

Specification No. 2B047-S3116-50-040  
Code Identification 80091  
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1 of 20

RECOATING REQUIREMENTS FOR  
SEALIFT SUPPORT FACILITIES EQUIPMENT  
CONFIGURATION ITEM NUMBER - NONE

1. SCOPE

1.1 Scope. This specification sets forth the recoating requirements for Sealift Support Facilities (SSF) equipment.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and standards. The following specifications and standards 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, on date of use or request for proposal.

SPECIFICATIONS

MILITARY

MIL-PRF-16173 - Corrosion Preventive Compound, Solvent Cutback, Cold-Application.  
MIL-DTL-24441/23- Paint, Epoxy-Polyamide, Dark Gray R01.8, Formula 153, Type III.  
MIL-DTL-24441/29- Paint, Epoxy-Polyamide, Green Primer, Formula 150, Type IV.  
MIL-DTL-24441/37- Paint, Epoxy-Polyamide, Yellow, Formula 158, Type IV.  
MIL-I-45208 - Inspection System Requirements.  
(Cancelled)

STANDARD

FEDERAL

FED-STD-595 - Colors Used in Government Procurement.

(Unless otherwise indicated, copies of federal and military specifications and standards are available from the Standardization Documents Order Desk, Bldg. 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.2 Non-government documents. The following documents form a part of this specification to the extent specified herein. Unless otherwise indicated, the issue in effect on date of use or request for proposal shall apply.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

- ANSI/ASQC Q9000:2000 - Quality management systems -  
Fundamentals and vocabulary
- ANSI/ASQC Q9001:2000 - Quality management systems -  
Requirements
- ANSI/ASQC Q9004:2000 - Quality management systems -  
Guidelines for performance  
improvements

(Application for copies should be addressed to American National Standards Institute, Inc., 25 West 43<sup>rd</sup> Street, 4<sup>th</sup> Floor, New York, NY 10018.)

ASTM

- ASTM D4541 - Standard Test Method for Pull-Off Strength of  
Coatings Using Portable Adhesion Testers.

(Application for copies should be addressed to ASTM, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.)

THE SOCIETY FOR PROTECTIVE COATINGS (SSPC)

- SSPC-PA1 - Shop, Field and Maintenance Painting.
- SSPC-PA2 - Measurement of Dry Paint Thickness with  
Magnetic Gages.
- SSPC-PA3 - Guide to Safety in Paint Application.
- SSPC-SP7 - Brush-Off Blast Cleaning.
- SSPC-SP10 - Near White Blast Cleaning.
- SSPC-SP12 - Surface preparation via water cleaning
- SSPC-VIS-1 - Visual Standard for Abrasive Blast Cleaned  
Steel (Standard Reference Photographs).

(Application for copies should be addressed to The Society for Protective Coatings, 40 24<sup>th</sup> Street, Suite 600, Pittsburgh, PA 15222-4656.)

Technical society and technical association specifications and standards are generally available for reference from libraries. They are also distributed among technical groups and using Federal agencies.

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, this specification shall take precedence. Nothing in this specification, however, supersedes applicable laws and regulations. If application of the coating requirements stated herein results in a conflict with applicable laws or regulations, the Contracting Officer shall be notified as soon as practicable.

### 3. REQUIREMENTS

3.1 General. It is the intent of the Sealift Support Facilities (SSF) program to utilize coating systems that meet the United States (U.S.) Navy requirements for equipment protection as well as minimize volatile organic compound (VOC) emissions during surface preparation and application of these coatings. Unless otherwise specified in the contract, the contractor shall establish an inspection system in accordance with ISO 9000 and ISO 9001. MIL-I-45208 may be used as a guide.

3.2 Coating materials. Unless otherwise specified, the following coating materials and coating procedures shall be used for "recoating" SSF equipment.

3.2.1 Epoxy paint. Epoxy primers and paints specified herein are for marking and identifying special features on components previously coated with high ratio water-based inorganic-zinc paint. In addition, epoxy primers and paints are specified for components where inorganic zinc paint is not appropriate. Epoxy primers and epoxy top-coat paint shall conform to the applicable reference documents cited herein.

3.2.2 High-ratio water-based inorganic-zinc paint. This high-ratio water-based inorganic-zinc paint shall conform to the quantitative paint requirements listed in Table 1. The controlling requirement for the liquid vehicle is a molecular ratio of potassium to silicate of 5.3:1. The high-ratio water-based inorganic-zinc paint is a ready-to-mix, two component material, furnished in separate companion containers (zinc dust in one container and liquid vehicle in the other). Liquid vehicle appearance shall be clear and glasslike. It shall not be cloudy or milky and be free of any solids by visual inspection.

Table 1. Quantitative requirements for high-ratio water-based inorganic-zinc paint.

<b>Characteristic</b>	<b>Requirement</b>
Volume Solids	68% $\pm$ 2% by volume
Zinc Content	90% of total solids by weight
Potassium Silicate Ratio (SiO <sub>2</sub> :K <sub>2</sub> O)	5.3:1
Volatile Organic Component (VOC) Content	0 lb/gal
Flash point	None

3.2.3 Corrosion preventive compound. Corrosion preventive compound shall conform to MIL-PRF-16173.

3.2.4 Deck coating. The deck coating material shall be a spray-on type, manufacturer's standard aggregate/binder non-slip coating designed as a non-slip walking surface and compatible with the high-ratio water-based inorganic-zinc paint specified in 3.2.2. The cured deck coating material color shall be dark gray, No. 36076 conforming to FED-STD-595.

3.3 Material storage. All coating materials shall be stored in the manufacturer's original, unopened containers. Containers shall not be opened except for immediate use. Coating materials shall be protected from damage, moisture, direct sunlight, and temperature extremes as specified by the product manufacturer. Coating materials that exceed the product manufacturer's recommended shelf life shall not be used. Any unused material shall not be combined and returned to storage. Contents of punctured or leaking containers shall not be used.

3.3.1 Material storage log. User shall maintain a material storage log. The log shall, as a minimum, include the following:

- a. Product manufacturer's name.
- b. Product name/designation.
- c. Batch/lot number.
- d. Date of manufacture.

3.4 Surface preparation. All surfaces to be coated or preserved, including the original inorganic-zinc painted surfaces, shall be clean, dry, and completely free of corrosion products, mill scale, overspray, dry spray, dust, dirt, oil, grease, solvent or mineral residue, moisture, and other surface contaminants.

3.4.1 Excluded surfaces. The following surfaces shall not be abrasive blasted or painted: pre-painted purchased components, 300 and 400 series stainless steel components, rubber bumpers, gaskets, electromagnetic materials, coated fastener threaded surfaces (prior to assembly), and non-ferrous bearing materials.

3.4.2 Blast cleaning.

3.4.2.1 General. Blasting media shall be free from oil and organic contaminants. When recycled blasting media is used, it shall be refurbished and maintained so as not to contaminate surfaces with residual materials. Compressed air shall be free of oil and moisture. Drop cloths, shields, masking and other sealing or blanking-off measures shall be used to prevent blasting abrasives from entering machinery, pipes, hydraulic system components, electrical system junction boxes/equipment. Weld spatter, slivers, laminations and excessive weld porosity (pin holes) that become visible after blast cleaning shall be removed or repaired before coating. Anchor profile height shall be between 1 ½ and 2.0 mils. All anchor profile heights shall be measured with a surface profile-measuring device and recorded. All abrasive blast cleaned surfaces shall be inspected in accordance with SSPC-VIS-1.

3.4.2.2 Water Blast Cleaning Requirements. Before any grit blast cleaning, all assembled NL powered (WTs and CSPs) and non-powered causeways, ELCAS (M) modules and other Sealift Support assets scheduled for coating renewal shall be water jet pressure washed to remove marine growth in accordance with SSPC-SP12. The pressure shall be reduced so that the existing inorganic-zinc paint is not removed unless it is loose and damaged.

3.4.2.3 Grit Blast Requirements To preserve any existing well-adhered inorganic-zinc coating and deck coating, all assembled N/L powered (WTs and CSPs) and non powered causeways, ELCAS (M) modules and other Sealift Support assets scheduled for coating renewal shall be brush-off blast cleaned in accordance with SSPC-SP7. The brush-off blast is an abrasive blast that only removes loose and damaged paint and does not go to bare metal. This process is intended to remove any remaining marine growth after water blast cleaning, remove any loosely adhered paint or deck coating and provide a cleaned surface on which to rebuild the inorganic-zinc millage. Any remaining inorganic-zinc coating DFT shall be measured in accordance with SSPC-PA2, recorded and used to determine further processing of each individual asset in overhaul as follows:

a. If the remaining coating measures less than 1 mil DFT, then those surfaces shall be abrasive blasted to "Near-White" metal in accordance with SSPC-SP10 and high ratio inorganic zinc coating shall be applied as specified in 3.5.

b. If the remaining coating measures between 1 mil and 4 mils, then high-ratio inorganic-zinc coating shall be applied as specified in 3.5.

c. If the remaining coating is greater than 4 mils, then the final DFT specification value has been achieved, and no further processing is required on this surface.

**NOTE:** Since the high-ratio water-based inorganic-zinc is consumed over time while the asset is afloat, the overhaul facility should anticipate that intact coating DFT below the waterline will be significantly less than above the waterline. Many cases have been found where assets in service for several years have no degradation of the original coating above the waterline. Therefore, it is entirely possible that certain assets going through overhaul will only require recoating of the surfaces below the waterline.

3.4.2.4 Inaccessible Areas In the inaccessible areas located between the pontoons that make up the NL powered (WTs and CSPs) and non-powered assembled causeways, the overhaul facility is expected to blast-clean as far into these areas as practicable. In practice this distance ranges between 1 and 2 feet.

3.4.2.5 Aluminum surfaces. Aluminum surfaces shall be prepared for coating in accordance with SSPC-SP7.

3.5 Application. The coating material shall be applied as soon as practicable after abrasive blasting in 3.4.2. This time interval between abrasive blasting and coating application will vary with the relative humidity of the painting environment. Therefore, prior to painting, completely blasted surfaces shall be inspected to insure flash rust has not occurred. If flash rust is present, the affected area shall be re-blasted in accordance with 3.4.2. Measurement of the total Dry Film Thickness (DFT) applied shall be in accordance with SSPC-PA2 based on a failure criterion of one square inch of non-conforming surface in any one thousand square inches. When tested in accordance with ASTM D4541, the fully cured inorganic-zinc paint shall achieve a minimum pull-test strength of 600 psi. A minimum of 6 test samples shall be taken per ELCAS (M) module or NL causeway section in locations designated by Government Quality Assurance Representatives. If requested by applicator and approved by the Contracting Officer, fewer test sites may be

authorized for piece parts (anchors, winches etc.) when contracted for refurbishment separately.

3.5.1 High-ratio water-based inorganic-zinc coating.

Unless otherwise specified, the high-ratio water-based inorganic-zinc paint specified in 3.2.2 shall be applied to surfaces listed below.

- a. Surfaces that have been abrasive blast cleaned to "near white" in accordance with SSPC-SP10, or
- b. Surfaces that have been brush-off blast cleaned in accordance with SSPC-SP7.

The final DFT of the applied inorganic-zinc shall not be less than 4.0 mils, consisting of a one coating application with multiple passes to achieve the specified final DFT. It is recommended that the applicator and the coating manufacturer concur on the proper application technique to be used prior to painting. In addition to meeting the manufacturer's application requirements, the following requirement shall be apply: Compressed air shall be free of oil and moisture and other contaminants.

3.5.2 Deck coating. Surfaces, as specified herein, shall be coated with the deck coating specified in 3.2.4. Any remaining deck coating after grit blasting in 3.4.2.3 where the aggregate prominently protrudes from the binder surface shall receive a "light recoat" to essentially match the color of adjacent areas where deck coating is applied to the cured inorganic-zinc at the full thickness. Deck coating shall be applied to weather deck walkway surfaces not excluded on Figures 1 through 7. The deck coating shall be applied on top of 4 mils of cured high ratio water-based inorganic-zinc paint or any sprayed-on well-adhered deck coating remaining after surface preparation in 3.4. If required by the deck coating manufacturer, a mist coat sealer may be applied prior to applying the deck coating material. If a mist coat is required, the adhesion requirements specified below for the deck coating also apply to the bonding of the mist coat and the deck coating to the mist coat. The deck coating material shall be applied at a rate of 60 square feet per gallon. In order to produce the uniform application necessary to achieve effective curing and adhesion, the deck coating material shall be applied by spraying. Spray equipment used to apply the deck coating must comply with the coating manufacturer's requirements. The deck coating shall have a finish surface where the aggregate is uniformly dispersed and prominently protrudes above the binder surface. When tested in accordance with ASTM D4541, the fully

**Comment [b1]:** Do we really want to say that. Someone could intrepid this to mean that not require to build the zinc paint back up to 4 mils and could apply the deck coating over bare metal.

cured deck coating shall adhere to the inorganic zinc substrate and remaining deck coating when pull-tested to 200 pounds per square inch (psi) in accordance with ASTM D4541. A minimum of six test samples shall be taken per end item in locations designated by the Government Quality Assurance Representative. The following deck surfaces shall not receive deck coating, and are indicated with cross-hatch marks on Figures 1 through 7:

- a. Hatch and scuttle coamings with their mating surfaces, and bolt heads and nuts shown (see Figures 1, 2, and 3).
- b. Pontoon pipe plugs (see Figure 3).
- c. Stanchion brackets (see Figure 4).
- d. Anchor rub plate (see Figure 4).
- e. Chain plates (see Figure 5).
- f. Registry Number (Identification No.) for each causeway (see Figure 5).
- g. Deck closures (see Figure 5).
- h. Navigation mast base plate and stub mast base foundation receiver (see Figure 5).
- i. Legend for "Lift Here" (see Figure 5).
- j. PH-6, PH-10, and PH-11 padeyes (see Figure 5).
- k. Forward end, P8 and P10 pontoons (see Figure 6).
- l. Foundation for winch if equipped (see Figure 7).
- m. 24-inch rope cleats and D-rings.

3.6 Bare steel surfaces. Where bare steel surfaces are specified, surfaces shall be coated with rust-preventative compound specified in 3.2.3.

3.7 Assembled components. If removed for re-coating, assembled components, such as anchors, 24-inch rope cleats, PH-10 padeyes, A-Frame sheave assemblies, bumper assemblies, etc., shall be blasted to near white in accordance with SSPC-SP10 and repainted as specified in 3.5.1 before re-assembly into the end item.

3.8 Aluminum Mast and Steel Stub Mast. If identified for re-coating, masts shall be brush-off blasted in accordance with SSPC-SP7 and repainted as specified in 3.5.1.

3.9 Scuttles/hatches. If removed for re-coating, engine and pump hatches, scuttle and hatch frames, shall be blasted to near white in accordance with SSPC-SP10 and as specified in 3.5.1.

3.10 Pilot Houses. Pilot house exteriors shall be shall be brush-off blasted in accordance with SSPC-SP7 and repainted as specified in 3.5.1.

3.11 Lifeline Stanchions If so equipped and identified for re-coating, lifeline stanchions shall be brush-off blasted in accordance with SSPC-SP7 and repainted as specified in 3.5.1.

3.12 Battery rack and components. If removed for re-coating, the battery rack and its components shall be brush-off blasted in accordance with SSPC-SP7 and coated with 3.0 mils of green primer conforming to MIL-P-24441/29, and then two coats (3.0 mils each) of dark gray paint conforming to MIL-P-24441/23. Total DFT on the battery rack should be not less than 9.0 mils. The following battery rack components shall not be painted:

- a. The three bushing bores.
- b. The 3/8-inch threaded studs.
- c. The 3/4-inch diameter pin.

3.13 Marking. These special painting requirements shall have a DFT of 2.5 to 3.0 mils minus substrate coating thickness.

3.13.1 Dark gray. The following markings shall be applied using dark gray paint conforming to MIL-P-24441/23: registry numbers, serial numbers, the "Lift Here" legend adjacent to the PH-10 padeyes, and the PH-10 safe working loads.

3.13.2 Yellow. If identified for re-coating, the PH-11 padeyes, the "Lift Here" legend marking background, and the side-load stand-off blocks (on the center module if equipped) shall be brush-off blasted in accordance with SSPC-SP7 and coated with yellow paint conforming to MIL-P-24441/37.

3.14 Coating schedule. A coating schedule shall be prepared to provide a written record of the surface preparation/paint application process plus work zone environmental conditions during the application of inorganic-zinc paint and deck coating. This schedule must be relative to each NL craft, ELCAS (M) module or individual component thereof, i.e., individual pontoons being replaced in a causeway, anchors, battery racks, etc. As a minimum the coating schedule shall document the following:

- a. Abrasive blast to paint interval time.
- b. DFT of remaining zinc coating after cleaning in 3.4.
- c. Blast profile measurements.
- d. Item surface temperature at the start of coating application.
- e. Ambient air temperature at the start of coating application and every two hours during the coating process.
- f. Relative humidity at the start of coating application

- and every two hours during the coating process.
- g. Dew point at the start of coating application and every two hours during the coating process.
  - h. Drying time.
  - i. Adhesion test values for deck coating and inorganic zinc.

3.15 Safety. As a minimum, the provisions of SSPC-PA3 shall be followed and all necessary precautions shall be taken to protect personnel and property from fumes, fire, explosion and other dangers.

3.16 Workmanship. Any coated items that exhibit film failures such as loss of adhesion, blistering, "pin holing", "mud cracking", dry spray, runs or sags shall be rejected. In addition, components or final assemblies delivered in other than "like new" condition shall be rejected.

#### 4. QUALITY ASSURANCE PROVISIONS

4.1 General. The inspection system program shall be subject to review and approval by the Contracting Officer or designated agent. All coated items shall be inspected to verify they meet all applicable requirements of Section 3. The inspections set forth in this specification shall become a part of the contractor's overall inspection system and quality program.

4.2 Responsibility for inspection. Unless otherwise specified in the contract or order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract, the contractor may use his own or any other facilities suitable to perform the inspection requirements specified herein, unless disapproved by the Contracting Officer. The Government or its designated agent reserves the right to perform any test or inspection where such tests or inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.3 Records. The results of all tests, inspection, and monitoring shall be recorded in sufficient detail to satisfy, as a minimum, ISO 9000 and ISO 9001. MIL-I-45208 may be used as a guide. Records shall include the material storage log (see 3.3.1) and coating schedule (see 3.14). All records shall be available for Government review at any time.

4.4 Monitoring procedures for coating. Prepared surfaces, primer and intermediate coated surfaces, finished coated surfaces, bare and uncoated surfaces, and deck coatings shall be inspected after each intermediate process for conformance to the applicable coating requirements specified herein. Cause for rejection shall be any one of the applicable following defects:

- a. Materials or application equipment not conforming to the requirements established in 3.2.
- b. Prepared surfaces not completely free of corrosion products, mill scale, dirt, oil, solvent residue, grease, moisture, deteriorated coating(s), and other surface contaminants in Section 3.
- c. Coating or abrasives on, or damage to equipment and machinery items, threaded surfaces, deck support, or gages.
- d. Total DFT of less than 4.0 mils for inorganic-zinc coating.
- e. Exceeding dew point limits during inorganic-zinc coating and deck coating application and cure processes.
- f. Deck coating application by methods other than spraying.
- g. Failure of deck coating to attain minimum pull strength of 200 psi as specified in Section 3.
- h. Failure of inorganic zinc to attain minimum pull strength of 600 psi as specified in Section 3.
- i. The presence of non-slip coating on surfaces where such coating has not been specified.
- j. The absence of deck coating on surfaces where such coating has been specified.
- k. Bare steel surfaces not coated with rust-preventative compound in 3.6.
- l. Failure to meet material or DFT requirements specified for battery rack in 3.12 and marking in 3.13.
- m. Evidence of film failures on coated surfaces such as loss of adhesion, dry spray, blistering, rusting, pin holing, checking, cracking, runs or sags, greater than one square inch in any 1000 square inches.
- n. The presence of any surface contaminants on the dry film, as specified in Section 3.
- o. Delivery of finished products with specified coatings in other than "like new" condition.
- p. Application of deck coating material of more than 65 square feet per gallon or less than 55 square feet per gallon.
- q. Steel blast profile greater than 2 mills.

## 5. PACKAGING

5.1 Preparation for delivery. The provisions of SSPC-PA1, Section 12, "Drying and Handling of Painted Steel", shall be followed.

6. NOTES

6.1 Intended use. This specification is intended to establish the recoating requirements and quality assurance provisions applicable to Sealift Support Facilities (SSF) equipment during overhaul by government entities and commercial contractors.

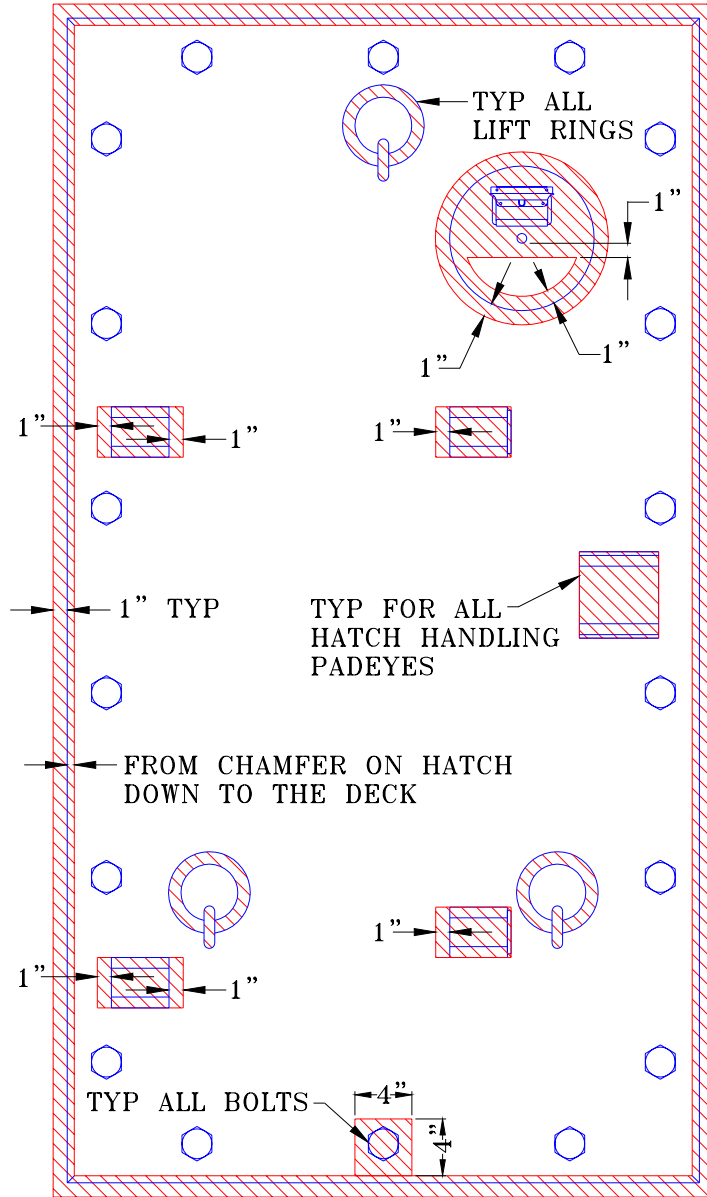


Figure 1. Starboard pump hatch shown typical (TYP) for all pump and engine hatches.

**Comment [b2]:** I don't think we have to have the half moon of nonskid on the emergency steering cover. I know that during the FMS contract we let LSI leave this off.

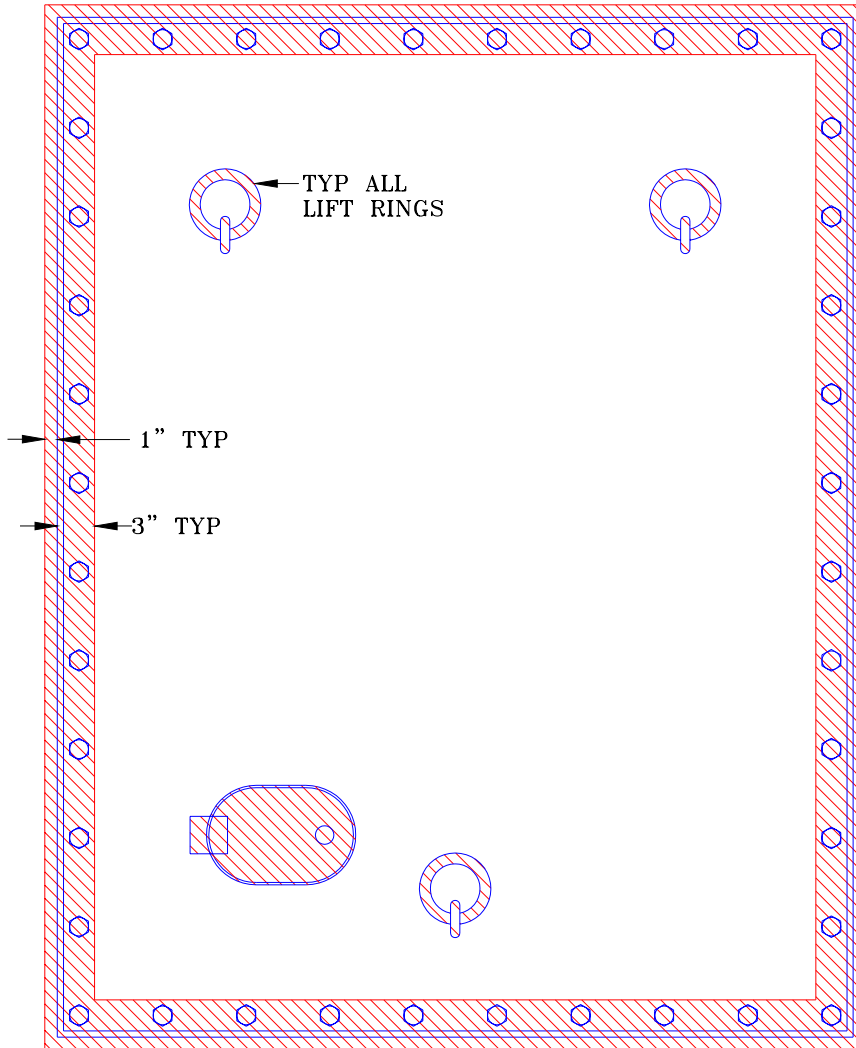


Figure 2. Fuel tank hatch.

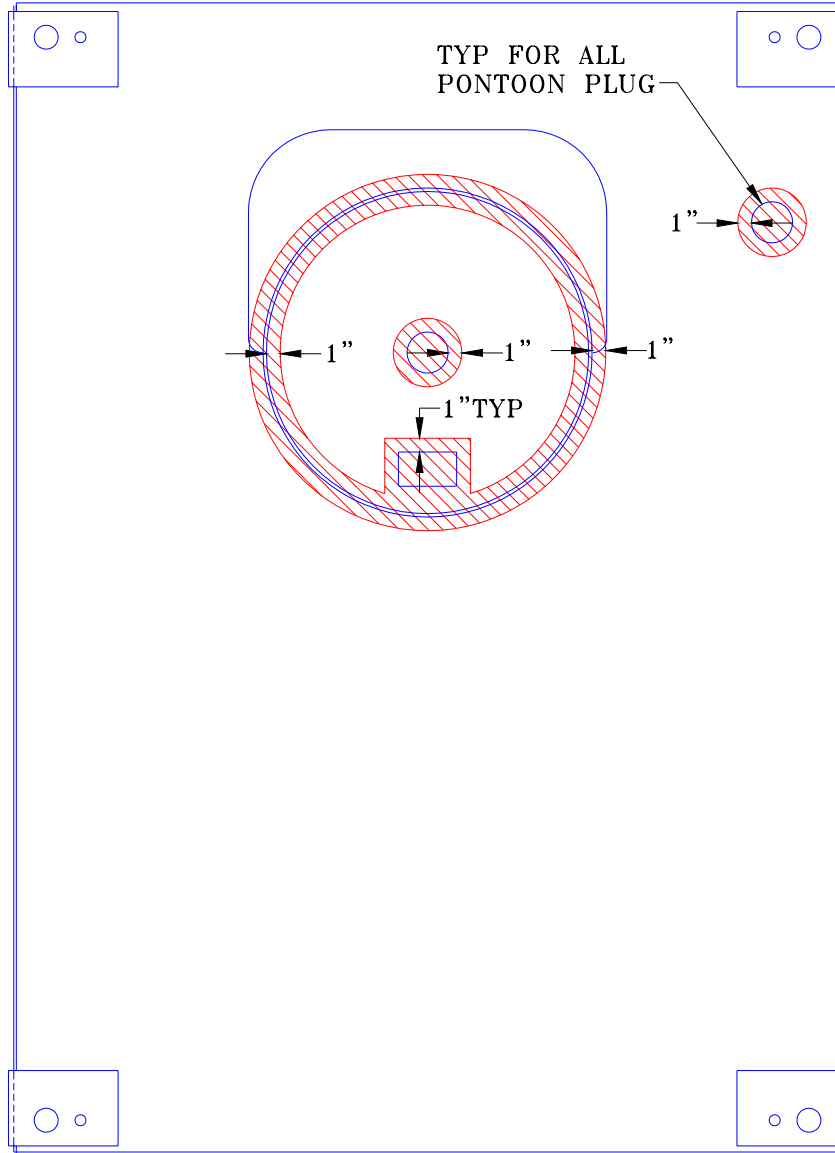


Figure 3. Flush profile scuttle shown typical for raised profile scuttles.

**Comment [b3]:** This figure needs to be updated. There are still causeways in use that have flush profile scuttles but we no longer make P-1-H6 and P-1-H6S pontoons which have been replaced with P-11 pontoons that have raise profile scuttles.

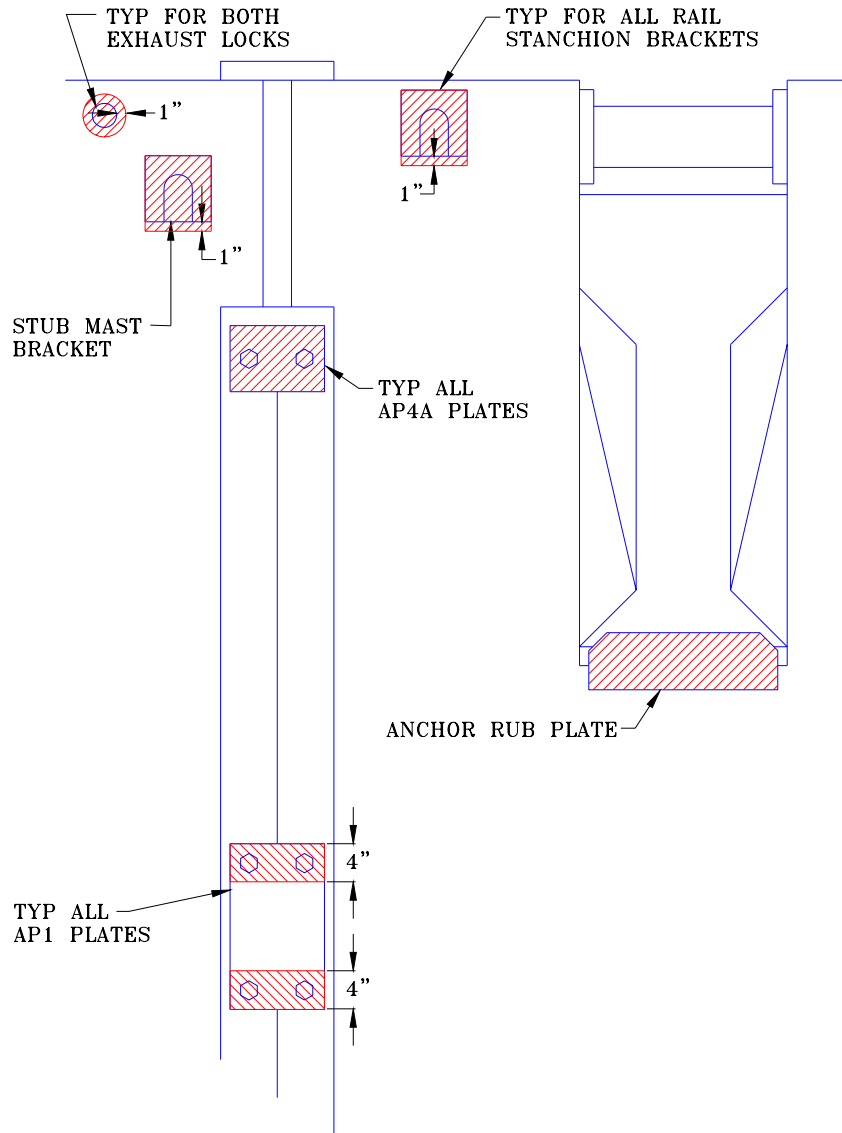


Figure 4. Aft end.

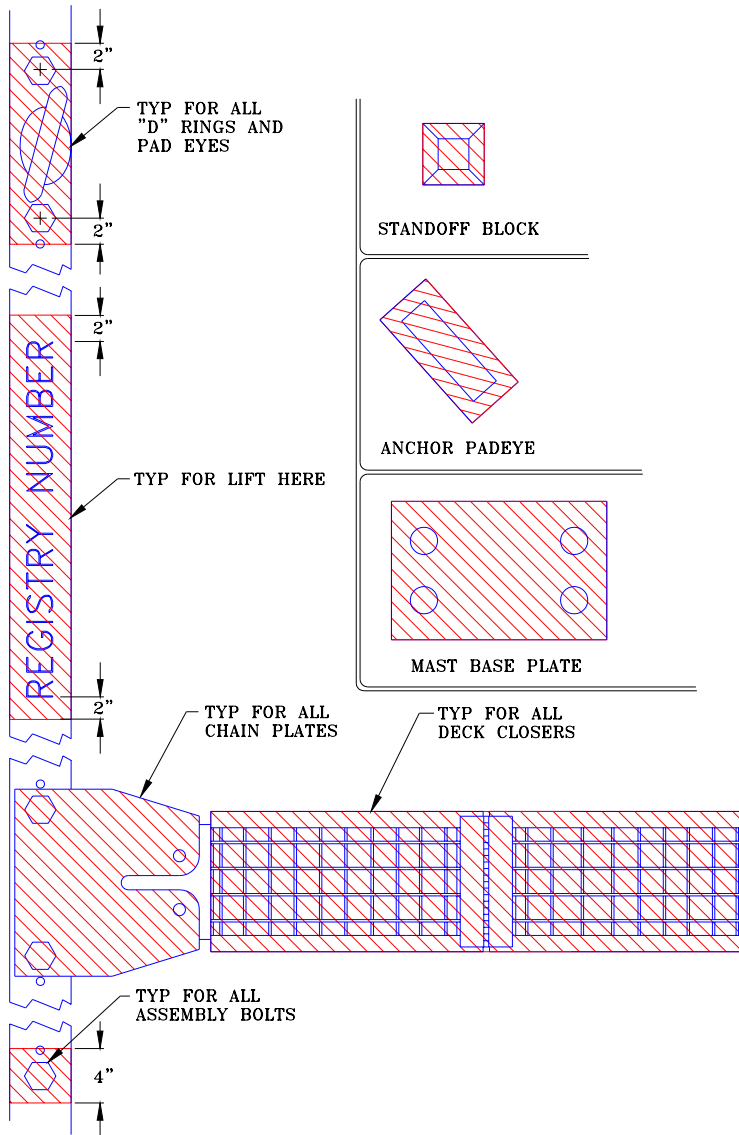


Figure 5. Miscellaneous fittings.

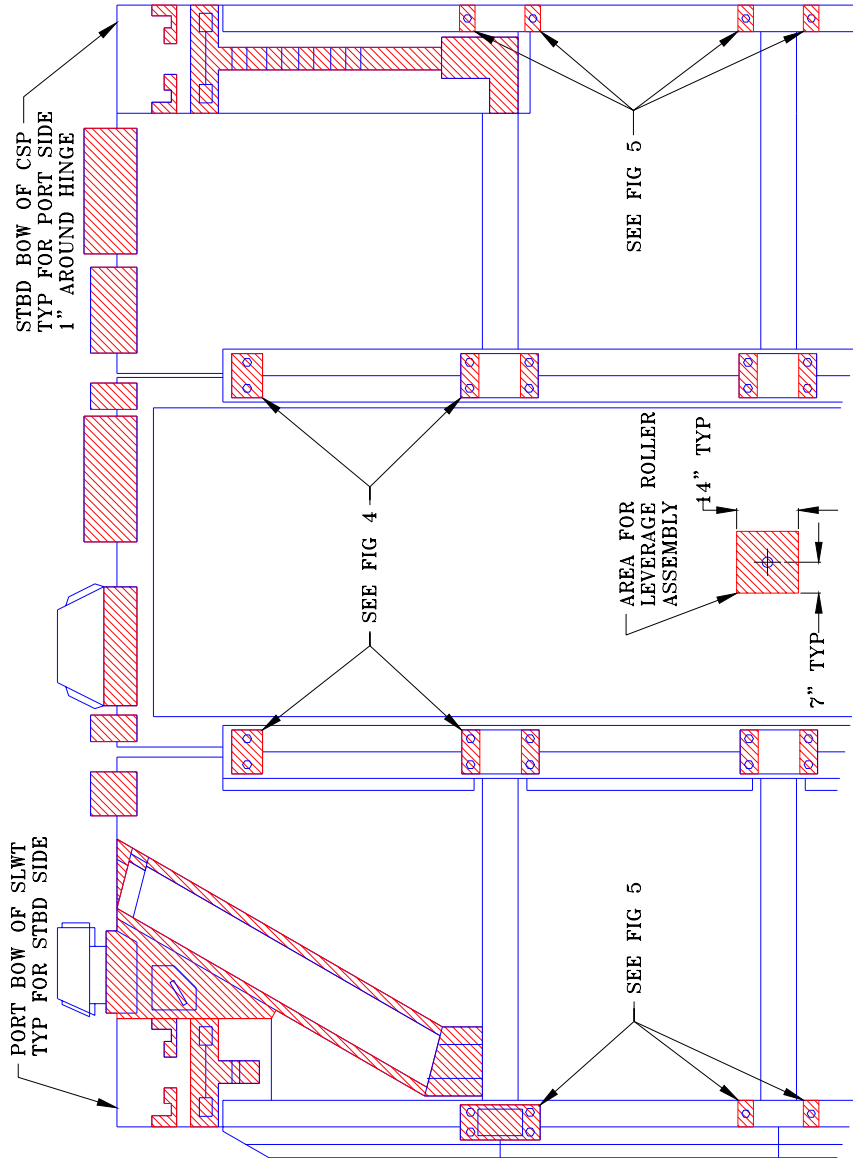


Figure 6. Forward end WT/CSP.

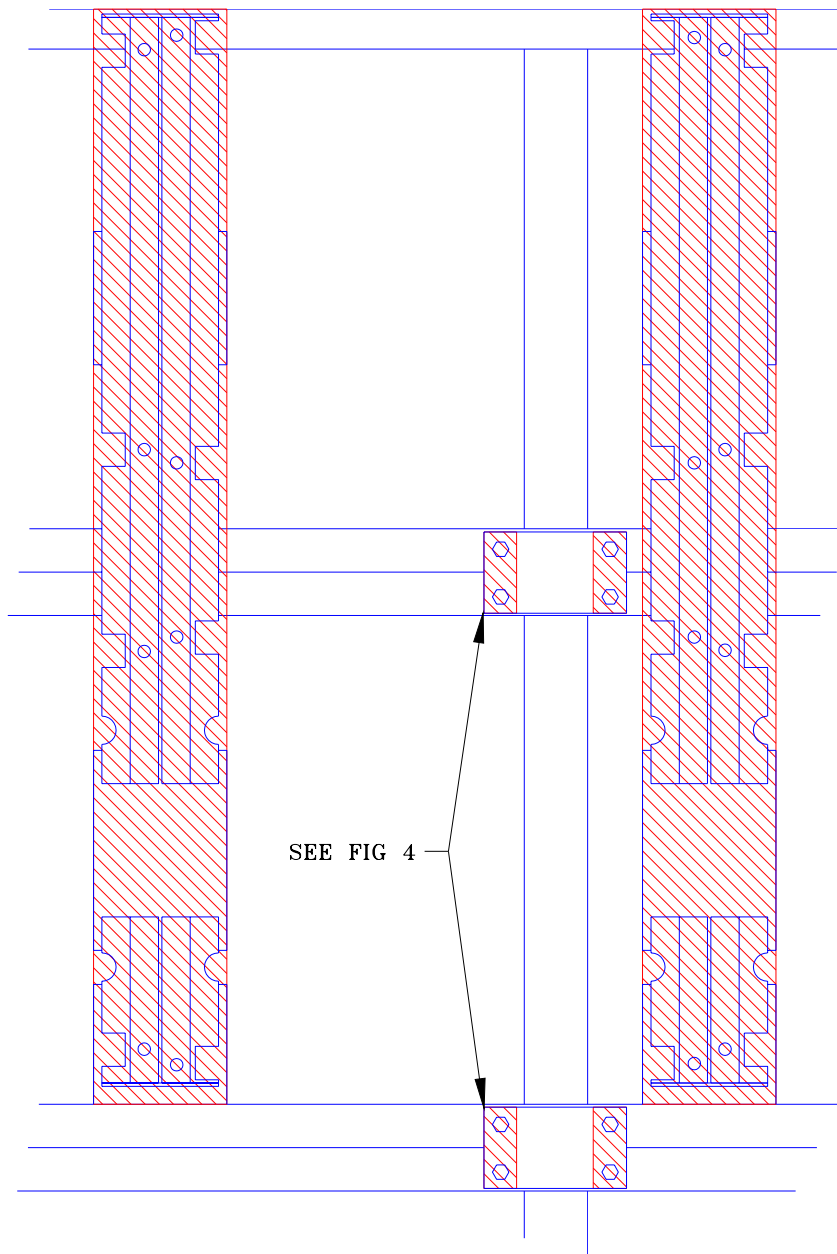


Figure 7. Winch skid assembly.