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PERFORMANCE BASED PURCHASE DESCRIPTION
BRIDGE ERECTION BOAT

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PERFORMANCE-BASED PURCHASE DESCRIPTION
BRIDGE ERECTION BOAT

1. SCOPE

1.1. Abstract. This purchase description establishes the configuration, performance, interface and test requirements for the Bridge Erection Boat (BEB). Government furnished U.S. Combat Support Boats (USCSB) Mk II (Mk II BEB) shall be remanufactured to the standards described in this purchase description.

1.2. General Concept. The BEB will consist of an Mk II BEB with these alterations:

- The existing propulsion jet is replaced by a modern propulsion jet.
- The existing engine and controls are replaced by items based upon the Cummins 210 kit, p/n CPS-210-BEB.
- A new transmission and shaft that match the engine to jet are used.
- Other components, systems and assemblies are retained in the BEB configuration. These items are reused or replaced with the exact item when continued supply of the item is assured.
- When Mk II components, systems and assemblies are no longer supportable or available, they are replaced by functionally equivalent new items.
- Structures and coatings are restored to the minimal extent that will ensure safe operation.

2. APPLICABLE DOCUMENTS

2.1 General. Document users are cautioned that they must comply with the specified requirements and documents cited in the body of this specification, whether or not they are listed in this section. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, in effect on the date of contract award.

2.2. Government Documents

2.2.1. Specifications

MILITARY

MIL-C-53072	- Chemical Agent Resistant Coating (CARC) System Application Procedures and Quality Control Inspection
MIL-C-53039C	- Coating, Aliphatic Polyurethane, Single Component, Chemical Agent Resistant
MIL-DTL-64159	Detail Specification, Coating, Water Dispersible, Aliphatic

	Polyurethane, Chemical Agent Resistant
MIL-STD-1472F	Department of Defense Design Criteria Standard, Human Engineering

The above documents are available on request from the contracting office.

2.2.2. Standards

FEDERAL

FED-STD-595	–	Colors Used in Government Procurement

MILITARY

MIL-STD-1366	–	Transportability Criteria
MIL-STD-130L	-	Identification of U.S. Equipment

The above standards are available from the Standardization Documents Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094 and http://assist1.daps.dla.mil/quicksearch/.

2.2.3. Other Government Documents, Drawings, and Publications.

Drawing	97403 13226E0449	MK2 CSB Hull Structure
Drawing	97403 13226E0450	MK2 CSB Assembly
Drawing	97403 13226E0582	Cab Assembly

Instruction M16672.2D Commandant Instruction, Navigation Rules, International - Inland

The above documents are available on request from the contracting office.

2.3. Non-Government Publications.

AMERICAN WELDING SOCIETY, INC. (AWS)

AWS D1.2/D1.2M:2003 - Structural Welding Code – Aluminum

Copies can be obtained from the American Welding Society, Inc., 550 Lejeune Road, Miami, FL 33126.

AMERICAN SOCIETY FOR TESTING MATERIALS

ASTM D3359-02 - Standard Test Methods for Measuring Adhesion by Tape Test

Copies can be obtained from ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959

SOCIETY OF AUTOMOTIVE ENGINEERS (SAE)

SAE J98 Personnel Protection for General Purpose Industrial Machines (1 November 1992)

Copies can be obtained from the Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, PA 15096.

2.4. Order of Precedence. The order of precedence for requirements in this purchase description shall be:

1. U.S. Laws and Regulations
2. This document
3. Specifications, standards and guides referenced by this document

3. REQUIREMENTS.

3.1. Description. The BEB is an aluminum-hulled, twin-diesel, twin-jet workboat that supports Multi-Role Bridge Company (MRBC) operations. Two BEBs can safely propel and maneuver a seven-bay raft carrying a Military Load Class 80 Tracked (MLC80(T)) or MLC 96 Wheeled (MLC96(W)) load. At a quantity of one boat per three bays, the BEB provides the thrust to temporarily anchor a bridge against river currents. The BEB retains the interface capabilities of the Mk II and is transportable by the same equipment and methods as the Mk II BEB. The BEB is assigned to and is operated and maintained by the personnel of the MRBC.
The BEB meets the requirements herein with all kits applied.

3.2. Physical Characteristics.

3.2.1. Hull. The BEB shall utilize the hull from a Mk II BEB. The general configuration and structure of the Mk II BEB, as depicted by drawing 97403-13226E0449, shall be retained.

3.2.1.1. Structural Alterations. The watertight integrity of the Mk II hull shall be restored during the BEB manufacturing process. Unused penetrations in the watertight and weathertight envelope shall be permanently sealed by welding. Changes to the hull structure and attachments shall be limited to those necessary to accept the specified propulsion system and kits. Structural damage (bends, dents, scrapes, cracks, buckles and penetrations) shall be repaired only to the degree necessary to allow the installation of new components and to ensure safety. Alterations shall be designed to the same standards as the original Mk II hull. Welding shall conform to the requirements of AWS D1.2/D1.2M:2003.

3.2.1.2. Interface Dimensions. The interfaces of the Mk II BEB with the Common Bridge Transport (CBT), Improved Float Bridge (IFB aka Standard Ribbon Bridge or SRB), Improved Ribbon Bridge (IRB), Improved Boat Cradle (IBC) and M1076 Trailer (PLST) shall not be altered.

3.2.1.3. Buoyancy and Stability. Intact stability of the Mk II BEB shall be retained as practicable in the BEB. Cruffles (flotation balls) shall be reused and their stowage compartments sealed. The rigid foam blocks of the Mk II BEB shall be retained as practicable. Scupper check valves (squash balls) shall be replaced. If practicable the BEB, at minimum operating condition, shall remain afloat if holed and free-flooded in calm water.

3.2.1.4. Compartmentation. The BEB shall retain the compartments, enclosures and framing of the Mk II except as necessary to accommodate the specified propulsion system and kits.

3.2.1.5. Grounding Protection. The area of the hull bow that contacts the ground during loading, unloading, launching, operations and recovery shall be fitted with a replaceable wear surface.

3.2.1.6. Keel Cooler Protection. Covers or gratings to protect that keel coolers against grounding and rocks shall be provided. The protective covers or gratings shall be removable with common hand tools. The covers shall not extend below the hull more than 3 inches, shall not affect the interface between the boat and the cradle, and shall allow adequate cooling water flow.

3.2.1.7. Engine Hatch Modification. A means shall be provided or identified to allow personnel to safely cross the engine compartment when the hatches are open. The reinforcing channel on the starboard engine hatch may be modified to serve this function. The provisions or procedures shall be operable without tools.

3.2.1.8. Anodes. The necessity for additional sacrificial anodes shall be investigated. Anodes shall be added or altered as required by the change in propulsion machinery.

3.2.1.9. Operator's Station. The BEB shall retain the general controls and operator's configuration of the Mk II BEB. New controls and displays shall be located as nearly as practicable in the locations of items they replace or supplant.

3.2.1.10. Cab Assembly. The cab assembly shall be restored to conform to drawing 97403 13226E0582 except as specified herein.

3.2.1.11. Storage Provisions. The Mk II BEB provisions for storing Basic Issue Items (BII) shall be retained and modified as necessary to fit the BII currently specified.

3.2.1.12. Weapons Storage. Mounts shall be provided to secure two (2) rifles. The mounts shall accept both M16A2 and M4A2 type weapons. The mount(s) shall hold the weapons securely and shall include a secondary, independent restraint. The mount(s) shall positively secure the weapons against loss should the boat capsize. The mount(s) shall be located near the operator's station.

3.2.1.13. Mast. The Mk II BEB mast and its folding and stowage characteristics shall be retained on the BEB. The mast shall be altered only if necessary and a waiver can not be obtained regarding light placement.

3.2.2. Machinery Systems. The BEB machinery, electrical, auxiliary, gauge and alarm systems shall conform to the general configuration of drawing 97403-13226E0450. The port and starboard systems shall operate independently of each other.

3.2.2.1. Propulsion System. The propulsion system shall be based upon the Cummins 210 hp engine kit (p/n CPS-210-BEB, NSN 2815-01-503-9444), contractor-selected transmissions and shafts, and two new propulsion jets.

3.2.2.1.1. Transmissions and Shafting. The transmissions and shafting shall be matched for the power, rpm and torque of the specified engines and jets. The gear ratio provided shall optimize the low speed, high thrust area of the jet operating envelope.

3.2.2.1.2. Water Jets. Two water jets with matched steering and scoop controls shall be provided. Steering shall be hydraulic, controlling both jets together. Scoop controls shall be power assisted, allowing the operator to change from ahead to astern operation without changing engine RPM. Inlet grill spacing (the maximum size of an object that can enter the jet) shall be minimized (1/2-inch is desired) consistent with the manufacturer's recommendations.

3.2.2.1.3. Oil Sampling Provisions. A means shall be provided to sample the engine lubricating oil, transmission lubricating oil, steering hydraulic fluid and scoop control hydraulic fluid. The provisions shall be located to provide a sample representative of the operating fluid. The provisions shall be located so that samples can be taken when the system is operating. Access points or valves shall be labeled to indicate their purpose and to indicate "open" and "closed".

3.2.2.1.4. Fuel System. The Mk II fuel tank, its mounting, access and level indicating systems shall be retained to the greatest extent practicable. The tank shall be clean inside and free of explosion retardant material.

3.2.2.1.5. Cooling System. The Mk II keel cooling system shall be retained to the maximum extent practicable with the specified engine kit. Independent cooling shall be retained. The cooling system shall allow both engines to be operated with the BEB clear of the water, at idle speed, in neutral gear, for 10 minutes. Keel cooler capacity shall be analyzed. The coolers shall be replaced, if necessary, with a more efficient design utilizing the same interface dimensions.

3.2.2.1.6. Keel Cooler Recirculation. Piping shall be provided to draw water from the propulsion jet casings and direct it into the keel cooler recesses. Valves shall be provided if required for safety. The system shall be sized to allow the coolers to work properly when the boat is stationary and when the cooler protection kit is installed.

3.2.2.1.7. Air Intake system. The Mk II air intake system shall be modified as necessary to accommodate the specified engine kit. External filters and/or screens shall be fitted per the engine manufacturer's recommendations.

3.2.2.1.8. Engine Exhaust system. The Mk II exhaust system shall be retained to the greatest degree compatible with the specified engines.

3.2.2.1.9. Automatic Fire Extinguisher. An automatic fire extinguishing system shall protect the engine compartment. The system shall use FM-200 agent. A manual, back-up activation mode is desired.

3.2.2.1.10. Hand-Operated Bilge Pump. A portable, hand-operated bilge pump shall be provided. The pump shall be capable of removing water from the lowest point in the bilges at a rate of at least 6 gallons per minute.

3.2.3. Electrical System.

3.2.3.1. General Requirements. The Mk II BEB electrical system shall be retained to the greatest degree compatible with the specified propulsion system and as described herein.

3.2.3.2. Wiring and Wiring Harnesses. New wires added to meet the BEB requirements shall be added as separate items, completely independent of existing Mk II BEB harnesses. The wiring harnesses provided with the BEB shall have the following characteristics:

- The bulk wire shall conform to current standards.
- End connectors shall be replaced with current technology devices.
- Intermediate connectors may be added to simplify troubleshooting and replacement.
- Wires within harnesses and individual wires shall be labeled and color-coded.

3.2.3.3. Alternators. Alternators of sufficient capacity to meet the requirements of this specification shall be provided. This may require that the alternators in the specified engine kit be replaced.

3.2.3.4. NATO Slave Receptacle. The NATO slave receptacle shall be retained. It may be replaced with a current technology component.

3.2.3.5. Switch and Circuit Breaker Panels. The Mk II BEB primary and auxiliary switch and circuit breaker panels shall be retained. The following modifications are authorized:

- Interior components may be upgraded to current technology.
- Bulk wire shall conform to current standards.
- End connectors may be replaced with current technology devices.
- Circuit breaker ratings shall match the new technology devices incorporated in other portions of the electrical system.

3.2.3.6. Searchlight. A fixed or portable searchlight shall be provided. It shall provide at least 1 lux of light at 1000 feet. The searchlight shall be capable of elevating and depressing at least 16 degrees from horizontal. It shall have a rotation of 360 degrees. These requirements may be met with a hand-held unit or fixed unit. The Mk II BEB searchlight may be retained if it complies.

3.2.3.7. Electrical Horn. The Mk II BEB horn shall be retained. If it is no longer available it shall be replaced with a new technology electrical horn of the same rating.

3.2.3.8. Navigation Lights. The boat shall be equipped with Navigation, Towing and Anchor lights complying with Commandant Instruction M16672.2D, as modified by contractor obtained waiver, for the intended purposes of the BEB. The light style and method of mounting shall provide protection against damage during truck transport of the boat.

3.2.3.9. Inspection Light. An inspection light shall be provided. The Mk II BEB inspection light may be retained. The Mk II receptacle shall be upgraded to match the new light, if required.

3.2.3.10. Electrical Bilge Pumps. The electrical bilge pumps shall be replaced with modern devices each having a capacity of at least 2000 gallons per hour as installed. The pumps shall operate independently. They shall be activated automatically as well as manually from the operator's station. Screens to block debris shall be fitted to the pumps and their float switches if similar provisions are not incorporated in the equipment.

3.2.3.11. Alarms. The Mk II audible and visual alarms shall be retained and upgraded with new technology devices. Alarms provided with the specified engine kit shall fulfill this requirement as practicable. A visual and audible alarm shall be provided with the fixed fire extinguisher system. This alarm may indicate either presence of fire or fire extinguisher system discharged.

3.2.3.12. Cab Electrical System. The Mk II BEB window wipers and motors shall be replaced with modern devices of the same general configuration. The wiring harness shall be upgraded per section 3.2.3.2. The searchlight mount and electrical connector shall be upgraded to match the chosen searchlight per section 3.2.3.6.

3.2.4. Instruments and Controls

3.2.4.1. Operator's Controls. The operator's control console and operator's controls of the Mk II BEB shall be retained as practicable. Items not included in the specified engine and jet kits shall conform to Mk II BEB characteristics.

3.2.4.2. Blackout Requirement. New items added to the BEB shall be blackout equipped or shall be fitted with switches to either secure them or change them to blackout mode. The emissions in the blackout mode shall be limited to the visible spectrum (380 to 700 nanometers). No energy shall be emitted in the 700 to 1200 nanometer portion of the electromagnetic (EM) spectrum. Emission peaks shall not exceed 1% relative to the peak emission in the visible spectrum.

3.2.4.3. Instruments. The Mk II BEB gauges and indicators shall be replaced with modern technology items. Gauges and indicators provided with the specified engine shall fulfill this requirement as practicable.

3.2.5. Basic Issue Items (BII). The following BII shall be supplied with the BEB.

3.2.5.1. Personal Flotation Device. Three USCG approved Type I personal flotation devices (PFD) shall be provided. The PFDs shall be Army green or camouflage in color. These items are acceptable: (Small-Medium) NSN 4220-01-454-6135, (Large-Extra Large) NSN 4220-01-454-6136. Two of the PFDs shall be large size, one shall be medium size.

3.2.5.2. Ring Buoy. A USCG approved Type IV flotation device (ring buoy) shall be provided. The ring buoy shall have attached a minimum of 50 ± 3 ft. of ½-inch diameter, polypropylene line. Storage space and/or mounting provisions shall be provided.

3.2.5.3. Portable Fire Extinguisher. The BEB shall comply with the USCG requirement for portable fire extinguisher(s) with mounting bracket(s). At a minimum, a class 5BC extinguisher shall be mounted near the operator's station using USCG approved brackets.

3.2.5.4. Boat Hook. The BEB shall be provided with a boat hook with a length of approximately 7 ft. The boat hook shall have ball type or pointless tips. Storage space or mounting provisions shall be provided. Boat hook NSN 2040-00-007-1136 is acceptable.

3.2.5.5. Anchor and Line. The Mk II BEB anchor and line configuration shall be retained. Modern components shall be incorporated as necessary.

3.2.5.6. Lines. The Mk II BEB line configurations shall be retained. The basic line material shall be modernized to ¾-inch diameter, double-braided nylon. Line conforming to MIL-R-24050 is acceptable.

3.2.5.7. Hand Tools. The BEB shall have a ¼-inch wide flat tip screwdriver, (NSN 5120-00-222-8852 is acceptable), a #2 cross tip (Phillips) screwdriver (NSN 5120-00-234-8912 is acceptable) and an 8-inch adjustable wrench (NSN 5120-00-240-5328 is acceptable). Hand tools required to perform operator checks and adjustments shall also be provided.

3.2.5.8. First Aid Kit. A two-person first aid kit, similar to NSN 6545-00-922-1200, shall be provided. The supplied first aid kit shall be located in the operator station in a quickly accessible location.

3.2.5.9. Hatchet. The BEB shall be provided with a hatchet, similar to NSN 5110-00-555-8868.

3.2.5.10. Document Pouch. The boat shall have a water-resistant document pouch, large enough to hold a standard 8 ½ x 11 x 1-inch three-ring binder. Pouch, NSN 7520-00-599-9618, is acceptable.

3.2.5.11. Operator's Manual. Space shall be provided for a Government furnished Operator's Manual.

3.2.5.12. Keys, Pins and Handles. Keys and handles required to operate installed equipment and hatches shall be provided. Pins used as hold-opens and keys shall be tethered to prevent their loss.

3.2.6. Kits. Every boat shall have space allocated and reserved to accept the kits specified herein. Every boat shall possess the physical and electrical interfaces necessary to accept the kits. Kits shall be developed, documented, installed in boats, or provided separately as required by the Statement of Work. Kits are exempt from blackout requirements. There shall be either a circuit breaker or a switch to isolate each kit during blackout operation.

3.2.6.1. Navigation Equipment Kit (NAVKIT). The NAVKIT shall consist of a contractor selected Global Positioning System (GPS), depth sounder, antenna(s) and fathometer transducer and all integrating components. Instruments that combine these functions are acceptable. Every boat shall contain a fathometer well and dummy fathometer head as necessary. The boats and kits shall have weather proof caps or covers to protect the terminals, mounts and exposed interfaces when components are not installed. The GPS antenna shall be located on the mast. The kit shall require only common hand tools for installation.

3.2.6.2. Radio Installation Kit. The Radio Installation Kit shall consist of the brackets, wires, mounts, interface components and hardware necessary to install an AN/VRC-87E SINCGARS radio system, with LS-454 or LS-671 remote speaker and 9-foot, AS-3900 type antenna. The kit shall include components except the AN/VRC-87E. The kit shall also include weather proof caps or covers to protect the terminals, mounts and exposed interfaces when the AN/VRC-87E is not installed. The radio antenna shall be located on the mast. The kit shall require only common hand tools for installation.

3.2.6.3. Heater Kit. The heater kit shall consist of a contractor selected fixed or portable heater, and the brackets, wires, mounts, interface components and hardware necessary to install it. The heater may be either fixed or portable. It shall provide heat in the cabin area. If separately fueled it shall draw fuel from the boat's fuel tank. The heater need be operable only when the engines are operating. The kit shall require only common hand tools for installation.

3.3. Not Used

3.4. Safety and Human Factors Engineering.

3.4.1. Safety. New items added to the BEB other than the specified propulsion system components shall conform to the requirements and recommended practices of SAE J98. New items shall be designed so crewmembers are not exposed to hot surfaces or dangerous corners or edges. Crew stations, platforms, deck plating and steps shall have anti-skid surfaces.

3.4.2. Noise Limits. The steady-state noise produced by the engines shall not exceed 85 dB measured at the operator's station.

3.4.3. Human Factors Engineering (HFE). New items added to the BEB shall conform to Human Factors Engineering criteria as described in MIL-STD-1472F for the 5th percentile female to the 95th percentile male dressed in Mission Oriented Protective Posture (MOPP) IV and Arctic Gear. New controls shall be sized to allow operation when wearing MOPP IV garments.

3.5. Environmental and Survivability.

3.5.1. Operating Temperatures. The BEB shall perform as specified herein in any ambient temperature from -25°F to +120°F. Waterborne operations at low temperature are performed in the absence of ice.

3.5.2. Storage Temperatures. The BEB shall withstand indefinite storage in any ambient temperature from -50° F to +160° F. Systems containing fluids shall be protected, by hardware or procedures, against freezing.

3.6. Materials.

3.6.1. General. Materials and components added to the BEB shall be suitable for marine (saltwater) service. The BEB hull shall have a 20-year life, from date of remanufacture, when maintained in accordance with the manufacturer's instructions.

3.6.2. Prohibited Materials. Materials and components added to the BEB shall not contain asbestos, cadmium plating, toxins, hazardous materials, radiological materials or ozone depleting chemicals.

3.6.3. Corrosion Protection. Structural materials and components added to the BEB shall provide a 20 year life when maintained in accordance with recommended procedures. Machinery and electrical components shall be integrated such that their corrosion resistant properties are not degraded by the installation. Dissimilar metals shall not be used in intimate contact with each other unless protected against galvanic corrosion. Items shall be grounded and bonded per the equipment manufacturer's recommendations. Through-hull penetrations shall be designed to minimize galvanic corrosion. The components of the specified engine kit shall be altered, through specification of new materials, if necessary, to comply with this paragraph.

3.6.4. Recycled and Recovered Materials. The components, pieces and parts incorporated in the BEB may be fabricated from virgin materials or they may be newly fabricated from recycled/recovered materials.

3.6.5. Used, Rebuilt and Remanufactured Components. The BEB shall be manufactured using Mk II BEB hulls. Other used, rebuilt or remanufactured components, pieces and parts may be incorporated in the BEB only with specific Government approval. The reuse of Mk II BEB fittings, equipment and appurtenances is encouraged.

3.6.6. Fluids, Lubricants and Fuels. Machinery shall function properly using U.S. Army stock fluids. Initial fills shall be compatible and interchangeable with the U.S. Army fluids. All testing shall be conducted with JP8 fuel.

3.7. Transportability.

3.7.1. Highway Transportability. The BEB, with all kits, in the IBC, loaded onto the CBT, shall be highway transportable with permits allowed for width and axle load. The maximum height of the BEB on a CBT truck, in transport configuration, shall not exceed 4 meters. The BEB shall be capable of being transported on flatbed trailers with and without the IBC. The use of improvised chocks and bracing is allowed when the IBC is not used.

3.7.2. Rail Transportability. The BEB, with the IBC, in transport configuration, shall be rail transportable in CONUS and NATO counties without restrictions. The BEB, prepared for rail shipment, shall comply with the Gabarit International de Chargement (GIC) diagram (see MIL-STD-1366, Transportability Criteria) when loaded on a 50 inch high rail car. The BEB with all kits, in rail transport configuration, shall be capable of withstanding the shock loads resulting from rail impact test without failure, damage or permanent deformation.

3.7.3. Marine Transportability. The BEB, with all kits, both with and without its cradle, shall be marine transportable on LCM-8 and larger vessels and ships.

3.7.4. Aircraft. The BEB, with all kits, both with and without its cradle, shall be transportable by C130 and larger aircraft. The BEB, with and without its cradle, shall be transportable as an external load by CH47D helicopter.

3.7.5. Cab Stowage. The cab shall be removed and stored on/in the BEB to conform to transport requirements. Brackets or attachments may be added to prevent damage during transportation.

3.7.6. Mast Stowage. Brackets or stowage provisions shall be provided for the mast.

3.7.7. Slinging and Tie Down Provisions. The BEB shall utilize the lifting and tie down provisions of the Mk II BEB. Alterations and additions to the BEB shall not interfere with the use of these fittings. Access to the fittings is required for crane lifting with a 4-leg sling, lifting under a CH47D helicopter and tie down to trailers and rail cars. The provisions shall be labeled "LIFT", or "LIFT/TIEDOWN", as applicable, in letters one (1) inch high.

3.8. Painting and Marking

3.8.1. Finishes. Repaired and disturbed undercoat areas of the BEB shall be painted with a coating system suitable for saltwater marine service. The entire topcoat shall be restored using a chemical agent resistant coating (CARC) paint conforming to MIL-C-53039B or MIL-DTL-64159. Topcoat CARC coatings shall be applied in accordance with MIL-C-53072. The topcoat shall be single color 34094, green 383, matte finish, conforming to FED-STD-595.

3.8.2. Marking. Markings which are not provided as data plates shall be in numerals or letters one inch in height. Painted markings shall be lusterless black. Draft markings shall be placed forward and aft to indicate the Minimum and Full Load waterlines.

3.8.2.1. Safety Markings. The safe working load of the capstan and tow hook shall be displayed. Safety notices, warnings and cautions recommended by equipment manufacturers shall be displayed.

3.8.3. System Markings.

3.8.3.1. Controls. Gauges, switches, circuit breakers, lights and alarms shall be identified for function and status (on/off) when such marking is not provided as part of the item.

3.8.3.2. Valves. All valves in the bilge, cooling, fuel and lubricating systems shall be labeled. Labels shall identify the valve and indicate its normal position (open/close).

3.8.3.3. Cable Marking and Identification. All permanently installed cables shall be tagged, or otherwise permanently marked as an aid to tracing and circuit identification. Wiring which is disconnected in use, e.g. mast lighting, shall be marked for ease of reassembly.

3.8.4. Instruction, Identification and Data Plates. Instruction, data and identification plates shall be provided as necessary for the safe operation of the BEB. These plates shall be metallic, with the information stamped, embossed, etched, or engraved of commercial grade suitable for saltwater marine service. Plates located within the protected cab area may be of laminated, engraved plastic construction. Plate face surfaces shall be fade and corrosion resistant. Plates shall be permanently mounted using screws or rivets. The manufacturer's commercial plates may be used with the written approval of the Contracting Officer.

3.8.4.1. Pollution Placard. A "Federal Water Pollution Control Act" placard or decal shall be provided near the operator's station.

3.8.4.2. Boat Plate. The Mk II BEB identification plate shall be modified, or a new plate shall be provided, which includes the following information:

- Boat Nomenclature (will be provided by Government)
- U.S. Army Serial Number
- Re-manufacturer's name and Contract Number
- National Stock Number (NSN)
- Date Re-manufactured (month and year)

3.8.4.3. Shipping Data Plate. The BEB shall be provided with a plate giving transportation data. It shall show the silhouette of the boat without cradle, indicating locations and capacity of lifting and tie down attachments, overall dimensions, weight, location of the center of gravity, length and size of slings required. This plate shall be located adjacent to the boat plate.

3.8.5. Unique Identification Code (UID). A UID code 'tag' shall be applied to the boat, each engine and each jet. The UID 'tag' shall be configured, coded and applied in accordance with MIL-STD-130L.

3.9. System Integration. The inherent functionality, performance, reliability and maintainability of the BEB and new components shall not be adversely affected by the selection or integration of the new components. Fluid-carrying systems shall not leak. Mechanical systems shall not bind. Components shall be chosen, as practical, so that a single system of pipe thread is used throughout the boat and so that mixed systems do not appear on a single item.

4. PRODUCT ASSURANCE

4.1. Definitions

4.1.1. Test. A test is the systematic operation of an item under appropriate conditions, with or without instrumentation. A test includes the collection, analysis, and evaluation of quantitative data against an established standard.

4.1.2. Analysis. An analysis is the evaluation of technical or mathematical data, algorithms, charts, diagrams and historical data for compliance with an established standard.

4.1.3. Inspection. An inspection is the visual examination of an item and comparison to an established standard. Inspections are applicable to end items, components, documentation and certificates.

4.1.4. Demonstration. A demonstration is the functional check for proper operation of the end item or its components.

4.1.5. Verification. Verification is the visual examination for the presence of a feature, item or function.

4.1.6. Certificate of Conformance (CofC). A CofC is a document certifying conformance to a specific requirement or standard. Certificates are signed by a responsible party.

4.1.7. Final Inspection Record (FIR). The FIR is a permanent record which documents all evaluations performed on a production item. The FIR records both in-process and final inspection results and any corrective actions taken, for each boat produced. The FIR is a contractor produced, government approved document.

4.2. Classes of Assessment

4.2.1. In-Process Inspection. In-Process Inspections are performed on every boat as the boat is being manufactured. In-Process Inspections are carried out in accordance with a contractor developed production and quality plan. In-Process Inspections are performed on work in progress

to verify quality, conformance, procedures and records. The Government witnesses and participates in In-Process Inspections at the Government's option.

4.2.2. Quality Conformance Inspection (QCI). The QCI is a final inspection of each end item performed by the contractor. The QCI is performed before the item is presented to the Government for acceptance. This inspection includes those requirements from Section 3 that are identified in Table I. The QCI utilizes a Final Inspection Record (FIR). Successful completion of QCI is a prerequisite to signing of the DD250.

4.2.3. First Production Unit Inspection (FPUI). The FPUI is an inspection of the first unit produced. The FPUI is conducted at the place of manufacture. The FPUI combines the In-Process Inspections with a final inspection verifying that the boat complies with the requirements of Section 3 and is ready to start Shakedown Test. The Government will witness and participate in the FPUI. The FPUI shall include an examination of certificates, work instructions, process procedures, and other documents supporting the manufacturer's quality and production systems.

4.2.4. Shakedown Test (ST). The ST is a test of the end item conducted by the contractor at his site, with Government oversight. The ST evaluates the complete boat for conformance to technical requirements and confirms that the design is ready for production. The ST is conducted in accordance with an approved test plan. Table I identifies the systems and functions that will be evaluated. The ST may be repeated or continued to verify that corrective actions resulting from the initial ST are effective.

4.2.5. Control Test (CT). The CT is a test performed if there is reason to believe that production boats do not meet the technical requirements. The Government will select CT boats as needed.

4.2.6. Builder's Trial (BT). The Builder's Trial is a functional test performed on every production boat prior to delivery. The BT verifies that the component parts and their integration perform to a minimum standard without failure. During BT all systems of the boat are exercised. The BT is conducted in accordance with the contractor developed, Government approved BT plan. Successful completion of BT is a prerequisite to signing of the DD250.

4.2.7. Adhesion Test. Paint film quality is verified by adhesion and corrosion resistance testing in accordance with ASTM D3359.

4.3. Evaluation Matrix. When required by contract and ordering documents, tests and evaluations shall be performed on various systems, to assess compliance with the various specifications, in accordance with Table I.

TABLE I
EVALUATION MATRIX

Type:
Quality Conformance Inspection (QCI)
First Production Unit Inspection (FPUI)
Shakedown Test (ST)
Control Test (CT)
Builder's Trial (BT)

QCI	FPUI	ST	CT	BT	EVALUATION	SECTION 3 REF.	METHOD (see notes)
					Description	3.1	7
					Physical characteristics	3.2	7
X	X			X	Hull	3.2.1	5
X	X			X	Structural Alterations	3.2.1.1	5,6
X	X				Interface Dimensions	3.2.1.2	2,3
X	X			X	Buoyancy and Stability	3.2.1.3	2,3,5
X	X				Compartmentation	3.2.1.4	3
X	X				Grounding Protection	3.2.1.5	3
X	X	X	X		Keel Cooler Protection	3.2.1.6	2,3,4
X	X	X	X	X	Engine Hatch Modification	3.2.1.7	3,4
X	X				Anodes	3.2.1.8	2,3
X	X				Operator's Station	3.2.1.9	3
X	X				Cab Assembly	3.2.1.10	3
X	X	X	X	X	Storage Provisions	3.2.1.11	3,4
X	X	X	X	X	Weapons Storage	3.2.1.12	3,4
X	X				Mast	3.2.1.13	3,6
X	X				Machinery Systems	3.2.2	3
X	X				Propulsion System	3.2.2.1	3
X	X				Transmission and Shafting	3.2.2.1.1	2,3,6
X	X				Water Jets	3.2.2.1.2	3
X	X	X	X	X	Oil Sampling Provisions	3.2.2.1.3	3,4
X	X	X	X	X	Fuel System	3.2.2.1.4	3,4
X	X	X	X	X	Cooling System	3.2.2.1.5	1,2,3,4
X	X	X	X	X	Keel Cooler Recirculation	3.3.2.1.6	1,2,3,4
X	X				Air Intake System	3.2.2.1.7	2,3
					Engine Exhaust System	3.2.2.1.8	7
X	X				Automatic Fire Extinguisher	3.2.2.1.9	2,3,6
X	X	X	X	X	Hand Operated Bilge Pump	3.2.2.1.10	2,3,4
					Electrical System	3.2.3	7
X	X	X	X	X	General Requirements	3.2.3.1	3,4
X	X	X	X	X	Wiring and Wiring Harnesses	3.2.3.2	2,3,4
X	X	X	X	X	Alternators	3.2.3.3	2,3,4
X	X	X	X	X	NATO Slave Receptacle	3.2.3.4	3,4
X	X	X	X	X	Switch and Circuit Breaker Panels	3.2.3.5	2,3,4
X	X	X	X	X	Searchlight	3.2.3.6	2,3,4
X	X				Electrical Horn	3.2.3.7	2,3
X	X				Navigation Lights	3.2.3.8	2,3,6

QCI	FPUI	ST	CT	BT	EVALUATION	SECTION 3 REF.	METHOD (see notes)
X	X	X	X	X	Inspection Light	3.2.3.9	4,5
X	X	X	X	X	Electrical Bilge Pumps	3.2.3.10	2,3,4
X	X	X	X	X	Alarms	3.2.3.11	2,3,4
X	X	X	X	X	Cab Electrical Systems	3.2.3.12	2,3,4
					Instruments and Controls	3.2.4	7
X	X			X	Operator's Controls	3.2.4.1	5
X	X	X	X	X	Blackout Requirement	3.2.4.2	3,4,6
X	X	X	X	X	Instruments	3.2.4.3	3,4
					Basic Issue Items	3.2.5	7
X	X				Personal flotation device	3.2.5.1	5
X	X				Ring Buoy	3.2.5.2	5
X	X				Portable Extinguisher	3.2.5.3	5
X	X				Boat Hook	3.2.5.4	5
X	X				Anchor and Line	3.2.5.5	5
X	X				Lines	3.2.5.6	5
X	X				Hand Tools	3.2.5.7	5
X	X				First Aid kit	3.2.5.8	5
X	X				Hatchet	3.2.5.9	5
X	X				Document Pouch	3.2.5.10	5
X	X				Operator's Manual	3.2.5.11	5
X	X				Keys, Pins and Handles	3.2.5.12	5
X	X	X	X	X	Kits	3.2.6	5,4
X	X	X	X		Navigation Equipment Kit (NAVKIT)	3.2.6.1	3, 5 always 1,3,4 when installed
X	X	X	X		Radio Installation Kit	3.2.6.2	3, 5 always 1,3,4 when installed
X	X	X	X		Heater Kit	3.2.6.3	3,5 always 1,3,4 when installed
					Reserved	3.3	7
					Safety and Human Factors	3.4	7
	X				Safety	3.4.1	2
	X	X	X		Noise Limits	3.4.2	1,2
X	X				Human Factors Engineering	3.4.3	2,3
					Environmental Survivability	3.5	7
	X	X	X		Operating Temperatures	3.5.1	1,2
	X	X	X		Storage Temperatures	3.5.2	1,2
					Materials	3.6	7
	X				General	3.6.1	2
X	X				Prohibited Materials	3.6.2	3
X	X				Corrosion Protection	3.6.3	2, 3, 6
					Recycled and Recovered Materials	3.6.4	7
	X				Used, Rebuilt and Remanufactured Components	3.6.5	2
	X	X	X	X	Fluids, Lubricants and Fuels	3.6.6	2,4,6
					Transportability	3.7	7
	X	X	X		Highway Transportability	3.7.1	1,2
	X	X	X		Rail Transportability	3.7.2	1,2

QCI	FPUI	ST	CT	BT	EVALUATION	SECTION 3 REF.	METHOD (see notes)
	X				Marine Transportability	3.7.3	2
	X				Aircraft	3.7.4	2
	X	X	X		Cab Stowage	3.7.5	1,2
	X	X	X		Mast Stowage	3.7.6	1,2
X	X				Slinging and Tie Down Provisions	3.7.7	2,3
					Painting and Marking	3.8	7
X	X	X	X	X	Finishes	3.8.1	3,4,6,8
X	X				Markings	3.8.2	3
X	X				Safety Markings	3.8.2.1	3
X	X				System Markings	3.8.3	3
X	X				Controls	3.8.3.1	3
X	X				Valves	3.8.3.2	3
X	X				Cable Marking and Identification	3.8.3.3	3
X	X				Instruction, Identification and Data Plates	3.8.4	3
X	X				Pollution Placard	3.8.4.1	3
X	X				Boat Plate	3.8.4.2	3
X	X				Shipping Data Plate	3.8.4.3	3
X	X				Universal Identification Code	3.8.5	3
X	X	X	X	X	System Integration	3.9	2,3,4

Notes: Evaluation method key:

1. Test
2. Analysis
3. Inspection
4. Demonstration
5. Verification
6. Certification
7. No Evaluation Required
8. Paint Adhesion Test

5. ACQUSITION REQUIREMENTS.

When this PD is used for acquisition, the procurement documents shall specify the following:

- Title, number, and date of this specification.
- Issue of DoDISS to be cited in the solicitation and, if required, the specific issue of individual documents referenced.
- Identification of required tests.
- Quantity of BEBs to test.
- Packaging requirements.
- Requirements for kits.
- Paint top coat color.