

OCEAN ENGINEERING DIVISION
UNITED STATES COAST GUARD
WASHINGTON, D.C.

MARCH 2000

SPECIFICATION FOR FABRICATION
OF
CONCRETE BUOY SINKERS

SPECIFICATION NO. 407

REVISION A

1. SCOPE

1.1 Scope. This specification defines the requirements for the fabrication of concrete buoy sinkers used for anchoring Aids to Navigation buoys.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are referenced in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification which are recommended for additional information or used as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements cited in sections 3 and 4 of this specification, whether or not the referenced documents are listed here.

2.2 Industry Publications. The following documents of the issues specified form a part of this specification to the extent referenced herein. Suffixes denoting the specific issue of each document will be omitted from future references to the document in this specification.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

A36-97ae1	Standard Specification for Structural Steel
C33-99ae1	Standard Specification for Concrete Aggregates
C143-98	Standard Test Method for Slump of Hydraulic Cement Concrete
C150-99a	Standard Specification for Portland Cement

AMERICAN CONCRETE INSTITUTE (ACI)

318-99	Building Code Requirements for Structural Concrete & Commentary
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AMERICAN SOCIETY FOR QUALITY CONTROL

ANSI/ASQC Q9002-1994	Quality Systems - Model for Quality Assurance in Production, Inspection, and Servicing
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2.3 Drawings. The latest revision of the following United States Coast Guard Ocean Engineering drawing forms a part of this specification to the extent referenced herein, and shall be referred to as "the drawing" throughout this specification:

<u>Drawing Number</u>	<u>Title</u>
121068	Buoy Sinker

2.4 Source of Documents. The documents may be obtained from the following sources:

Industry Publications.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)
1916 Race Street
Philadelphia, PA 19103-1187

AMERICAN CONCRETE INSTITUTE (ACI)
PO Box 9094
Farmington Hills, MI 48333

AMERICAN SOCIETY FOR QUALITY CONTROL (ASQC)
310 West Wisconsin Avenue
Milwaukee, Wisconsin 53203

2.5 Precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 First Article Inspection. When specified (paragraph 6.1), concrete buoy sinkers shall be subjected to first article inspection in accordance with paragraph 4.3.

3.2 Materials.

3.2.1 Cement. Cement used in the concrete mixture shall meet the requirements of ASTM C150, Type 1.

3.2.2 Aggregate.

3.2.2.1 Coarse Aggregate. Coarse aggregate shall be uniformly graded from 1½ inch diameter to No. 4 sieve and shall meet the requirements of ASTM C33

3.2.2.2 Fine Aggregate. Fine aggregate shall be uniformly graded from No. 4 to No. 100 sieve and shall meet the requirements of ASTM C33.

3.2.3 Steel. Steel bars used for sinker bails shall meet the requirements of ASTM A36.

3.3 Design and Construction.

3.3.1 Design, Dimensions, and Dimensional Tolerances. All items shall conform to the design, dimensions, and tolerances shown in the drawing.

3.3.2 Concrete. Concrete shall have a 28-day compressive strength of at least 3000 psi and a slump between 2 and 4 inches.

3.3.3 Concrete Mix. The concrete mix shall be proportioned by volume as follows: 1 part cement, 2 parts fine aggregate, 4 parts coarse aggregate. Water shall be 6 gallons per 1 cubic foot (94 lb. sack) of cement.

3.3.4 Fabrication. Fabrication of sinkers shall be in accordance with ACI 318-99.

3.5 Marking. Each sinker shall be inscribed with its nominal weight (as indicated on the drawing). The nominal weight shall be inscribed with 2-inch high numerals on the top surface.

3.8 Documentation.

3.8.1 Material Certifications. When requested by the COTR, the Contractor shall furnish material certifications, either from the material manufacturers or an independent testing laboratory, to the effect that all of the material described in paragraphs 3.2.1 through 3.2.3 have been tested and found to meet the requirements of the applicable sections of this specification. The material certifications shall be stored by the Contractor for the life of the contract.

3.8.2 Material Inspection and Receiving Report (DD Form 250). A form DD-250 shall be used as a certification of product quality assurance, as a packing list, and as a certification of acceptance. The Contractor shall prepare a separate DD-250 for each shipping lot. Prior to shipment, the DD-250 must be signed by the COTR.

4. VERIFICATION

4.1 General. The Contractor's quality assurance program shall meet the requirements of ANSI/ASQC Q9002. However, the Contractor does not have to be Q9002 certified.

4.2 Classification of Inspections. The inspection requirements specified herein are classified as follows:

- a. First article inspection (paragraph 4.3)
- b. Contractor production inspection (paragraph 4.4)
- c. Coast Guard production inspection (paragraph 4.5)

4.3 First Article Inspection. When first article samples are required (see paragraphs 3.1 and 6.1), the Contractor shall perform a first article inspection in accordance with paragraph 4.6.

4.3.1 First Article Tests and Inspections Notification. The Contractor shall notify the Contracting Officer in writing at least 7 calendar days prior to the scheduled commencement of any inspections and tests required by this specification.

4.3.2 Waiver of First Article Requirements. The Contracting Officer reserves the right to waive all or part of the first article requirements specified herein.

4.3.3 Rejection Criteria. The results of the first article inspection will be reviewed by the Contracting Officer to determine compliance with the requirements of this specification. Failure of any of the tests or inspections described herein will be cause for rejection of the first article. If the first article is rejected, the Contractor will be notified in writing by the Contracting Officer and allowed 14 calendar days to fix or resubmit a new first article. Repair or replacement of the first article shall be by the Contractor at the Contractor's expense.

4.3.4 Authorization to Proceed. Upon successful completion of the first article inspection, the Contracting Officer will provide the Contractor with written authorization to begin

fabricating production quantities.

4.3.5 Standardization. Materials, parts, design, and fabrication methods used in the production quantities shall be identical to those used in the first articles, unless otherwise authorized in writing by the Contracting Officer.

4.4 Contractor Production Inspection. The tests and inspections required by this specification are not intended to supplant any controls, examinations, inspections, or tests normally employed by the Contractor to assure product quality. The Contractor shall perform the tests and inspections specified in paragraph 4.6 to ensure conformance to this specification. The Contractor shall provide space, personnel, and test equipment to conduct all inspection and test requirements.

4.5 Coast Guard Production Inspection. The Coast Guard reserves the right to observe, verify, or perform the tests and inspections outlined in paragraph 4.6.

4.6 Tests and Inspections. The following tests and inspections shall be conducted for each first article unit and subsequent production units:

- a. Visual inspection
- b. Documentation review

4.6.1 Visual Inspection. Each item shall be visually inspected for quality of workmanship and conformance to this specification and the drawing. The inspection shall include checks of dimensional conformance, weight, and marking.

4.6.1.1 Slump Test. Slump tests shall be in accordance with ASTM C143.

4.6.4 Documentation Review. The documentation required by paragraph 3.8 shall be reviewed for conformance with this specification and provided to the COTR upon request.

4.7 Rejection for Defects. The Coast Guard will reject all items which do not conform to the requirements of this specification. Repair or replacement of the rejected items shall be by the Contractor at the Contractor's expense. All rejected items shall be resubmitted for inspection only when they conform to the requirements of this specification. Resubmitted items shall be identified as such, and shall be kept separate from new items. If defective items are found, no further items will be accepted by the Coast Guard until the Contractor has demonstrated that the defects have been corrected and that the cause of the defects has been eliminated from the production process.

5. PACKAGING.

5.1 Packaging requirements are specified in Section D, Part I, Contract Schedule.

6. NOTES

6.1 First Article Inspection. The type and quantity of first articles required will be listed in Section B, Part I, Contract Schedule. A first article inspection shall be performed by the Contractor and at the Contractor's facility. The first articles shall meet the requirements of this specification and shall pass all the tests and inspections listed in paragraph 4.

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MARCH 2000

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3/6/00