

Special Specification XXXX

Dry Docking 28 Car Diesel Electric Ferryboats



1. DESCRIPTION

Provide dry docking, cleaning, painting, and repair work on 28-car diesel electric ferryboats.

2. MATERIALS AND EQUIPMENT

Provide all labor, materials, equipment, and tools including but not limited to mooring, lines, and line handling, gangway, and shifting ferryboats as necessary to complete the work, unless otherwise specified. Furnish all safety materials, testing, and devices necessary to perform the work in a safe and orderly manner.

Dispose of all hazardous materials pumped from the ferryboats in accordance with all federal, state, local laws, regulations, and ordinances. Provide the Department a manifest within 30 days after completion of disposal action.

All paints and coating products used must be lead free.

3. CONSTRUCTION

The Department will deliver each ferryboat to the Contractor at a mutually agreed upon time and place. After completion and acceptance of the work on each ferryboat, the Department will receive each ferryboat at the Contractor's place of business at a time mutually agreed upon by the Contractor and the Department. The Department will crew the ferryboats to and from the Contractor's yard.

Comply with the United States Coast Guard (USCG), American Bureau of Shipping (ABS), and the requirements for these items. Notify the Department the commencement of work. Provide the Department with access to the premises while the Contractor is performing work.

Start work when notified by the Department. It is the intention of the Department that the Contractor will work on one ferryboat at a time. Continue work on ferryboat until work is complete. The Department reserves the option to defer the work on any ferryboat to a later time.

Take all necessary precautions to protect the existing equipment, areas, and furnishings during the execution of the work. Upon arrival at the shipyard seal off the intakes to prevent any media or dust from entering the intakes which include:

- main engines,
- ship service generators,
- emergency generators, and
- any air duct or blower that enters a machinery space.

Keep water out of ferryboats while ferryboats are being worked on and the deck hatches are open. Close the deck hatches and pump the bilges out if water is present after completion of the various jobs on each ferryboat. If the liquid in the bilges is due to the Contractor having the hatches open unnecessarily or for any other reason caused by the Contractor, the pumping of the bilges will be done at the Contractor's expense.

Repair or replace any damages, including all coating systems or steel work damaged due to work floats, dry-dock, bank, and gangway, to ferryboats caused by the Contractor while they are in the Contractor's possession to the satisfaction of the Engineer and at the Contractor's expense.

If any item requires a gas free certificate, such tests will be performed by a marine chemist. Testing will include but is not limited to testing for oxygen content, explosive gases, or poisonous gases. Gas free certificates needed, other than those required by items of work, will be performed only after authorized by the Engineer. Provide a copy of each gas free test certificate to the Engineer after completion of testing.

Keep ferryboat clean and free of all waste and trash, including but not limited to welding rods, empty cans and boxes, rags, oil and grease, removed steel, pieces trimmed off during fitting, blasting media, and dust. Clean up oil and grease on the deck plates to prevent accidents and staining.

Perform all work, including inspections and testing, in compliance with all Occupational Safety and Health Administration (OSHA), ABS, and USCG rules and regulations.

All welding must be in accordance with ABS and USCG rules and procedures. Use ABS and USCG certified welders in accordance with the latest revision to *1980 Rules for Building and Classing Steel Ferryboats for Service on Rivers and Intercostal Waterways*, ABS, Chapter 13. Provide certification papers, upon request, to the Department.

4. INITIAL ITEMS OF WORK

4.1. Dry Docking.

Provide dry dock and required setup to dry dock the ferryboat. Furnish all utilities, including daily electrical charges, scaffolds, crews, tow boats, line handlers, and overhead crane needed for the dry docking. Perform a complete test of all equipment before removing the boat from the water. This includes but is not limited to:

- electrical,
- electronics,
- lighting,
- electric starters,
- electric motors,
- pumps,
- valves,
- engines,
- gears,
- generators,
- doors,
- locks,
- cameras,
- sound powered phone,
- supply and exhaust fans,
- deck operators,
- vents,
- open close all sounding tubes, and
- air compressor.

Provide a detailed summary within 10 consecutive days of vessel arriving at the yard. Summary must include:

- items not working properly,
- recommendation of repair,
- pictures,
- printed copy of the report, and
- an itemized quote or estimate cost for each item of work needed, including parts and labor.

Only one dry docking fee per work request will be paid for each ferryboat. Dry docking not approved by the Department will be done at Contractor's expense.

4.2. **Utility Hook Up.**

Provide three phase electrical service to each ferryboat using the following procedures:

- hook up shore power at plug on main car deck of ferry,
- check phase rotation before energizing,
- remove and store the shore power receptacle,
- connect shore power leading directly to existing shore power wires,
- do not cut wire terminals off when connecting or disconnecting shore power, and
- do not connect to the main panel buss work.

4.3. **Gas Free Certificate.**

Provide one gas free certificate per work order to cover all items, unless otherwise approved. Each compartment will be gas free in accordance with Special Specification 7044, "Ferryboat Coating System," Section 7044.4.4., 'General Painting Requirements.' Provide a copy of certificate to the Department representative and provide access to all parts of the work for proper inspection.

4.4. **Gantt Chart.**

Provide a Gantt chart, including critical path items, to show a schedule of work to be performed and completion times. Hold weekly production meetings. Provide the Department with an office, designated parking area for up to two full size trucks, and one mid-size vehicle access to a copier, fax machine, and telephone (computer, monitor, internet connection with email access).

4.5. **Open Rudder and Steering Compartments.**

Provide work and access to inspect rudder and steering compartments as follows:

- open the hatch covers, any sounding tub and valve covers;
- install new gaskets for each hatch cover;
- grease all grease points;
- install sounding tub and valve covers with anti-seize;
- install each manhole cover, adjust hatch to ensure a watertight seal and test for any leaks;
- reinstall the hatch covers as original after all inspections and repairs are completed; and
- install protective safety covers while opened.

Open hatch covers before obtaining the original gas free certificate for entry and hot work on the vessel.

4.6. **Open Ballast Tanks.**

Provide work and access to inspect ballast tanks as follows:

- open the hatch covers, any sounding tub and valve covers;
- disconnect one side of the strong back for entry;
- install new gaskets for each hatch cover and bolt;
- clean all dirt, rust, paint, and trash from the threads on strong back crossbar for hatch bolt;
- install each hatch cover using new 3/16 stainless steel bolts with anti-seize on each bolt. Adjust hatch to ensure a watertight seal and test for any leaks;
- reinstall hatch covers as original after all inspections and repairs are completed; and
- install protective safety covers while open.

Open manhole covers before obtaining the original gas free certificate for entry and hot work on the vessel.

Tanks will be inspected by the Department representative.

Open hatch covers before obtaining the original gas free certificate for entry and hotwork on the vessel.

4.7. **Open Motor Room Escape Hatch.**

Provide work and access to inspect motor escape hatch as follows:

- open the hatch covers, any sounding tub and valve covers;
- install new gaskets for each hatch cover;
- grease all grease points;
- install sounding tub and valve covers with anti-seize;
- install each escape hatch, adjust hatch to ensure a watertight seal and test for any leaks;
- reinstall the hatch covers as original after all inspections and repairs are completed;
- install protective safety covers while opened; and
- covers should provide adequate protection against the weather and debris and meet all safety and OSHA regulations for open manhole covers or to the Department representative's satisfaction.

4.8. **Open Motor Room Soft Patch.**

Remove soft patch as follows:

- remove all bolts, gasket, metal shielding, piping, electrical, and insulation that may get damaged when removing soft patch;
- mechanically clean all surfaces of any debris to ensure a good watertight fit;
- recoat any bare areas in accordance with Special Specification 7044, "Ferryboat Coating Systems," Section 7004.4.14. 'Vehicle Deck,' and Section 7044.4.14.3., 'System "C" – Non-Skid Epoxy System;'
- clean all threads for bolts to ensure that bolts are not damaged;
- install new gasket with a marine grade silicone to both sides of the gasket;
- reinstall soft patch, install new bolts same grade and type that was removed;
- smooth silicone to make flat even seal to the car deck;
- test with fresh free water for a minimum of 5 continuous minutes to the Department representative's satisfaction;
- install protective safety covers while opened; and
- cover should provide adequate protection against the weather and debris and meet all safety and OSHA regulations for open manhole covers or to the Department representative's satisfaction.

4.9. **Open and Clean Fuel Tanks.**

Open fuel tanks and clean as follows:

- remove all bolts;
- remove all fuel from the tanks and store it in a clean holding tank until all work is done, fuel tanks are clean, all bolt holes and threads are clean, and tanks have been inspected by the Department representative and to their satisfaction;
- install new gaskets, reinstall the hatch covers, and new bolts same as removed;
- put the fuel back in tank through filtering system to ensure no contaminants or water make it back into the tanks;
- check tanks for level and water;
- test tank covers with water hose (freshwater test should last a minimum of 5 min. for each tank to ensure there are no leaks);
- fuel will be checked and tested for water 2 hr. after test has finished;
- ensure tanks are free of water; and

- if water is present, re-filter and test fuel until there is no water or to the Department representative's satisfaction at no additional cost to Department.

The tanks must meet all requirements put forth by the Department or OSHA for confined space entry and must be maintained at any time work is being performed. Not to be used in conjunction with the gas free certificate. Open manhole covers before obtaining the original gas free certificate for entry and hot work on the vessel.

4.10. **Open and Clean Oily Water Tank.**

Provide work and access to inspect oily water tank manhole covers as follows:

- remove tank lids, remove any oily waste from tank, remove vent bell, plug, and drains;
- clean and flash all piping going to and from tank to ensure there are no obstructions in the line;
- hydro blast and clean interior of storage tanks;
- test all drains and vents to the Department representative's satisfaction;
- replace gaskets;
- perform all inspections and repairs to the Department representative's satisfaction;
- reinstall manhole cover;
- replace all bolts with the same grade and type bolts; and
- install protective safety covers while opened.

The tanks should meet all requirements put forth by the Department or OSHA for confined space entry and must be maintained at any time work is being performed not in conjunction with the gas free certificate.

Open manhole covers before obtaining the original gas free certificate for entry and hot work on the vessel.

4.11. **Open and Clean Waste Oil Tank.**

Provide work and access to inspect waste oil tank manhole covers as follows:

- remove tank lids, remove any waste oil from tank, remove vent bell, plug, and drains;
- clean and flash all piping going to and from tank to ensure there is no obstructions in the line;
- test all drains and vents to the Department representative's satisfaction;
- hydro blast and clean interior of oily water storage tanks;
- replace gaskets;
- perform all inspections and repairs to the Department representative's satisfaction;
- reinstall manhole cover;
- replace all bolts with the same grade and type bolts; and
- install protective safety covers while opened.

The tanks should meet all requirements put forth by the Department or OSHA for confined space entry and must be maintained at any time work is being performed not in conjunction with the gas free certificate.

Open manhole covers before obtaining the original gas free certificate for entry and hot work on the vessel.

4.12. **Open Air Receivers.**

Perform work of air receivers before inspection as follows:

- discharge all air from the two air receivers in the engine room;
- unbolt and remove inspection ports from the two air receivers for ease of inspection;
- renew the inspection ports utilizing new string reinforced neoprene gasket material; and
- clean interior of air receiver tanks to make visible to USCG Inspector; the Engineer will coordinate the inspection of the air receivers with the Contractor.

Upon completion of the inspection:

- reassemble and close the inspection ports with new gaskets;
- re-pressurize the compressed air system;
- test the inspection port gasket surfaces for leakage; and
- adjust, repositioning of gasket, tightening of nut, etc., as needed.

Provide a written report to the Department representative of the findings that includes the names of the employees and testers present at time of inspection.

Prepare and coat all new and disturbed areas in accordance with Special Specification 7044, "Ferryboat Coating Systems," Section 7044.4.12., 'Above Deck Plates – Void or Shaft Alleyways Engine Room.'

5. TESTING AND INSPECTING

5.1. Inspect, Repair or Replace Overboard Discharge Valves and Check Valves.

Remove valve and check valve. Disassemble valve and inspect, if needed. Provide a written report of inspection findings and recommendations, with pictures, if requested by Department representative or U.S. Coast Guard. Remove and disassemble discharge valves and check valves if needed to perform inspection.

Overhaul the overboard discharge valves in the following sequence:

- replace discharge valve 2 in. or smaller with 300 lb., stainless steel, screwed bonnet, solid disc, rising stem type valves;
- discharge valves 2-1/2 in. or larger;
- remove the bonnets;
- remove the packing;
- clean the inside of the discharge valves;
- grind-in the discharge valves; and
- assemble the discharge valves in proper working order.

Overhaul the overboard check valves in the following sequence:

- replace check valves 2 in. or smaller with 300 lb., stainless steel, metal seat, screwed cap check valves;
- check valves 2-1/2 in. or larger;
- remove the tops;
- remove the old gaskets;
- remove the checks;
- clean the bodies;
- reseal the stops; and
- install new gaskets.

Assemble check valves in proper working order. Reinstall valve. Test to ensure proper fit, there are no leaks, and the valve is working properly.

5.2. Hydraulic Steering System.

Test, clean, and inspect hydraulic system. Test the complete hydraulic system from tank to hydraulic cylinder and then back to the tank. This item includes, but is not limited to the following:

- piping,
- fittings,
- cylinders,
- control blocks,
- counter balance blocks,

- cartridges,
- O-rings,
- filters,
- valves,
- fluids,
- pumps,
- motors,
- hoses,
- seals, and
- disposal of old parts.

Inspect complete hydraulic system from tank to hydraulic cylinder and back to the tank. Check for leaks, sand, dirt, trash, or anything in the system that may cause the system to fail. Provide a report and pictures of any findings, make recommendations, and present an itemized parts list to the Department representative to bring system up to manufacture's specification within 10 consecutive days, from first full day boat is at yard or when the Department representative agrees to start time.

Flash complete system; inspect inside of tank to ensure clean and free of any foreign materials that may obstruct system; refill system with new fluid, and retest to ensure system works to factory specification or to the Department representative's satisfaction.

5.3. **Hydraulic Barrier Gate System.**

Test, clean, and inspect hydraulic system. Test the complete hydraulic system from tank to hydraulic cylinder and back to the tank. This item includes, but is not limited to the following:

- piping,
- fittings,
- cylinders,
- control blocks,
- counterbalance blocks,
- cartridges,
- O-rings,
- filters,
- valves,
- fluids,
- pumps,
- motors,
- hoses,
- seals, and
- disposal of old parts.

Inspect complete hydraulic system from tank to hydraulic cylinder and back to the tank. Check for leaks, sand, dirt, trash, or anything in the system that may cause the system to fail. Provide a report and pictures of any findings, make recommendations, and present an itemized parts list to the Department representative to bring the system up to manufacture's specification within 10 consecutive days, from first full day boat is at yard or when the Department representative agrees to start time.

Flash complete system; inspect inside of tank to ensure clean and free of any foreign materials that may obstruct system; refill system with new fluid, and retest to ensure system works to factory specification or to the Department representative's satisfaction.

5.4. **Test CO₂ system and fire Alarm System.**

Test and recertify complete CO₂ and fire alarm system to the Department representative satisfaction as follows:

- remove all hoses and cables;
- disconnect power and any device needed to make system safe for workers on vessel;
- remove all exterior parts;
- lights;
- horns;
- boxes;
- wires;
- replace all batteries in CO₂ and alarm system; and
- check all wire, terminals, and connections.

Provide any reports, pictures, and or repair needed or recommended to the Department representative.

Provide a list of findings within 10 consecutive days of vessel arriving at the yard., The list should include but not be limited to:

- description of the item needing repairs (provide pictures of the item if possible), recommendation of the repair, and a printed copy of the report;
- an itemized estimated cost including parts and labor;
- after all repairs and painting, reinstall all equipment that was removed and replace all watertight packing or devices needed to ensure water tight integrity;
- test and recertify system and all devices in the CO₂ and alarm system with the U.S. Coast Guard and Department representative present; and
- provide a copy of any test procedures and certification to the Department representative before the vessel leaves the shipyard.

6. CLEANING ITEMS

6.1. Clean Rudder Compartment.

Clean the rudder compartment as follows:

- clean all areas in the space. Pressure wash the entire space with detergent type degreaser at 2,800-3,000 psi;
- pressure wash to remove all oils, grease, and stains;
- hand clean in areas of heavy deposits;
- protect all mechanical and electrical equipment or any other devices that may be harmed by the cleaning process to preclude the entry of water;
- protect all perforated aluminum sheathing in overhead and entrances in such a manner as to preclude the entrance of water into the insulation behind it;
- pump the ballast tank out after washing and dispose of all waste material in an approved manner; and
- clean the area to the satisfaction of the Department representative.

6.2. Clean Ballast Tank.

Clean ballast tank as follows:

- clean all areas in the space. Pressure wash the entire space with detergent type degreaser at 2800-3000 psi;
- pressure wash to remove all oils, grease, and stains;
- hand clean in areas of heavy deposits;

- protect all mechanical and electrical equipment or any other devices that may be harmed by the cleaning process to preclude the entry of water;
- protect all perforated aluminum sheathing in overhead and entrances in such a manner as to preclude the entrance of water into the insulation behind it;
- pump the ballast tank out after washing and disposing of all waste material in an approved manner; and
- clean the area to the satisfaction of the Department representative.

6.3. **Motor Room.**

Ensure the space under the fuel tanks and framework supporting the deck plates are clean before facilitating an inspection. Clean motor room above and below the deck plates as follows:

- unbolt the deck plates before cleaning;
- remove all deck plates, degrease, and pressure wash;
- re-bolt the deck plates after cleaning;
- clean and wipe down hull plating for inspection;
- use a vacuum truck and dispose of the waste removed from the alley ways in an approved manner; and
- clean to the satisfaction of the Department representative.

Removal includes, but is not limited to, the pumping of water, removing dirt, sludge, grease, grime, rags, trash, and any other items found in alleyways. Removal of these items is not to be used in conjunction with prepare and paint motor room above deck or below deck.

6.4. **Clean Engine Room Above Deck Plates.**

Clean engine room above deck plates as follows:

- clean area including engine room above floor plates;
- pressure wash the engine room with detergent type degreaser at 2,800 to 3,000 psi;
- pressure wash to remove all oils, grease, and stains;
- hand clean in areas of heavy deposits;
- protect all mechanical and electrical equipment or any other devices that may be harmed by the cleaning process to preclude the entry of water;
- protect all perforated aluminum sheathing in overhead and entrances in such a manner as to preclude the entrance of water into the insulation behind it;
- pump the engine room bilge out after washing and dispose of all waste material in an approved manner; and
- clean engine room above deck plates to the satisfaction of the Department representative.

All deck plates will be removed from engine room to be degreased and pressure washed.

6.5. **Clean Engine Room Below Deck Plates.**

Clean the engine below deck plates from where the deck plates meet the hull plating down to and including the keel. Clean upper and lower sides of the deck plates and the angle supports they are bolted to. Unbolt deck plates before cleaning. Clean and wipe down the hull plating for inspection. Secure plates after all inspections have been made, painting has been completed, and approval has been received from the Department representative.

This item of work includes but is not limited to:

- pumping the bilge's free of diesel fuel, oil, and water;
- removing dirt, sludge, grime, rags, trash, and any other items found in the bilge;
- wiping the hull plating dry for inspection;
- re-bolting all deck plates using stainless steel bolts or screws; and

- all deck plates will be removed from engine room to be degreased and pressure washed.

6.6. Maintenance Main Motors and VFD's.

Maintenance Main Motors and VFD's as follows:

- grease the #1 and #2 main motors with Mobilux EP3 grease, 4,500 hr. requirement;
- 12 mon. inspection, check the torque on main power connections;
- 24 mon. inspection, check I/O terminals and control I/O terminals, clean cooling tunnel, check operation of cooling fan, check for corrosion on terminals, bus bar, and other surfaces;
- check door filters and change if necessary;
- megger test main motors; and
- perform periodic inspection from manual.

6.7. Clean Motor and All Drive Cabinets and Filters

Clean motor and all drive cabinets and filters as follows:

- grease the #1 and #2 main motors, with Mobilux EP3 grease, 4,500 hr. requirement, 12 mon. inspection, and check the torque on main power connections;
- 24 mon. inspection, check I/O terminals and control I/O terminals, clean cooling tunnel, check operation of cooling fan, check for corrosion on terminals, bus bar, and other surfaces;
- check door filters and change if necessary;
- megger test main motors;
- perform periodic inspection from manual;
- check, clean, and inspect all wires, connectors, terminals, fuses, lights switches, breakers, and batteries in the generator alarm panels;
- generator control and switch board (BO1);
- 480 Volts AC main switch board (BO1);
- main propulsion VFD #1 (EO1);
- AC VSD & 6 pulse active filter #1 (EO1);
- main propulsion VFD #2 (EO2);
- AC VSD & 6 pulse active filter #2 (EO2);
- FWD pilot house console (KO1);
- AFT pilot house console (KO2);
- center pilot house console (KO3);
- engine room pilot house console (KO4);
- alarm I/O #1 (LO1);
- alarm I/O #2 (LO2);
- main propulsion motor #2 (HO1);
- main propulsion motor #1 (HO1);
- provide a report to Department representative within 10 calendar days of the boat arriving at the shipyard; and
- perform the periodic safety test procedure (PSTP) with the US Coast Guard and the Department representative present

7. REMOVE AND REINSTALL.

7.1. Remove and Replace Rub Rail.

Remove and replace worn and damaged rub rail sections of piping with the same size and diameter of existing rub rail.

7.2. **Removal of Suction Strainers.**

Remove suction strainers from two steering compartments, four ballast tanks, four shaft alley ways, and three from engine room bilge. Reinstall all strainers in spaces using new stainless-steel bolts, washers, nuts, stainless steel hose clamps, and hoses to reconnect strainers to suction lines.

7.3. **Remove Keel Cooler.**

Remove, clean, flush, reinstall, and fill as follows:

- remove all the guards;
- remove all coolant from engines, keel coolers, and holding tank;
- remove keel cooler from hull;
- clean any growth from coolers, presser wash, and clean to the Department representative's satisfaction;
- flush coolers with fresh water;
- clean all flanges and cover with approved blanks made for flanges to ensure they remain free of dirt and debris and will not be painted. Reinstall after any painting to the hull is finished;
- reinstall guards;
- install new zinc anodes;
- install grounding straps and isolation mount and test to the Department representative's satisfaction;
- fill all engines with 50/50 power cool off-highway coolant, keel coolers, and holding tank. This may take up to 400 gal.;
- bleed off any air in lines; and
- check for any leaks before putting vessel back in water.

When vessel is back in water for at least 48 hr., run engine for a minimum of 4 to 8 hr. with a Department representative on sight to verify that the engine does not overheat.

7.4. **Remove, Clean, and Reinstall Sea Valves.**

The USCG requires an inspection of sea-chest valves every 2 yr. The term "sea valves" as used in this Item, is the first valve in each line coming from the sea chest. It may be a sea valve, blow down valve, or vent valve.

Remove, clean, and reinstall sea valves as follows:

- remove all sea valves from the sea chest. Removal of valve includes "entire" valve body, seat, gate, and stem for USCG Inspector;
- clean gate, valve seat, and pressure test each valve at minimum of 50 lb. and furnish a written report to the Engineer certifying that the pressure check was performed and satisfactory for inspection by USCG and the Engineer;
- re-install valves when approval is received from USCG and the Engineer;
- install the sea valves in proper working order with new gaskets on each side of valve after inspection;
- close all sea valves when they are installed in vessel;
- operate all sea valves once the vessel is taken out of the dry dock; and
- tighten the packing if necessary.

Prepare and coat all new and disturbed areas in accordance with Special Specification 7044, "Ferryboat Coating System," Section 7044.4.13., 'Below Deck Plates-Void or Shaft Alleyways and Engine Room,' and Section 7044.4.13.4. 'System "D" – Mechanical Clean with Modified Coating Requirements.'

7.5. **Remove and Reinstall Underwater Sea Chest Strainer.**

Remove the sea chest strainer plates from sea chest to allow the Department representative and the USCG to visually inspect the inside of the sea chest. After the inspection and performing any needed repairs,

reinstall the sea chest strainer plates as original. Prepare and paint all new and disturbed areas in accordance with Special Specification 7044, "Ferryboat Coating Systems", Section 7044.4.5., 'Hull Waterline Down,' and Section 4.5.2., 'System "B" – Sand, Sweep and Spot Blast.' Apply a final topcoat of tin-based anti-foul by brush to inner and the outer side of strainer plate.

7.6. **Remove and Reinstall Anodes.**

Remove and reinstall anodes as follows:

- remove all existing anodes and straps from the vessel before the hull is cleaned;
- furnish new anodes meeting or exceeding the following specifications:
 - M-24 Zinc Anodes,
 - Dimensions: 6 in. x 12 in. x 1-1/4 in.,
 - nominal weight 22.5 lb.,
 - contain two cast-in galvanized steel mounting straps, and
 - current rating: 1 amp-yr.;
- paint all new and disturbed areas in accordance with Special Specification 7044, "Ferryboat Coating Systems," and Section 7044.4.5., 'Hull Waterline Down;,' and
- after the hull is painted, weld the new anodes to the vessel at places designated by the Engineer.

Note 1—Each ferry requires 94 anodes.

7.7. **Repair or Replace Fuel Shut Off.**

Repair or replace fuel shut off valve from deck, replace steel, install 90° gear boxes, and new fuel shut off. The vendor will provide all parts and materials to perform work. All parts must meet or exceed USCG rule for fuel shut off valves. The Department representative will need to approve all parts and materials before work starts after all hot work is finished. Prepare and paint in accordance with Special Specification 7044, "Ferryboat Coating System," using the method for the section where repairs were made.

7.8. **Remove and Replace Plate on Bulwarks and Superstructure.**

Remove and replace deteriorated or damaged steel plating on bulwarks (including inside bracing), corners, cap rails, superstructure, and wheelhouse. Obtain Department representative approval of areas of repair before starting work. White metal blast all new plating and welds. Apply full coat of zinc-rich epoxy at 5.0 mils wet for 3.0 mils dry before installation. Apply remainder of coatings after installation in accordance with Special Specification 7044, "Ferryboat Coating Systems," Section 7044.4.7., 'Bulwarks and Pilothouse,' Section 7044.4.10., 'Exterior Steel Superstructure,' and Section 7044.4.8., 'Interior Deck Lockers.'

Coat all new and disturbed areas in accordance with Special Specification 7044, "Ferryboat Coating Systems," Section 7044.4.7., 'Bulwarks and Pilothouse,' and Section 7044.4.8., 'Interior Deck Lockers.'

7.9. **Remove and Replace Plate on Hull.**

Remove and replace deteriorated or damaged steel plating on Hull with like material approved by the Department representative. Steel must be ABS and have proper paperwork to identify steel (including steel inside bracing). Obtain Department representative approval of areas of repair before starting work. White metal blast all new plating and welds. Apply paint system coatings after installation in accordance with Special Specification 7044, "Ferryboat Coating Systems," Section 7044.4.5., 'Hull Waterline Down,' Section 7044.4.5.3., 'System "C" – Sandblast to Near White Metal,' Section 7044.4.6., 'Hull Waterline Up To and Including Rub Rail,' and Section 7044.4.6.2., 'System "B" – Sandblast to Near White Metal.'

7.10. **Remove and Reinstall Tail Shaft.**

Remove and reinstall tail shaft as follows:

- remove the tail shaft from the boat. Send out to machine shop for inspection of the bearings, bearing retainer sleeve, shaft, and any other parts or work needed to bring back to drawing (original plans);
- remove both aft and forward Johnson Cutlass bearings, clean and inspect, and bring back to (original plan) drawing specification;
- remove SIMPLEX SIMPLAN model 135 shaft seal, clean, inspect, and bring back to specification;
- remove the shaft coupling, clean and inspect, and bring back to factory specification;
- provide a report, pictures of any findings, recommendations, and an itemized parts list to bring bearings and shaft back to (original plan) drawing specification to the Department representative within 10 consecutive days from first full day boat is at yard or when the Department representative agrees to start time;
- reinstall both aft and forward Johnson Cutlass bearings and bring back to (original plan) drawing specification;
- reinstall tail shaft to (original plan) drawing specification;
- reinstall SIMPLEX SIMPLAN model 135 shaft seal and bring back to (original plan) drawing specification;
- reinstall the shaft coupling back to factory specification; and
- realign from main engine to propeller as per (original plan) drawing specification.

7.11.

Remove or Reinstall Aft and Forward Line Shaft.

Remove or reinstall aft and forward line shaft as follows:

- remove the aft and forward line shaft. Send out to machine shop to clean, inspect, test, and any other parts or work needed to bring back to drawing specification;
- inspect adjustable chocks Vibracon sm20 cs mounts;
- inspect craft or cooper bearings not to be used in conjunction with Refurbish Cooper Bearing;
- remove the shaft brake and all components needed to complete this line;
- remove the shaft coupling clean and inspect, bring back to factory specifications;
- provide a report, pictures of any findings, recommendations, and an itemized parts list to bring bearings and shaft back to the original construction specification to the Department representative within 10 consecutive days from first full day boat is at yard or when the Department representative agrees to start time;
- reinstall the aft and forward line shaft to original construction plans specification;
- reinstall aft and forward line shaft to original construction plans specification; and
- reinstall craft or cooper bearing to original construction plans specification.

General Notes concerning removal and reinstallation of shafts are as follows:

- material and workmanship must conform to USCG requirements for Subchapter "T" vessels and ABS rules for steel vessels for service on rivers and intercostal waterways;
- all sections of shafting must be straight with respect to the centerline within a tolerance of 0.005 in. for every 48 in.;
- fiberglass shaft coating will be described by Navy manual 0919-lp-008-0010 and as shown on Detail 2-2a;
- keys and keyway must be manufactured for a Class 2 sliding fit. Keyways to have 1/8 in. bottom radius and spooned ends per 4-3-2 / Figure 1 of ABS rules for building and classing steel vessels 2008. Keys and keyways must be finished to 63 rms after machining. Sharp corners and tool or grinding marks must be removed;
- shafting, coupling, coupling bolts, and keys must be forged steel, fully annealed, and meet ABS requirements for Grade 2 machine forgings;

- installation must be to manufacturer's instructions for shaft brake, bearings, couplings, propeller nut and seals;
- shaft for only one end is shown. The other end to be similar;
- tail shaft bearings are to set using chock fast orange resin installed in accordance with manufacturer's recommendations. Surfaces in contact with resin are to be coated with release agent;
- RTD type bearing temperature detectors must be installed in shaft seal and pillow block bearings for engine room reading of temperatures. See construction plans for the Ferry which are available upon request;
- a shaft tachometer system must be tested to allow determination of shaft rpm and rotation at the pilot house consoles. See the construction plans;
- exposed polished shaft surface at each end of the shaft coupling must be protected against corrosion with plastic heat shrunk sleeve;
- adjust shaft lengths as required to suit manufactured configuration;
- pillow block bearings and reduction gear must be aligned on Vibracon adjustable chocks. Installation must be in accordance with manufacturer's recommendation. See the original construction plans for the shaft alignment procedures; and
- after final alignment, alignment dowels must be installed at reduction gear, pillow block bearing, shaft seal, and bulkhead seal.

7.12. **Replace Cameras.**

Remove old camera and replace with the following.

7.12.1. **Deck Camera.**

Deck Camera should be replaced with the following:

- Pelco Sarix series day/night, IP color camera;
- 13 M2.8-12 series day/night lens 1/3 in. format, auto iris (direct drive), if corrected; and
- Pelco EH20 -P-H Series enclosure ceiling, pedestal, or wall mount

New camera must be placed in same location as camera removed.

This Item must include but is not limited to the following:

- mounting bracket,
- covers,
- braises,
- nuts,
- bolts,
- washers,
- connectors,
- clamps,
- straps,
- wire packing,
- conduit,
- watertight connectors,
- disconnect and reconnect camera,
- disconnect and reconnect monitor or recorder, and
- disposal of old parts.

Test to ensure system works to factory specification or to the Department representative's satisfaction.

7.12.2. **Engine and Rudder Room Camera.**

Remove old camera and replace with BU6 Series 650 TV Lines High Resolution Camera.

This Item must include but is not limited to the following:

- mounting bracket,
- sun shield,
- covers,
- braises,
- nuts,
- bolts,
- washers,
- connectors,
- clamps,
- straps,
- wire packing,
- conduit,
- watertight connectors, and
- disconnect and reconnect camera.

Test to ensure system works to factory specification or to the Department representative's satisfaction.

7.13. **Replace Camera Wire.**

Remove the old wire and replace with the following specified wire: ETL LISTED CAT5E F/UTP 4PR 24AWR 35MHZ direct burial UV Outdoor, including any equipment and incidentals necessary to perform this work or remove the old wire and replace it as directed.

This Item must include but is not limited to the following:

- remove existing wire,
- connectors,
- clamps,
- straps,
- wire packing,
- conduit,
- watertight connectors,
- disconnect and reconnect camera,
- disconnect and reconnect monitor or recorder, and
- disposal of old parts.

Test to ensure system works to factory specification or to the Department representative satisfaction.

7.14. **Replace Radio Antenna Wire.**

Remove existing radio antenna wire and replace with new radio antenna wire, same as existing, or as directed.

New wire must be placed in same location as removed. This Item must include but is not limited to the following:

- remove existing wire,
- connectors,
- clamps,

- straps,
- wire packing,
- conduit,
- watertight connectors,
- disconnect and reconnect any junction boxes, and
- disposal of old parts.

Test to ensure system works to factory specification or to the Department representative's satisfaction.

7.15. **Replace Electrical Wire 10-4.**

Remove existing wire and replace with new 10-4 conductor aluminum armor marine cable or as directed, not to exceed, but not limited to 10-4 conductor aluminum armor marine cable.

New wire must be placed in same location as removed. This Item will include but is not limited to the following:

- remove existing wire;
- connectors;
- clamps;
- straps;
- wire packing;
- conduit,
- watertight connectors;
- disconnect and reconnect any junction boxes, plugs, switches, or lights; and
- disposal of old parts.

Test to ensure system works to factory specification or to the Department representative's satisfaction.

7.16. **Replace Electrical Wire 12-4.**

Remove existing wire and replace with 12-4 conductor aluminum armor marine cable not to exceed, but not limited to 12-4 conductor aluminum armor marine cable.

New wire must be placed in same location as removed. This Item must include but is not limited to the following:

- remove existing wire;
- connectors;
- clamps;
- straps;
- wire packing;
- conduit,
- watertight connectors;
- disconnect and reconnect any junction boxes, plugs, switches, or lights; and
- disposal of old parts.

Test to ensure system works to factory specification or to the Department representative's satisfaction.

7.17. **Replace Electrical Wire 14-4.**

Remove existing wire and replace with 14-4 conductor aluminum armor marine cable or as directed, not to exceed, but not limited to 14-4 conductor aluminum armor marine cable.

New wire must be placed in same location as removed. This Item must include but is not limited to the following:

- remove existing wire;
- connectors;
- clamps;
- straps;
- wire packing;
- conduit;
- watertight connectors;
- disconnect and reconnect any junction boxes, plugs, switches, or lights; and
- disposal of old parts.

Test to ensure system works to factory specification or to the Department representative's satisfaction.

7.18. **Remove Lower Rudder.**

Inspect lower rudder, bolts, nuts, O-rings, washers, keyways, bearings, pintle, and all mounting surfaces.

Provide a report, pictures of any findings, recommendations, and an itemized parts list to bring rudder back to specification to the Engineer within 10 consecutive days from first full day boat is at the yard or when Department representative agrees to start time.

Remove lower rudder as follows:

- replace all bolts, nuts, O-Rings, and washers with the same as was removed or the same as specified in the original plans;
- machine to size the pintle and the bearing to the (original plan) drawing;
- machine mounting surfaces to drawing specification to ensure meets specification;
- reinstall lower rudder back to the (original plan) drawing specification;
- presser test all rudder void areas and repair to (original plan) drawing specification;
- plans and drawing specification for this line will be provided upon request;

Additional general requirements from rudder drawings are as follows:

- material and workmanship must conform to USCG requirements for Subchapter "T" vessels and ABS rules for steel vessels for service on rivers and intercostal waterways;
- upon completion, rudder voids must be air tested at 3 psi for leaks;
- after air test, fill and drain rudder voids with a float coat of environmentally benign material;
- piping must be supported with resiliently lined hangars, poly block or similar, in accordance with ASTM F708; and
- machine shop must verify all dimensions and tolerances before machining.

See systems parts list for material specifications, found on original drawings.

7.19. **Remove Upper Rudder.**

Inspect upper rudder, bolts, nuts, O-rings, washers, keyways, bearings, shaft, and all mounting surfaces.

Remove upper rudder as follows:

- remove the steering cylinders from tiller arm and inspect pin and clevis from the cylinder for both cylinders;
- replace bronze washer with new to meet (original plan) drawing specification;
- replace the bronze bushing with new to meet (original plan) drawing specification;

- remove and replace all the grease zerk fitting with 316 stainless steel zerk fitting of same size as removed and clean grease channel;
- remove the retainer tab bolt to tiller;
- remove 4-1/4 in. 4un-2B hex nut;
- remove the tiller arm;
- remove the key from tiller arm;
- remove thrust washer;
- remove thrust bearing, Thordon SXL;
- remove cap ring;
- replace neoprene O-ring with new to meet (original plan) drawing specification; and
- replace carrier bearing Thordon SXL and neck bearing Thordon SXL with new to meet (original plan) drawing specification.

Send all parts to the machine shop for inspection and ensure all parts meet dimensions and tolerances set forth in (original plan) drawing specification.

Provide a report, pictures of any findings, recommendations, and an itemized parts list to bring rudder back to specification to the Engineer within 10 consecutive days from first full day boat is at yard or when the Department representative agrees to start time. Replace all or machine any parts, as needed, to bring upper rudder in to (original plan) drawing specification.

Reinstall upper rudder to meet all (original plan) drawing specification.

Test to ensure that meets USCG requirements for Subchapter "T" vessels and ABS rules for steel vessels for service on rivers and intercostal waterways.

7.20.

Replace Batteries

Replace generator batteries, fire pump batteries, and engine batteries with gel batteries of same volt and amps as the batteries in place or to the Department representative's specification.

Replace the 24 V power back up, two in engine room and two outside of the pilot house, with A.G.M. batteries of same volt and amps as batteries in place or to the Department representative's specification.

Replace the batteries for the camera batteries of same volt and amps as batteries in place or to the Department representative's specification.

Check clean or replace all connections, wires, and connectors. Test chargers and settings for the type of batteries installed. Dispose of old parts and batteries.

7.21.

Remove and Replace Engine.

Remove Cummins qsk19 with new or factory certified (rebuilt with all factory test reports and dyno testing reports). All rebuilt engines should meet all factory specification and will be retested for a minimum 25% for thirty minutes, 50% for thirty minutes, 75% for thirty minutes, and 100% for two continuous hours with the Department representative present. Test will be running continually. If the test is stopped, the test will be restarted without any cost to Department. Copies of all paperwork and test reports should be given to the Department representative before engine is put in to the vessel. After engine is put back in the vessel and completely reinstalled, engines will be retested for a minimum 25% for thirty minutes, 50% for thirty minutes, 75% for thirty minutes, and 100% for two continuous hours with the Department representative present. Test will be running continually. If the test is stopped, the test will be restarted without any cost to Department.

This line includes but is not limited to:

- removal of engine and reinstallation, including removal and reinstallation of engine room Soft Patch;

- any tools needed for removal;
- lifting eyes;
- hoses;
- clamps;
- nuts;
- bolts;
- oil;
- coolant;
- fuel, this includes for all testing;
- filters;
- fitting;
- parts; and
- all parts needed to complete the job.

Department crew will test run the vessel. After the test run, all filters must be changed before vessel leaves the shipyard back to Port Aransas.

7.22.

Remove and Replace Generators

Remove and replace the generator from the Cummins engine. Replace the generator with new generator, with the same as removed test reports. All rebuilt generators should meet all factory specifications and will be retested for a minimum 25% for thirty minutes, 50% for thirty minutes, 75% for thirty minutes, and 100% for two continuous hours with the Department representative present. Test will be running continually. If the test is stopped, the test will be restarted without any cost to Department.

This line includes but not limited to:

- removal and installation of generators;
- all tools needed for removal;
- lifting eyes;
- hoses;
- wires;
- terminals;
- clamps;
- nuts;
- bolts;
- fuel, this includes for all testing;
- fitting;
- parts; and
- other parts needed to complete the job.

Department crew will test run the vessel before it returns to Port Aransas.

7.23.

Remove and Replace Marine Gears

Remove and replace Twin Disc Marine Gears MGE-5204SC with new or factory certified (rebuilt with all factory test reports). All rebuilt gears should meet all factory specifications and will be retested for a minimum 25% for thirty minutes, 50% for thirty minutes, 75% for thirty minutes, and 100% for two continuous hours with the Department representative present. Test will be running continually. If test is stopped, test will be restarted without any cost to Department. Copies of all paperwork and test reports should be given to the Department representative before the Marine Gears are put into the vessel.

This line includes but not limited to:

- removal of gear and reinstallation;
- all tools needed for removal;
- lifting eyes;
- hoses;
- clamps;
- nuts;
- bolts;
- oil;
- coolant;
- fuel, this includes for all testing;
- filters;
- fitting;
- parts; and
- other parts needed to complete the job.

Department crew will test run the vessel. After the test run, all filters will be changed before it returns to Port Aransas.

7.24. **Remove and Replace Drive Motor.**

Remove Marelli motor and replace with new, same as removed as follows:

- disconnect all wiring;
- remove coupling and change with new, same as removed;
- remove all mounting bolts;
- remove the soft patch, not to be used in conjunction with Open Motor Room Soft Patch. See Section 7044.4.8., "Interior Deck Lockers;"
- replace cooling fan with the same as removed;
- reconnect all wiring;
- reinstall coupling and change with new, same as removed;
- replace all mounting bolts with the same size and grade as removed; and
- replace the soft patch in accordance with Section 7268.4.8., "Open Motor Room Soft Patch."

This line includes but not limited to:

- removal of engine and reinstallation,
- all tools needed for removal,
- lifting eyes,
- hoses,
- clamps,
- nuts,
- bolts,
- fitting,
- parts,
- grease, and
- all items needed to complete the job.

All rebuilt gears should meet all factory specifications and will be retested for a minimum 25% for thirty minutes, 50% for thirty minutes, 75% for thirty minutes, and 100% for two continuous hours with the Department representative present. Test will be running continually. If test is stopped, test will be restarted without any cost to Department. Copies of all paperwork and test reports should be given to the Department representative.

7.25. **Remove and Replace lights.**

Remove and replace LED light fixtures with same as removed. Work will include but not limited to wire, lights, labor and various items necessary to perform this work to the Department representative for approval.

In accordance with the procedures specified in Special Specification 7044, "Ferryboat Coating Systems," coat all new and disturbed areas.

7.26. **Remove and Replace LED Emergency light**

Remove and replace LED emergency light with same as removed. Work will include, but not limited to, wire light labor and various incidentals necessary to perform this work to the Department representative for approval.

In accordance with the procedures specified in Special Specification 7044, "Ferryboat Coating Systems," coat all new and disturbed areas.

7.27. **Rebuild or Replace Diesel Fire Pump Motor and Skid.**

Remove Diesel fire pump motor and skid rebuild or replace as follows:

- disassemble and clean all parts and accessories;
- provide a recommendation in writing to Department representative;
- provide a detailed parts list with all parts and part numbers to be used in rebuild;
- provide a cost for rebuild and a cost to replace with new pump motor and skid, also estimate time for repair and return to Department representative within 10 consecutive days; and
- coat all new and disturbed areas in accordance with Special Specification 7044, "Ferryboat Coating Systems," using the procedure specified for the part of the vessel.

7.28. **Rebuild or Replace Fire or Bilge Pump Motor and Skid.**

Remove electric fire pump motor and skid rebuild or replace as follows:

- disassemble and clean all parts and accessories;
- provide a recommendation in writing to Department representative;
- provide a detailed parts list with all parts and part numbers to be used in rebuild; and
- provide a timeline and a cost for rebuilding pump motor and skid, and a timeline and cost to replace with a new pump motor and skid to the Department representative within 10 days of starting the work.

Coat all new and disturbed areas in accordance with Special Specification 7044, "Ferryboat Coating Systems," using the procedure specified for the part of the vessel.

7.29. **Remove and Replace Pilot House Floor.**

Remove electric fire pump motor and skid rebuild or replace as follows:

- disassemble and clean all parts and accessories;
- provide a recommendation in writing to Department representative;
- provide a detailed parts list with all parts and part numbers to be used in rebuild; and
- provide a timeline and a cost for removal and replacement of the pilot house floor to the Department representative within 10 days of starting the work.

Coat all new and disturbed areas in accordance with Special Specification 7044, "Ferryboat Coating Systems," using the procedure specified for the part of the vessel.

7.30. **Remove and Replace Pilot House Floor**

Remove and replace pilothouse floor as follows:

- remove and replace the wood quarter round and tile;
- clean and prep floor;
- apply one coat of Poly Spec IMO sealer grout coat;
- apply Poly Spec IMO base coat waterproofing membrane;
- apply rubber tile adhesive,
- install Flexco Rubber tile; and
- sand and refinish quarter round to match the existing wood trim.

7.31. **Replace the pilot house Air-Conditioner.**

Remove and replace pilothouse air-conditioning system with the same air conditioning system that was removed.

7.32. **Complete Oil and Filter Change**

Complete Oil and Filter Change on all filters and all equipment. This work includes, but is not limited to:

- oil filter,
- fuel filters,
- water filters, and
- air filters.

Replacements should be of the same as removed or to the factory recommendation. Any substitution must be approved by the Department representative before the substitution is installed.

The equipment is as follows:

- cummins engine,
- twin Disc Marine Gears MGE-5204SC,
- quincy air compressor,
- diesel fire pump,
- barrier gate pumps,
- steering pumps,
- EPD drive cabinets,
- VFD filter cabinets, and
- air conditioner filters.

Fill all equipment with factory recommended oil test run for a minimum of 1 hr. to check for leaks. A proper function test will be witnessed with a Department representative present. If any leaks or problems are found, test will stop, and repairs or problems will be corrected and test will restart.

7.33. **Remove and Replace 5/8 in. Head Log Plate.**

Remove and replace 5/8 in. head log plate with same material that was removed.

8. PIPING

Install or Remove and Replace Piping.

Remove and replace piping, found to be in bad condition, with new piping of the same type pipe as removed and join by Tig welded, or to Department representative satisfaction. Piping will include but not limited to

pipe, angle, unions, coupling, and tees. Piping must be CU-NI 90/10 ASTM B-466 Class 200 seamless pipe. Fitting must be CU-NI 90/10 ASTM B 466 or SB 467 Class 200. Prepare and paint in accordance with Special Specification 7044, "Ferryboat Coating System," using the method for the section where repairs were made.

9. STEEL PIPING

9.1. Install or Remove and Replace Piping.

Remove and replace piping found to be in bad condition with new piping of the same type pipe as removed and join together by the same method as piping removed, or to the Department representative's satisfaction. Piping will include but not limited to pipe, angle, unions, coupling, and tees. Piping must be ASTM A-106 seamless pipe. Fitting must be 300# M.I. ASTM A197. Prepare and paint all new and disturbed areas in accordance with Special Specification 7044, "Ferryboat Coating System," using the method for the section where repairs were made.

9.2. Install or Remove and Replace 3 in. Piping.

Remove and replace piping found to be in bad condition with new piping of the same type pipe as removed and join by the same method as piping removed, or to Engineer's Specification. Piping will include, but not limited to, pipe, angle, unions, coupling, and tees. Piping must be ASTM A-106 seamless pipe. Fitting must be ASTM A-234 tested, to ensure there are no leaks. The Department representative will approve replacement methods before work begins and verify test after work is completed.

Prepare and paint all new and disturbed areas in accordance with Special Specification 7044, "Ferryboat Coating System," using the method for the section where repairs were made. Remove, repair, and reinstall upper rudder shaft and lower rudder shaft (blade).

10. STAINLESS STEEL PIPING

10.1. Install or Remove and Replace with 316 Stainless Steel Piping.

Remove and replace piping found to be in bad condition with new piping of the same type pipe as removed and join together by the same method as piping removed, or to Department Specification. Piping will include but not be limited to pipe, angle, unions, coupling, and tees. Piping must be ASTM A182 TP 316 seamless stainless-steel pipe. Fitting must be 3000# stainless steel type 316 ASTM A 182. Prepare and paint all new and disturbed areas in accordance with Special Specification 7044, "Ferryboat Coating System," using the method for the section where repairs were made.

11. TUBING

11.1. Remove and Replace Tubing 316 Seamless Stainless-Steel Tubing.

Remove and replace tubing, found to be in bad condition, with new 316 seamless stainless-steel pipes or the same type Tubing as removed or to the Department representative's satisfaction.

12. VALVES

12.1. Remove and Replace Valves.

Remove all valves found in non-working order. Replace with new valve. Valve body will be 125# bronze U.B. SCR'D ASTM B- 62 and valve trim will be bronze. Documentations must be provided to Engineer before installation. Install in working order with new gaskets. Test to ensure there are no leaks. Department representative will approve replacement before work begins and verify test after work is completed. Prepare

and paint all new and disturbed areas in accordance with Special Specification 7044, "Ferryboat Coating System," using the method for the section where repairs were made.

12.2. Remove and Replace 3 in. Valves.

Remove all valves found in non-working order. Replace with new valve. Valve body must be C.I. ASTM A-126 125 LB flange and valve trim must be bronze removable seats STD. Trim documentations must be provided to Engineer before installation. Install in working order with new gaskets. Test to ensure there are no leaks. The Department representative will approve replacement before work begins and verify test after work is completed. Prepare and paint all new and disturbed areas in accordance with Special Specification 7044, "Ferryboat Coating System," using the method for the section where repairs were made.

13. DUCTILE IRON VALVES

13.1. Remove and Replace Valves.

Remove all valves found in non-working order and replace with new valves. Valve body must be 125# bronze U.B. SCR'D ASTM A395 ANSI B16.10, valve trim must be bronze, and stem will be stainless steel. Documentations must be provided to Engineer before installation. Install new valves in working order. Test to ensure there are no leaks. The Department representative will approve replacement before starting work and verify test after work is completed. Prepare and paint all new and disturbed areas in accordance with Special Specification 7044, "Ferryboat Coating System," using the method for the section where repairs were made.

13.2. Remove and Replace 3 in. Valves.

Remove all valves found in non-working order and replace with new valves. Valve body must be C.I. ASTM A395 ANSI B16.10 125 LB flange and valve trim must be bronze removable seats STD. Trim documentation must be provided to Department representative before installation. Install in working order with new gaskets. Test to ensure there are no leaks. The Engineer will approve replacement before starting work and verify test after work is completed. Prepare and paint all new and disturbed areas in accordance with Special Specification 7044, "Ferryboat Coating System," using the method for the section where repairs were made.

14. FLAT BAR

14.1. Install or Remove and Replace Flat Bar.

Remove and replace deteriorated and damaged flat bar in various areas of the vessel with steel flat bar. Obtain Department representative approval of areas of repair before starting work. Prepare and paint all new and disturbed areas in accordance with Special Specification 7044, "Ferryboat Coating System," using the method for the section where repairs were made.

15. ANGLE IRON

15.1. Install or Remove and Replace Angle Iron.

Crop out and replace wasted away steel angle iron in all areas of vessel as required in the original construction plans. Prepare and paint all new and disturbed areas in accordance with Special Specification 7044, "Ferryboat Coating System," using the method for the section where repairs were made.

16. PROPULSION ITEMS

16.1. Remove and Reinstall Shaft Brake.

Remove and reinstall shaft brake as follows:

- remove shaft brake;

- check rotor wear and check run out; and
- replace brake pads, reinstall shaft brake, and test

16.2. **Refurbish Cooper Bearing.**

Provide labor and material to open, disassemble, clean, reassemble, and lubricate Cooper bearings per specifications. Repair any damage to Cooper bearings caused by the Contractor during disassembly or assembly at no additional cost to the Department.

16.3. **Replace Cooper Bearing.**

Provide and install new Cooper bearing when results from Section 7268.16.2, "Refurbish Cooper Bearing," finds a bearing showing signs of failure. Department representative will approve the replacement. Replacement type will be the same as original.

16.4. **Remove and Reinstall Propeller.**

Remove the propeller in the following sequence:

- remove the rope guard, if required;
- gouge off the strap that locks the wheel nut to the prop;
- gouge off the strap that locks the wheel nut to the jam nut;
- remove the two nuts and store;
- remove the propeller;
- make up the propeller nut hot, cold, and then hot again; and
- install straps to lock nut to propeller and nut to jam nut.

Contractor will deliver and pickup items from the machine shop. Testing for this Item of work is covered under Section 7268.16.5., "Dye Test Prop for Cracks and Check Pitch of Prop," and repairs are covered under Section 7268.16.7., "Re-Pitch Prop." If the propeller is deemed unusable, the Department will provide a new propeller for installation. Reinstall the original, new, or reconditioned propeller in reverse order.

16.5. **Dye Test Prop for Cracks and Check Pitch of Prop.**

Machine shop will clean prop, dye test prop for cracks, and check pitch of each blade on prop. Machine shop will provide results of testing to the Department representative.

16.6. **Balance Prop.**

Machine shop will re-balance and re-condition each blade on prop. Provide results of testing to the Department representative.

16.7. **Re-Pitch Prop.**

Machine shop will re-pitch prop to original that is stamped in each prop. Stamped information on each prop indicates the proper pitch required.

16.8. **Repair Prop-Welding of Cracks.**

Machine shop will make repairs by gouging and grinding cracks out to the deepest point, leaving no signs of voids or cracks indicated by the dye-test. Make repair welds with stainless steel to match prop material. Cracks will be welded. Machine shop will dye-test repair to ensure quality of weld. Machine shop will then re-pitch prop using Section XXXX.16.7., "Re-Pitch Prop," for payment. The Engineer and USCG will be present when repairs are made to prop by machine shop, if necessary.

17. PAINTING ITEMS
17.1. Prepare and Paint Hull Water Line Down.

Prepare and paint the hull from the water line down. Remove or cover all zinc anodes, wheels, keel coolers, and any other equipment or items that the Engineer may deem critical. After the hull area is cleaned, the Contractor will make a recommendation in writing as to which system to use. The Department representative will determine which system to use, either System "A," "B," or "C." Only one system will be paid per vessel at the ship yard on this line.

17.1.1. Prepare and Paint Hull Water Line Down "System A."

Prepare and paint the hull from the water line down in accordance with Special Specification 7044, "Ferryboat Coating Systems," Section 7044.4.5., 'Hull Waterline Down,' and Section 7044.4.5.1., 'System "A" – Water Blast.'

17.1.2. Prepare and Paint Hull Water Line Down "System B."

Prepare and paint the hull from the water line down in accordance with Special Specification 7044, "Ferryboat Coating Systems," Section 7044.4.5., 'Hull Waterline Down,' and Section 7044.4.5.2., 'System "B" – Sand, Sweep and Spot Blast.'

17.1.3. Prepare and Paint Hull Water Line Down "System C."

Prepare and paint the hull from the water line down in accordance with Special Specification 7044, "Ferryboat Coating Systems," Section 7044.4.5., 'Hull Waterline Down,' and Section 7044.4.5.3., 'System "C" – Sandblast to Near White Metal.'

17.2. Prepare and Paint Hull Water Line Up.

Prepare and paint hull water line up. Remove or cover any equipment or items that the Department representative may deem critical. For System "A" or "B," only one system will be paid per vessel at the ship yard on this line.

17.2.1. Prepare and Paint Hull Water Line Up "System A."

Prepare and paint the hull from the water line up including rub rail to the bulwarks in accordance with Special Specification 7044, "Ferryboat Coating Systems," Section 7044.4.6., 'Hull Waterline Up To and Including Rub Rail,' and Section 7044.4.6.1., 'System "A" – Sand, Sweep and Spot Blast.'

17.2.2. Prepare and Paint Hull Water Line Up "System B."

Prepare and paint the hull from the water line up including rub rail to the bulwarks in accordance with Special Specification 7044, "Ferryboat Coating Systems," Section 7044.4.6., 'Hull Waterline Up To and Including Rub Rail,' and Section 7044.4.6.2., 'System "B" – Sandblast to Near White Metal.'

17.3. Prepare and Paint Bulwark

Prepare and paint bulwarks from top of rub rail to the bridge, including under side of bridge over main car deck back down to main car deck, this includes pedestrian's seating area, engine room access area, the anchor windless area, and all areas in between, including but not limited to hand rail and overhead areas not to include car deck or the "A" deck floor. Remove and store all plugs, lights, junction boxes, speakers, horns, fire station boxes, and any equipment that the Department representative may deem critical. Cover or remove all tags, signs, valves, windows and trim, doors, seats, and glass. All wiring is to be covered or removed to ensure that there is no damage or paint will get on wire. Any wire or equipment deemed critical that is damaged or painted will be replaced without any charge to the Department representative, in the

same manner as it was installed, or to the Engineer specification. For Systems "A" and "B," only one system will be paid per vessel at the ship yard on this line.

17.3.1. **Prepare and Paint Bulwarks "System A."**

Prepare and paint the bulwarks from rub rail to main deck in accordance with Special Specification 7044, "Ferryboat Coating Systems," Section 7044.4.7., 'Bulwarks and Pilothouse,' and Section 7044.4.7.1., 'System "A" – Sand, Sweep and Spot Blast.'

Prepare and paint from rub rail up over the bulwarks back down to the main deck including walk area, tire rub rail, interior and exterior of fueling station, etc..

Remove engine room vents, vent closure covers, and holders. Blast and paint on shore. Reinstall vents with new gaskets.

17.3.2. **Prepare and Paint Bulwarks "System B."**

Prepare and paint the bulwarks from rub rail to main deck in accordance with Special Specification 7044, "Ferryboat Coating Systems," Section 7044.4.7., 'Bulwarks and Pilothouse,' and Section 7044.4.7.2., 'System "B" – Sandblast to Near White Metal.'

Prepare and paint from rub rail up over the bulwarks back down to the main car deck including walk area, tire rub rail, interior and exterior of fueling station, etc..

Remove engine room vents, vent closure covers, and holders. Blast and paint on shore. Reinstall vents with new gaskets.

Apply one full coat of zinc-rich epoxy regardless of the paint manufacturer's recommendations.

17.4. **Prepare and Paint Steering Compartments.**

Prepare and paint rudder and steering compartments. Cover or remove all tags, signs, valves, and glass. All wiring and hoses are to be covered or removed to ensure that there is no damage or paint will get on wire and hoses or equipment deemed critical. Any wire or equipment deemed critical that is damaged or painted will be replaced without any charge to the Department in the same manner as it was installed or to the Department representative's specification. For Systems "A" and "B," only one system will be paid per steering compartments on this line.

17.4.1. **Prepare and Paint Rudder Compartments "System A."**

Prepare and paint entire rudder and steering compartments in accordance with Special Specification 7044, "Ferryboat Coating Systems," Section 7044.4.9., 'Rudder Compartments, Ballast and Ballast Tank, and Section 7044.5.9.1., 'System "A" – Spot Blast and Sweep.'

17.4.2. **Prepare and Paint Rudder Compartments "System B."**

Prepare and spot paint rudder and steering compartment in accordance with Special Specification 7044, "Ferryboat Coating Systems," Section 7044.4.9., 'Rudder Compartments, Ballast and Ballast Tank,' and Section 7044.4.9.2., 'System "B" – Mechanical Clean.'

Mechanical cleaning and spot coverage is not to exceed 50% of the steering compartments.

17.5. **Prepare and Paint Ballast Tank.**

Prepare and paint ballast tank. Remove or cover all equipment or items that the Department representative may deem critical. For Systems "A" or "B," only one system will be paid per ballast tank on this line.

17.5.1. **Prepare and Paint Ballast Tanks “System A.”**

Prepare and paint ballast tanks in accordance with Special Specification 7044, “Ferryboat Coating Systems,” Section 7044.4.9, ‘Rudder Compartments, Ballast and Ballast Tank,’ and Section 7044.4.9.1., ‘System “A” - Spot Blast and Sweep.’

17.5.2. **Prepare and Paint Ballast Tank “System B.”**

Prepare and paint ballast tanks in accordance with Special Specification 7044, “Ferryboat Coating Systems,” Section 7044.4.9., ‘Rudder Compartments, Ballast and Ballast Tank,’ and Section 7044.9.2., ‘System “B” - Mechanical Clean.’ Mechanical clean and spot coverage is not to exceed 50% of the compartment.

17.6. **Blast and Paint Barricade Gates.**

Blast and paint barricade gates and gate areas as follows:

- raise and secure the safety gate in place;
- remove the gate rams including hydraulic hoses;
- cap and seal off all hydraulic fittings and piping to prevent trash from entering the system;
- remove all grease fittings from gate hinge points and hydraulic ram hinge points and install plugs to prevent blasting media or paint from entering. The Department will provide replacement fittings for any of those found damaged;
- blast and paint hydraulic barricade rams on shore;
- remove and discard all trash from the ram well;
- prepare and paint the entire barricade gate and gate area from where the gate hinge meets the asphalt to the rub rail, including both sides of the gate;
- apply one full coat of zinc rich epoxy will be applied regardless of paint manufacturer recommendations;
- reinstall the rams and bleed air from the lines;
- check all lines and rams for leaks and proper operation; and
- reinstall grease fittings after painting is completed.

When lifting the gates manually, ensure that the control valve solenoid valve is operated to prevent damage from occurring to the rams. Verify solenoid valve is energized or operate manually at engine room hydraulic safety gate control location while this safety gate is being raised or lowered.

Prepare and coat all new and disturbed areas in accordance with Special Specification 7044, “Ferryboat Coating Systems,” Section 7044.4.11. ‘Barricade Gates and Gate Areas.’

Remove and reinstall barricade hydraulic rams will not be charged in conjunction with this Section unless the Department representative decides to replace rams.

This Item includes the work listed above but does not limit additional work needed.

17.7. **Prepare and Paint Exterior of Pilothouse.**

Prepare and paint exterior of pilothouse from bridge deck to include handrails and exhaust areas; to the top of the pilot house including but not limited to top of pilot house; all hand rails; and mast not to include bridge deck. This will be a separate item. Prepare and paint bulwarks including but not limited handrail and overhead areas, not to include car deck or the “A” deck floor. Remove and store all plugs, lights, junction boxes, speakers, horns, fire station boxes, and any equipment that the Department representative may deem critical. Cover or remove all tags, signs, valves, windows and trim, doors, seats, and glass. All wiring is to be covered or removed to ensure that there is no damage or allow paint to get on wire. Any wire or equipment deemed critical that is damaged or painted will be replaced without any charge to the Department in the same manner as it was installed or to the Engineer’s specification. For systems “A” and system “B,” only one system will be paid per vessel at the ship yard on this line.

17.7.1. **System “A” – Sand Sweep and Spot Blast.**

Prepare and paint exterior of pilothouse from bridge deck, to include hand rails exhaust areas to the top of the pilot house including but not limited to top of pilot house, all hand rails, and mast in accordance with Special Specification 7044, “Ferryboat Coating Systems,” Section 7044.4.10., ‘Exterior Steel Superstructure,’ and Section 7044.4.10.1., ‘System “A” – Sand, Sweep and Spot Blast.’

17.7.2. **System “B” – Sandblast to Near White Metal.**

Prepare and paint exterior of pilothouse from bridge deck, to include hand rails exhaust areas to the top of the pilot house including but not limited to top of pilot house, all hand rails, and mast, not to include bridge deck, in accordance with Special Specification 7044, “Ferryboat Coating Systems,” Section 7044.4.10., ‘Exterior Steel Superstructure,’ and Section 7044.4.10.2., ‘System “B” – Sandblast to Near White Metal.’

17.8. **Prepare and Paint Interior Deck Lockers.**

Prepare and paint interior deck houses. There will be four on the main car deck (two pedestrian life jacket lockers, a CO₂ locker and a deck locker). These will be from deck to top and to include all areas inside the lockers. All contents of locker will be removed and stored to ensure no paint or any equipment is damaged.

Surface preparation will be as follows:

- Remove any oil or grease with chemical cleaner;
- spot clean all rusted and abraded areas by use of power driven tools, electric or pneumatic, to bare metal; and
- blow all cleaned areas with high-pressure air to remove all dust, etc. (no spot cleaned surfaces should be left overnight without specified coating).

For Systems “A,” “B,” and “C,” only one system will be paid per vessel at the ship yard on this line.

17.8.1. **Prepare and Paint Interior Deck Lockers - System “A” - Sandblast to Near White Metal.**

Prepare and paint interior deck lockers in accordance with Special Specification 7044, “Ferryboat Coating Systems,” Sections 7044.4.8., ‘Interior Deck Lockers,’ and Section 7044.4.8.1., ‘System “A” - Sandblast to Near White Metal.’

17.8.2. **Prepare and Paint Interior Deck Lockers - System “B” - Mechanically Clean “Power Tools”.**

Prepare and paint interior deck lockers in accordance with Special Specification 7044, “Ferryboat Coating Systems,” Sections 7044.4.8., ‘Interior Deck Lockers,’ and Section 7044.4.8.2., ‘System “B” – Mechanically Clean “Power Tools.”’

17.8.3. **Prepare and Paint Interior Deck Lockers - System “C” - Mechanically Clean “Power Tools”.**

Prepare and paint interior deck lockers in accordance with Special Specification 7044, “Ferryboat Coating Systems,” Section 7044.4.8., ‘Interior Deck Lockers,’ and Section 7044.4.8.3., ‘System “C” – Mechanically Clean “Power Tools.”’

17.9. **Prepare and Paint Main Car Deck.**

Prepare and paint main car deck from barrier gate to barrier gate and all areas in between, including but not limited to pedestrian seating area, engine room access area, and all deck houses.

17.10. **System “C” – Non-Skid Epoxy System.**

Surface preparation for System “C” non-skid epoxy systems are as follows:

- take measurements of striping on main deck for reinstallation after coating;
- remove any oil or grease using a chemical cleaner;
- blast entire main deck, bulwark to bulwark, to SSPC Surface Preparation near White Metal Blast
- blow all blasted areas with high pressure air to remove all sand, dust, etc. (do not leave any blasted areas standing overnight without specified coating);
- protect all tire guards, bulwarks, and miscellaneous items on the main deck from sandblasting and coating;
- recoat any areas with overspray from sandblasting to paint specifications; and
- recoat the entire area if extreme overspray occurs.

Application of non-skid epoxy system is as follows:

- apply 1 coat of Zinc primer at 3 mils dry;
- apply 2 coats of epoxy at 5 mils dry per coat;
- apply topcoat of non-skid;
- profile will be designated by the Department representative at time of application; and
- reinstall striping using the measurements taken before blasting with the material specified by the Department representative. Prepare and paint main car deck in accordance with Special Specification 7044, "Ferryboat Coating Systems," Section 7044.4.14., 'Vehicle Deck,' and Section 7044.4.14.3., 'System "C" – Non-Skid Epoxy System.'

17.11. **Prepare and Paint "A" Deck.**

Prepare and paint "A" deck, the entire deck floor.

17.11.1. **System "C" – Non-Skid Epoxy System.**

Surface preparation for System "C" non-skid epoxy systems are as follows:

- Take measurements of striping on main deck for reinstallation after coating;
- remove any oil or grease using a chemical cleaner;
- blast entire main deck, bulwark to bulwark, to SSPC Surface Preparation near White Metal Blast
- blow all blasted areas with high pressure air to remove all sand, dust, etc. (do not leave any blasted areas standing overnight without specified coating);
- protect all tire guards, bulwarks, and miscellaneous items on the main deck from sandblasting and coating;
- recoat any areas with overspray from sandblasting to paint specifications;
- recoat the entire area if extreme overspray occurs.

Application of non-skid epoxy system is as follows:

- apply 1 coat of Zinc primer at 3 mil dry;
- apply 2 coats of epoxy at 5 mil dry per coat;
- apply topcoat of non-skid;
- profile will be designated by the Department representative at time of application; and
- reinstall striping using the measurements taken before blasting with the material specified by the Department representative. Prepare and paint main car deck in accordance with Special Specification 7044, "Ferryboat Coating Systems," Section 7044.4.14., 'Vehicle Deck,' and Section 7044.4.14.3., 'System "C" – Non-Skid Epoxy System.'

17.12. **Prepare and Paint Bridge Deck.**

Prepare and paint bridge deck, the entire deck floor outside pilot house.

17.12.1. **System “C” – Non-Skid Epoxy System.**

Surface preparation for System “C” non-skid epoxy systems are as follows:

- take measurements of striping on main deck for reinstallation after coating;
- remove any oil or grease using a chemical cleaner;
- blast entire main deck, bulwark to bulwark, to SSPC Surface Preparation near White Metal Blast;
- blow all blasted areas with high pressure air to remove all sand, dust, etc. (do not leave any blasted areas standing overnight without specified coating);
- protect all tire guards, bulwarks, and miscellaneous items on the main deck from sandblasting and coating;
- recoat any areas with overspray from sandblasting to paint specifications; and
- recoat the entire area if extreme overspray occurs.

Application of non-skid epoxy system is as follows:

- apply 1 coat of Zinc primer at 3 mil dry;
- apply 2 coats of epoxy at 5 mil dry per coat;
- apply topcoat of non-skid;
- profile will be designated by the Department representative at time of application; and
- reinstall striping using the measurements taken before blasting with the material specified by the Department representative. Prepare and paint main car deck in accordance with Special Specification 7044, “Ferryboat Coating Systems,” Section 7044.4.14., ‘Vehicle Deck,’ and Section 7044.4.14.3., ‘System “C” – Non-Skid Epoxy System.’

17.13. **Prepare and Paint Motor Room above Deck.**

Prepare and paint void or shaft alley ways above deck. All areas from engine bulkhead to ballast tank bulkhead, including but not limited to top of deck plates to the hull plate out to where the hull plate meets deck plate and all areas in between. There will be a non-skid area from deck plate to escape hatch, from rib to wall approximately 2 ft. wide and 15 ft. long. Cover or remove all tags, signs, valves, plugs, lights, glass and wire, or equipment deemed critical. All wiring is to be covered or removed to ensure that there is no damage or paint will get on wire. Any wire or equipment deemed critical that is damaged or painted will be replaced without any charge to the Engineer in the same manner as it was installed or to the Department representative’s specification. For systems “A” and system “B,” only one system will be paid per vessel at the ship yard on this line.

17.13.1. **Prepare and Paint Motor Room above Deck – System “A.”**

Prepare and paint Motor Room ways, above floor plate’s compartment, in accordance with Special Specification 7044, “Ferryboat Coating Systems,” Section 7044.4.12., ‘Above Deck Plates – Void or Shaft Alleyways Engine Room,’ and Section 7044.4.12.1, ‘System “A” – Spot Blast.’

17.13.2. **Prepare and Paint Motor Room above Deck – System “B.”**

Prepare and paint Motor Room, above floor plate compartment, in accordance with Special Specification 7044, “Ferryboat Coating Systems,” Section 7044.4.12., ‘Above Deck Plates – Void or Shaft Alleyways Engine Room,’ and Section 7044.4.12.2., ‘System “B” – Sandblast to Near White Metal.’

17.13.3. **Prepare and Paint Motor Room above Deck – System “C.”**

Prepare and paint Motor Room, above floor plate’s compartment, in accordance with Special Specification 7044, “Ferryboat Coating Systems,” Section 7044.4.12., ‘Above Deck Plates – Void or Shaft Alleyways Engine Room,’ and Section 7044.4.12.3., ‘System “C” – Mechanical Clean.’ Mechanical cleaning is not to exceed 50%. Apply paint to 100% of area.

17.13.4. **Prepare and paint Motor Room Above Deck–System “D.”**

Prepare and paint Motor Room, above floor plate compartment, in accordance with Special Specification 7044, “Ferryboat Coating Systems,” Section 7044.4.12., ‘Above Deck Plates – Void or Shaft Alleyways Engine Room,’ and Section 7044.4.12.4., ‘System “D” - Mechanical Clean with Modified Coating Requirements.’ Mechanical cleaned areas are not to exceed 50%.

17.13.5. **Prepare and Paint Motor Room below deck.**

Prepare and paint void or shaft alley ways below deck from the bottom of deck plates to the keel, from engine bulkhead to ballast tank bulkhead, including but not limited to area not covered by prepare and paint void or shaft alleyways above deck. Cover or remove all tags, signs, valves, plugs, lights, glass and wire, or equipment deemed critical. All wiring is to be covered or removed to ensure that there is no damage or paint that will get on wire. Any wire or equipment deemed critical, that is damaged or painted, will be replaced without any charge to Department in the same manner as it was installed or to the Department representative’s specification. For Systems “A,” “B,” “C,” and “D,” only one system will be paid per void or shaft compartment on this line.

17.13.6. **Prepare and Paint Motor Room below Deck –System “A.”**

Prepare and paint Motor Room and intermediate shaft below floor plate’s compartment, in accordance with Special Specification 7044, “Ferryboat Coating Systems,” Section 7044.4.13., ‘Below Deck Plates – Void or Shaft Alleyways and Engine Room,’ and Section 7044.4.13.1., ‘System “A” – Spot Blast.’ Spot blast not to exceed 50%. Apply paint to 100% of area.

17.13.7. **Prepare and Paint Motor Room below Deck –System “B.”**

Prepare and paint Motor Room and intermediate shaft below floor plate’s compartment, in accordance with Special Specification 7044, “Ferryboat Coating Systems,” Section 7044.4.13., ‘Below Deck Plates – Void or Shaft Alleyways and Engine Room,’ and Section 7044.4.13.2., ‘System “B” – Sandblast to Near White Metal.’

17.13.8. **Prepare and Paint Void or Shaft Alley Ways below Deck –System “C.”**

Prepare and paint Motor Room and intermediate shaft below floor plate’s compartment in accordance with Special Specification 7044, “Ferryboat Coating Systems,” Section 7044.4.13., ‘Below Deck Plates – Void or Shaft Alleyways and Engine Room,’ and Section 7044.4.13.3., ‘System “C” – Mechanical Clean.’ Mechanically clean, not to exceed 50%. Apply paint to 100% of area.

17.13.9. **Prepare and Paint Motor Room below Deck –System “D.”**

Prepare and paint Motor Room and intermediate shaft below floor plate’s compartment, in accordance with Special Specification 7044, “Ferryboat Coating Systems,” Section 7044.4.13., ‘Below Deck Plates – Void or Shaft Alleyways and Engine Room,’ and Section 7044.4.13.4., ‘System “D” – Mechanical Clean with Modified Coating Requirements.’ Mechanical cleaned area not to exceed 50%.

17.14. **Prepare and Paint Engine Room – Above Deck Plates.**

Cover and protect all machinery, equipment, glass, lights, speakers, alarms, engines, contacts, markings on piping and wire, or any equipment deemed critical from paint. Remove and properly dispose of all protective materials after painting. Any wire or equipment deemed critical that is damaged or painted will be replaced without any charge to the Department in the same manner as it was installed or to the Department representative’s specification. For Systems “C” and “D,” only one system will be paid per vessel at the ship yard on this line.

17.14.1. **Prepare and Paint Engine Room – Above Deck Plates – System “C.”**

In accordance with Special Specification 7044, "Ferryboat Coating Systems," Section 7044.4.12., 'Above Deck Plates – Void or Shaft Alleyways Engine Room,' and Section 7044.4.12.3., 'System "C" – Mechanical Clean.' Mechanically clean, not to exceed 50%. Apply paint to 100% of area.

17.14.2. **Prepare and Paint Engine Room Above Floor Plates – System "D" – Mechanical Clean.**

Prepare and spot paint no more than 50% of engine room, above deck plates, in accordance with Special Specification 7044, "Ferryboat Coating Systems," Section 7044.4.12., 'Above Deck Plates – Void or Shaft Alleyways Engine Room,' and Section 7044.4.12.4., 'System "D" – Mechanical Clean with Modified Coating Requirements.' Mechanical cleaned area not to exceed 50%.

17.15. **Prepare and Paint Engine Room – Below Deck Plates.**

Cover and protect all machinery, equipment, glass, lights, speakers, alarms, engines, contacts, markings on piping and wire, or any equipment deemed critical from paint. Remove and properly dispose of all protective materials after painting. Any wire or equipment deemed critical that is damaged or painted will be replaced without any charge to Department representative in the same manner as it was installed or to the Department representative's specification. For Systems "C" and "D," only one system will be paid per vessel at the ship yard on this line.

17.15.1. **Prepare and Paint Engine Room – Below Deck Plates – System "C."**

Cover and protect all machinery, equipment, glass, lights, speakers, alarms, engines, contacts, markings on piping, and other items needed to protect them from painting. Remove and properly dispose of all protective materials after painting. Prepare and paint entire engine room below deck plates, in accordance with Special Specification 7044, "Ferryboat Coating Systems," Section 7044.4.13., 'Below Deck Plates – Void or Shaft Alleyways and Engine Room,' and Section 7044.4.13.3., 'System "C" – Mechanical Clean.' Mechanical cleaned areas are not to exceed 50%.

17.15.2. **Prepare and Paint Engine Room below Floor Plates – System "D" Mechanical Cleaning.**

Prepare and spot paint no more than 50% of engine room compartment below deck plates, in accordance with Special Specification 7044, "Ferryboat Coating Systems," Section 7044.4.13., 'Below Deck Plates – Void or Shaft Alleyways and Engine Room,' and Section 7044.4.13.4., 'System "D" – Mechanical Clean with Modified Coating Requirements.' Cover and protect all machinery, equipment, glass, lights, speakers, alarms, engines, contacts, markings on piping, and other items needed to protect them from painting. Remove and properly dispose of all protective materials after painting is completed.

17.16. **Prepare and Paint Interior of Waste Oil Tank.**

Prepare and paint waste oil tank. Remove or cover all equipment or items that the Department representative may deem critical. For System "C" or "D," only one system will be paid per waste oil tank on this line.

17.16.1. **Prepare and Paint Interior of Waste Oil Tank System "C."**

Cover and protect all machinery, equipment, glass, lights, speakers, alarms, engines, contacts, markings on piping, and other items to protect them from painting. Remove and properly dispose of all protective materials after painting. Prepare and paint entire engine room below deck plates utilizing Special Specification 7044, "Ferryboat Coating Systems," Section 7044.4.13., 'Below Deck Plates – Void or Shaft Alleyways and Engine Room,' and Section 7044.4.13.3., 'System "C" – Mechanical Clean.' Mechanical cleaned areas are not to exceed 50%.

17.16.2. **Prepare and Paint Interior of Waste Oil Tank System "D."**

Prepare and spot paint no more than 50% of engine room compartment below deck plates, in accordance with Special Specification 7044, "Ferryboat Coating Systems," Section 7044.4.13., 'Below Deck Plates – Void

or Shaft Alleyways and Engine Room,' and Section 7044.4.13.4., 'System "D" – Mechanical Clean with Modified Coating Requirements.' Cover and protect all machinery, equipment, glass, lights, speakers, alarms, engines, contacts, markings on piping, and other items needed to protect them from painting. Remove and properly dispose of all protective materials after painting is completed.

17.17. Prepare and Paint Interior of Oily Water Tank.

Prepare and paint oily water tank. Remove or cover all equipment or items that the Department representative may deem critical. For System "C" or "D," only one system will be paid per oily water tank on this line.

17.17.1. Prepare and Paint Interior of Oily Water Tank System "C."

Cover and protect all machinery, equipment, glass, lights, speakers, alarms, engines, contacts, markings on piping, and other items to protect them from painting. Remove and properly dispose of all protective materials after painting. Prepare and paint entire engine room below deck plates utilizing Special Specification 7044, "Ferryboat Coating Systems," Section 7044.4.13., 'Below Deck Plates – Void or Shaft Alleyways and Engine Room,' and Section 7044.4.13.3., 'System "C" – Mechanical Clean.' Mechanical cleaned areas are not to exceed 50%.

17.17.2. Prepare and Paint Interior of Oily Water Tank System "D."

Prepare and spot paint no more than 50% of engine room compartment below deck plates, in accordance with Special Specification 7044, "Ferryboat Coating Systems," Section 7044.4.13., 'Below Deck Plates – Void or Shaft Alleyways and Engine Room,' and Section 7044.4.13.4., 'System "D" – Mechanical Clean with Modified Coating Requirements.' Cover and protect all machinery, equipment, glass, lights, speakers, alarms, engines, contacts, markings on piping, and other items needed to protect them.

18. CLEAN BRASS ITEMS

18.1. Clean Brass Items.

Contractor will remove all vent bells (approximately 16 vent bells per vessel), 1 vessel name plate, 1 wheelhouse bell and bracket, 2 wheelhouse air horns, 22 brass deck lights, 30 junction boxes, light switches, and plugs. Remove, clean, polish to brass, and apply clear silicon sealer to each brass item. Re-install items after all other painting operations have been completed using a sealing compound if necessary. Bolt on items using new stainless-steel hardware.

19. WOODEN NAME PLATE

19.1. Wooden Name Plate.

Remove both name plates. Clean, sand, re-stain, and apply paint to the original colors. Apply clear coat after all painting is complete and dry. Reinstall wooden name plate to the vessel after all work is complete.

20. MISCELLANEOUS ITEMS

20.1. Sign Work

Provide miscellaneous sign work, including any equipment and various items necessary to perform this work as directed. New signs will be placed in same location as signs removed. This item will include but is not limited to the following:

- removal of old signs,
- installation of new signs,
- design of any signs,

- material,
- machine work,
- computer work,
- parts and material to install, and
- disposal of all old parts.

Not to be used in conjunction with other Items of work requiring machine shop work.

20.2. **Repair or Fabricate Woodwork.**

Repair or fabricate woodwork as follows:

- remove all pilot house wooden trim cabinets and console;
- replace wooden frames with angel iron extending electrical wire, adding cooling fans same as the Michael W. Behrens; and
- this will consist of but not limited to removal of existing wood, disposal of all materials, steel welding rods, wire chain ladder, and various other items necessary to perform this work by the Department representative for approval.

20.3. **Welding and Fitting.**

Provide miscellaneous fitting and welding, including any equipment and various items necessary to perform this work, as directed. This Item includes, but is not limited to the following:

- burning,
- gouging,
- fitting, etc., and
- welding all type's.

Not to be used in conjunction with other Items of work.

20.4. **Machine Shop Work.**

Provide miscellaneous machine shop work, including any equipment and various items necessary to perform this work, as directed.

Provide all types of machine work and repairs that are normally performed by a machine shop such as the following:

- general machining;
- rebuilding, straightening, and machining;
- fabrication and machining; and
- bearing repair or replacement.

Not to be used in conjunction with other Items of work.

20.5. **Pipe Fitters.**

Provide miscellaneous work by pipe fitters, including any equipment and various items necessary to perform this work as directed.

This Item includes, but is not limited to the following:

- measuring pipe,
- removing pipe,
- threading pipe,

- cutting pipe,
- installing pipe, and
- fitting pipe.

Not to be used in conjunction with other Items of work.

20.6. **Electricians.**

Provide miscellaneous electrical work, including any equipment and various items necessary to perform this work as directed.

This Item will include but is not limited to the following:

- installing electrical fixtures,
- removing old wiring,
- running new wiring,
- disconnecting electrical equipment,
- connecting electrical equipment, and
- taking electrical readings.

Not to be used in conjunction with other Items of work requiring machine shop work.

20.7. **Overhead Crane.**

Provide overhead crane with operator, including any equipment and various items necessary to perform this work, to assist in loading or unloading materials and supplies from the ferry and moving materials from place to place as directed. This Item will be used when the Department needs a crane to assist them in completion of their repairs. Not to be used in conjunction with other Items of work.

20.8. **Welding.**

Weld cracks, pitting "clad weld," seams, etc. discovered after blasting and cleaning in accordance with ABS and USCG rules and procedures. Obtain approval from the Department representative before starting work. Not to be used in conjunction with other Items of work requiring welding.

20.9. **Mechanic.**

Provide mechanic to make necessary miscellaneous repairs to diesel engines including any equipment and various items necessary to perform this work as directed. Not to be used in conjunction with other Items of work requiring a mechanic.

20.10. **Dehumidifying Equipment.**

Provide dehumidifying equipment for use during the painting of compartments when weather conditions do not allow for normal drying and curing times.

20.11. **Marine Repair Mobilization.**

Move in and out expenses incurred when it is necessary to travel to make repairs. Travel distance will be limited to a maximum distance by the each for the round trip from the dry-docking location to the Port Aransas Ferry Headquarters. Provide vehicle and trailer if needed to transport Contractor, equipment, and materials to repair locations. Item will not be used to make repairs on vessel just returned from dry dock. The Department representative will approve this Item before being used. This Item will not be used for normal operations that require the pick-up and delivery of equipment, materials, parts, etc. as part of the dry-docking operation.

21. MEASUREMENT

An Item will be considered complete only when all the required materials and equipment have been installed and tested as per this Specification and approved by the Department representative.

21.1. Test and Inspect.

Test and inspection items will be measured as follows:

- inspect, repair, or replace overboard discharge valves and check valve by each vessel in dry dock;
- hydraulic steering system by each rudder steering system;
- hydraulic barrier gate system by each hydraulic barrier gate system; and
- test and recertify complete Co2 and fire alarm system by each vessel in dry dock.

21.2. Cleaning Items.

Cleaning items will be measured as follows:

- clean rudder compartment by the each;
- clean ballast tank by the each;
- clean motor room by the each;
- clean engine room above deck plates by the each;
- clean engine room below deck plates by the each;
- main motors and VFD's by each vessel in dry dock; and
- clean all drive cabinets and filters by each vessel in dry dock.

21.3. Remove and Reinstall.

Removal and reinstallation items will be measured as follows:

- remove and replace rub rail by the linear foot;
- removal of suction strainers by each vessel in dry dock;
- remove keel cooler by each vessel in dry dock;
- remove, clean, and reinstall sea valves by each vessel in dry dock;
- remove and reinstall underwater sea chest strainer by each vessel in dry dock;
- remove and reinstall anodes by each anode;
- repair or replace fuel shut off by the each;
- remove and replace plate on bulwarks and superstructure by the square foot;
- remove and replace plate on hull by the square foot;
- remove and reinstall tail shaft by the each;
- remove and reinstall aft and forward line shaft by the each;
- replace deck camera by the each;
- replace engine or rudder room camera by the each;
- replace camera wire by the linear foot;
- replace radio antenna wire by the linear foot;
- replace electrical wire 10-4 by the linear foot;
- replace electrical wire 12-4 by the linear foot;
- replace electrical wire 14-4 by the linear foot;
- remove lower rudder by the each;
- remove upper rudder by the each;
- replace batteries by each vessel in dry dock;
- remove and replace engine by the each;
- remove and replace generator by the each;
- remove and replace marine gear by the each;

- remove and replace drive motor by the each;
- remove and replace lights by the each;
- rebuild or replace diesel fire pump motor and skid by the each;
- rebuild or replace fire or bilge pump motor and skid by the each;
- remove and replace pilot house floor by the each;
- replace the pilot house air-conditioner by the each; and
- change all oil and filters by each vessel in dry dock.

21.4. **Piping.**

Piping items will be measured as follows:

- install or remove and replace 1/2 in. piping by the linear foot;
- install or remove and replace 3/4 in. piping by the linear foot;
- install or remove and replace 1 in. piping by the linear foot;
- install or remove and replace 1-1/2 in. piping by the linear foot;
- install or remove and replace 2 in. piping by the linear foot;
- install or remove and replace 2-1/2 in. piping by the linear foot; and
- install or remove and replace 3 in. piping by the linear foot.

21.5. **Steel Piping.**

Steel piping items will be measured as follows:

- install or remove and replace 1/2 in. piping by the linear foot;
- install or remove and replace 3/4 in. piping by the linear foot;
- install or remove and replace 1 in. piping by the linear foot;
- install or remove and replace 1-1/2 in. piping by the linear foot;
- install or remove and replace 2 in. piping by the linear foot;
- install or remove and replace 2-1/2 in. piping by the linear foot; and
- install or remove and replace 3 in. piping by the linear foot.

21.6. **Stainless Steel Piping.**

Stainless steel piping items will be measured as follows:

- install or remove and replace 1/2 in. piping by the linear foot;
- install or remove and replace 3/4 in. piping by the linear foot;
- install or remove and replace 1 in. piping by the linear foot;
- install or remove and replace 1-1/2 in. piping by the linear foot;
- install or remove and replace 2 in. piping by the linear foot;
- install or remove and replace 2-1/2 in. piping by the linear foot; and
- install or remove and replace 3 in. piping by the linear foot.

21.7. **Tubing.**

Tubing items will be measured as follows:

- install or remove and replace 1/4 in. tubing by the linear foot;
- install or remove and replace 1/2 in. tubing by the linear foot; and
- install or remove and replace 3/4 in. tubing by the linear foot.

21.8. **Valves.**

Valve items will be measured as follows:

- remove and replace 1/4 in. valves by the each;
- remove and replace 1/2 in. valves by the each;
- remove and replace 3/4 in. valves by the each;
- remove and replace 1 in. valves by the each;
- remove and replace 1-1/2 in. valves by the each;
- remove and replace 2 in. valves by the each;
- remove and replace 2-1/2" valves by the each; and
- remove and replace 3 in. valves by the each.

21.9. **Ductile Iron Valves.**

Ductile iron valves will be measured as follows:

- remove and replace 1-1/2 in. valves by the each;
- remove and replace 2 in. valves by the each;
- remove and replace 2-1/2 in. valves by the each; and
- remove and replace 3 in. valves by the each.

21.10. **Flat Bar.**

Flat bar items will be measured as follows:

- install or remove and replace flat bar 1 in. by 1/4 in. thick, by linear foot;
- install or remove and replace flat bar 3 in. by 1/4 in. thick, by linear foot;
- install or remove and replace flat bar 2 in. by 3/8 in. thick, by linear foot; and
- install or remove and replace flat bar 3 in. by 3/8 in. thick, by linear foot.

21.11. **Angle Iron.**

Angle iron items will be measured as follows:

- install or remove and replace angle iron 1 in. by 1 in. by 1/4 in. thick, by the linear foot;
- install or remove and replace angle iron 2 in. by 1 in. by 1/4 in. thick, by the linear foot;
- install or remove and replace angle iron 2 in. by 2 in. by 3/8 in. thick, by the linear foot; and
- install or remove and replace angle iron 3 in. by 3 in. by 3/8 in. thick, by the linear foot.

21.12. **Propulsion Items.**

Propulsion items will be measured as follows:

- remove and reinstall shaft brake by the each;
- refurbish cooper bearing by the each;
- replace cooper bearing by the each;
- remove and reinstall propeller by the each;
- dye test prop for cracks and check pitch of prop by the each;
- balance prop by the each;
- re-pitch prop by the each; and
- repair prop-welding of cracks by the each.

21.13. **Painting Items.**

Painting items will be measured as follows:

- prepare and paint hull water line down by the each;
- water line down – system "A" – water blast;
- water line down – system "B" – sand, sweep, and spotblast; and

- water line down – system “C” – sandblast to near white metal.

21.14. **Prepare and Paint Hull Water Line Up.**

Prepare and paint the following paint hull water line up items measured by the each:

- water line up to and including rub rail – system “A” – sand, sweep, and spot blast; and
- water line up to and including rub rail – system “B” – sandblast to near white metal.

21.15. **Prepare and Paint Bulwarks.**

Prepare and paint bulwarks utilizing the following items measured by the each:

- bulwarks and pilothouse – system “A” – sand, sweep, and spot blast; and
- bulwarks and pilothouse – system “B” – sandblast to near white metal.

21.16. **Prepare and Paint Steering Compartments.**

Prepare and paint steering compartments utilizing the following items measured by the each:

- “rudder compartments, ballast – system “A” – spot, blast, and sweep; and
- “rudder compartments, ballast – system “B” – mechanical clean.

21.17. **Prepare and Paint Ballast Tank.**

Prepare and paint ballast tanks utilizing the following items measured by the each:

- rudder compartments and ballast tanks – system “A” – spot, blast, and sweep; and
- rudder compartments and ballast and tanks – system “B” – mechanical clean.

21.18. **Blast and Paint Barricade Gates.**

Blast and paint barricade gates utilizing the “gate area” items measured by each gate area:

21.19. **Prepare and Paint Exterior of Pilothouse.**

Prepare and paint exterior of pilothouse compartments utilizing the following items measured by the each:

- system “A” – sand, sweep, and spot blast; and
- system “B” - sandblast to near white metal.

21.20. **Prepare and Paint Interior Deck Lockers.**

Prepare and paint interior deck lockers utilizing the following items measured by the each:

- interior prepare and paint interior deck lockers system “A” - sandblast to near white metal;
- interior prepare and paint interior deck lockers system “B” - mechanically clean power tools; and
- prepare and paint interior deck lockers – system “C” - mechanically clean power tools.

21.21. **Prepare and Paint Main Car Deck.**

Prepare and paint main car deck utilizing the vehicle deck system “C” – non-skid epoxy system item measured by each main car deck.

21.22. **Prepare and Paint “A” Deck. By the each.**

Prepare and paint "A" deck utilizing the vehicle deck system "C" – non-skid epoxy system Item measured by each deck.

21.23. **Prepare and Paint bridge deck.**

Prepare and paint bridge deck utilizing vehicle deck System "C" – non-skid epoxy system Item measured by each deck.

21.24. **Prepare and Paint Motor Room above Deck.**

Prepare and paint motor room above deck utilizing the following items measured by the each:

- motor room and engine room– system "A" – above deck plates – spot blast;
- motor room and engine room– above deck plates – system "B" – sandblast to near white metal; and
- motor room and engine room– above deck plates – system "C" – mechanical clean.

21.25. **Prepare and paint Motor Room below deck.**

Prepare and paint motor room below deck utilizing the following items measured by the each:

- "motor room and engine room– below deck plates – system "A" –spot blast;"
- "motor room and engine room– below deck plates– system "B" – sandblast to near white metal;"
- "motor room and engine room– below deck plates– system "C" – sandblast to near white metal." Mechanically clean not to exceed 50%. Apply paint to 100% of area; and
- "motor room and engine room– below deck plates – system "D" –mechanical clean." Mechanical cleaned area not to exceed 50%.

21.26. **Prepare and Paint Engine Room – Above Deck Plates.**

Prepare and paint engine room– above deck plates utilizing the following items measured by the each:

- "motor room and engine room– above deck plates – system "C" – mechanical clean." Mechanically clean not to exceed 50%. Apply paint to 100% of area; and
- "motor room and engine room– above deck plates – system "D" – mechanical clean." Mechanical cleaned area not to exceed 50%.

21.27. **Prepare and Paint Engine Room – Below Deck Plates.**

Prepare and paint engine room– below deck plates utilizing the following items measured by the each:

- "motor room and engine room– below deck plates – system "C" – mechanical clean." Mechanically clean not to exceed 50%. Apply paint to 100% of area; and
- "motor room and engine room– below deck plates – system "D" – mechanical clean." Mechanical cleaned areas are not to exceed 50%.

21.28. **Prepare and Paint Interior of Waste Oil Tank.**

Prepare and paint interior of waste oil tank utilizing the following items measured by the each:

- "motor room and engine room– below deck plates – system "C" – mechanical clean." Mechanically clean not to exceed 50%. Apply paint to 100% of area; and
- "motor room and engine room– below deck plates – system "D" – mechanical clean." Mechanical cleaned areas are not to exceed 50%.

21.29. **Prepare and Paint Interior of Oily Water Tank.**

Prepare and paint interior of oily water tank utilizing the following items measured by the each:

- “motor room and engine room– below deck plates – system “C” – mechanical clean.” Mechanically clean not to exceed 50%. Apply paint to 100% of area; and
- “motor room and engine room– below deck plates – system “D” – mechanical clean.” Mechanical cleaned areas are not to exceed 50% .

21.30. **Clean Brass Items**

The clean brass items will be measured by each vessel in dry dock.

21.31. **Wooden Name Plates By each vessel in dry dock.**

The wooden name plates item will be measured by each vessel in dry dock.

21.32. **Miscellaneous Items**

Hourly items are intended to cover the cost of work that was not anticipated when the Contract was prepared. The quantity of hours is an estimate of the hours for each applicable item and does not represent a minimum or maximum total of the hours that may be required. Report man hours accrued on any hourly bid item no later than one business day following the day the work was performed.

The following items are measured by the hour:

- sign work by the hour;
- repair or fabricate wood work by the hour;
- welding and fitting by the hour;
- machine shop work by the hour;
- pipe fitters by the hour;
- electricians by the hour;
- overhead crane by the hour;
- welding by the hour; and
- mechanic by the hour.

The dehumidifying equipment item is measured by the day for each day dehumidifying equipment is used.

The following items are measured by the each. Further details are as follows:

- marine repair mobilization by the each;
- dry docking by each vessel in dry dock;
- utility hook up by each vessel in dry dock;
- gas free certificate by each vessel in dry dock;
- Gantt chart by each vessel in dry dock;
- open rudder or steering compartments by each manhole opened;
- open ballast tanks by each manhole opened;
- open motor room escape hatch by each motor room escape hatch open;
- open motor room soft patch by each soft patch open;
- open fuel and clean tanks by each fuel tank open;
- open and clean oily water tank by each oily water tank opened;
- open and clean waste oil tank by each waste oil tank opened; and
- open air receivers by each air receiver inspected.

22. PAYMENT

The work performed, materials furnished, equipment, and incidentals provided will be paid for at the unit prices bid for the various items of work. The price will be full compensation for furnishing all material, unless otherwise shown on the plans and for all labor, tools, equipment, and incidentals.