separate piece and each part of a shop subassembly shall be marked as shown on the erection drawings. The marking shall be stamped into the steel before galvanizing in such a manner that the marks will be clearly visible after galvanizing. Like pieces shall be marked in the same relative position; and for parts extending above ground, in a location visible when the part is in place on the tower.

3.8 List of material.- The towers shall be furnished complete in accordance with the material list, which includes an excess of not less than 15 percent of bolts, nuts, etc, and also special fastenings for appurtenances; provided that any item required for a complete unit shown on the drawing or specified herein but omitted from the material list, shall also be furnished as a part of the tower. The contractor shall bring to the attention of the procuring activity any errors or omissions found in the material list and shall not furnish a lesser quantity than that shown in the material list without prior approval of the procuring activity.

3.9 Instructions.-

3.9.1 General instructions.- Unless otherwise specified, two copies satisfactory for reproduction (manuscript if desired) of instructions covering installation, maintenance, and overhaul of the beacon tower shall be furnished with each order. The copies shall be prepared on 8-1/2 by 11-inch white paper. Black lettering and lines shall be used. These

instructions shall be furnished to the procuring activity prior to the delivery of any beacon towers. In addition, five printed copies of the instructions shall be furnished with each beacon tower. One copy shall be inclosed in a suitable waterproof envelope or case and shipped with each beacon tower; the remaining copies shall be furnished to the procuring activity prior to the delivery of any beacon towers.

3.9.1.1 Installation section.- All information necessary for the installation of the beacon tower shall be incorporated in the instructions. A mounting diagram shall be included. All holes to be drilled shall be specified by drill size and diameter in inches. A view showing interference dimensions shall be included. These instructions shall be such that the foundation may be made and the tower erected satisfactorily and economically with common labor.

3.9.1.2 Maintenance section.- The maintenance section shall include all necessary information on the care and upkeep of the beacon tower. Important cautions, where necessary, should be printed in distinctive letters.

3.9.2 Two copies of the manual of instructions and set of drawings shall be furnished to the procuring activity for approval, prior to the delivery of any beacon towers.

3.10 Workmanship.- Workmanship shall be in accordance with high-grade commercial practice covering this type of equipment.

4. SAMPLING, INSPECTION, AND TEST PROCEDURES

4.1 General.- All the tests required herein for the testing of towers and extensions are classified as Inspection tests, for which necessary sampling techniques and methods of testing are specified in this section.

4.2 Tests.- Each tower shall be inspected to determine conformance with the requirements specified herein and on the drawings.

4.3 Rejection and retest.- Only complete towers are acceptable under this specification. Rejection of any part shall be cause for rejection of the whole tower until such parts are repaired or replaced with parts meeting the requirements. Parts rejected after retest shall not be resubmitted without the specific approval of the procuring activity.

5. PREPARATION FOR DELIVERY

5.1 Application.- The requirements specified in Section 5 apply only to direct purchases by or direct shipments to the Government.

5.2 Packing.- Tower parts shall be packed in commercial containers so constructed as to insure acceptance by common or other carriers, for safe transportation, at the lowest rate, to the point of delivery. Pieces of structure 2 feet or less in length shall be packed in suitable boxes. Pieces of structure longer than 2 feet shall be packed in convenient size bundles.

5.2.1 Hardware, bolts, screws, hinges, washers, etc, shall be packed in suitable boxes.

5.3 Marking of shipments.- Interior packages and exterior shipping containers shall be marked in accordance with Standard MIL-STD-129. The nomenclature shall be as follows: Tower, Aerial Navigation Beacon, _____ Feet High, Steel, Painted Finish, Square Shape, Specification MIL-T-8637, Federal Stock No. ____*____ (if no FSN available, leave space therefor).

*Information to be entered by the manufacturer.

6. NOTES

6.1 Intended use.- The towers and extensions covered by this specification are intended for use by the Services and by the Civil Aeronautics Administration as supporting structures for lights identifying airdromes, airways, emergency fields, and high-intensity approach light lanes.

6.2 Ordering data.- Requisitions, contracts, and orders should state the height tower desired and any of the optional equipment desired.

NOTICE: When Government drawings, specifications, or other data are used for any purpose other than in connection with a definitely related Government procurement operation, the United States Government thereby incurs no responsibility nor any obligation whatsoever; and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data, is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

Custodians:

Navy - Bureau of Aeronautics
Air Force