

EXXON COMPANY, U.S.A.

POST OFFICE BOX 1512 • HOUSTON, TEXAS 77001 "STANSHIP HOUSTON"

MARINE DEPARTMENT

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MARINE ADVISOR

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MAINTENANCE & SERVICES MANAGER

Mr. G. Guy Via, Jr.
Newport News Shipbuilding
4101 Washington Avenue
Newport News, Virginia 23607

September 1, 1978

EXXON BOSTON
Shipyard Repairs

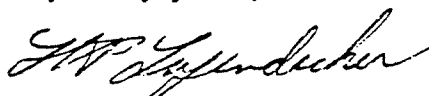
Dear Sir:

The EXXON BOSTON is nominated for repairs under the terms of our October 1, 1973 contract. The vessel should arrive in the yard on or about October 1, 1978. We will keep you advised of any changes to this schedule.

The work to be accomplished includes USCG Biennial Inspections, Four Year ABS Special Survey (hull), Drydocking, cargo tank coatings, steel renewals, miscellaneous other repairs and betterments which are described in detail in the attached specifications. We request your early preparation of the estimated material costs and man-hours for completing the work described in each item on these specifications. Please indicate the item(s) considered to be the controlling jobs, the amount of overtime necessary to expedite delivery by working overtime on the controlling jobs, and the amount of time which would be saved by authorizing overtime on this basis.

For purposes of Article IV of our contract, the forecast worth of the vessel is ATRS + 180% which equates to \$24,000 per day. Please indicate your agreement with the vessel's value by signing and returning one copy of the letter.

Very truly yours,



H. P. Leyendecker
Repair Superintendent

G. Guy Via, Jr.

HPL: bt
Attachment

c: Mr. H. J. Borgen w/attachments
Mr. W. N. Ekstrand w/attachments
Mr. R. E. Gordon w/o attachments
Mr. L. A. Hanft w/attachments
Mr. C. T. Stong w/attachments
Mr. J. A. Tompkins w/o attachments
Mr. E. J. Worrel, Jr. w/attachments

A DIVISION OF EXXON CORPORATION

EXX-MOR-010665

Unless otherwise specifically directed, the Contractor shall furnish the necessary labor, material, and/or equipment to complete the following items of work. It is understood that the Contractor will allow representatives of special equipment manufacturers to install or repair such equipment.

1 GAS FREE - 902

The Owner will steam, clean, and gas free or cause to be steamed, cleaned and gas-freed, all cargo tanks, cofferdams, pumproom, compartments and pipelines other than those containing bunker or boiler fuel and such other tanks, cofferdams, compartments, etc., as are specifically exempted by the Contractor's Certified Chemist. The Contractor shall not assume, however, that the vessel and/or its compartment and/or its pump and/or its piping is or are free from explosive or dangerous gas or gases or oil, but shall at his own expense have such tanks, compartments, pumps, piping, etc., tested by a Certified Chemist engaged by the Contractor who shall furnish the Owner and/or his Representative with a certificate showing that such compartments and/or pumps and/or piping, etc., have been so tested and found to be free from explosive and/or dangerous gas or gases or oil during the period of repairs and/or alterations. Delivery of such aforementioned certificate and receipt thereof by the Owner or his Representative shall in no way relieve and/or discharge the Contractor from his obligation to keep these places free from explosive and/or dangerous gas or gases or oil during the performance of this contract of any related additional work. Should, during the course of repairs or alterations, the Contractor's Chemist report the presence of dangerous and/or explosive gases or oil, the Contractor shall immediately stop all work and shall not resume work until such places, etc., are again certified free from explosive and/or dangerous gas or gases or oil.

Burning or other hot work shall not be done by the Contractor on any part of the cargo piping system, gas vent lines or other piping lines which may have contained oil, gas or other inflammable products, unless permission to do so is specifically granted by the Contractor's Certified Chemist.

No welding or burning will be allowed on cargo lines, in cargo tanks, in pumprooms, or on main deck while cargo lines are being tested.

2 SAFETY PRECAUTIONS - COATED MATERIALS - 905

The Contractor shall provide adequate exhaust ventilation; shall supply airline respirators, hose masks, or similar accessories; and shall take all other measures necessary to avoid creation of hazards resulting from burning or welding of coated plates, structural members, pipes, or other parts of the vessel or its equipment. The Contractor shall at no time run steam lines, air lines, water lines, acetylene lines, welding cables, light cables, or any other lines of any nature through the passageway doors or port holes to the quarters or engine room.

-----THESE PASSAGEWAYS ARE TO BE KEPT CLEAR AT ALL TIMES-----

3 TUG SERVICE - 905

Furnish necessary tug service to assist vessel from stream to pier, and from pier to drydock, from drydock to pier, and from pier to stream (if required).

4 LINE AND GANGWAYS - 905

Furnish necessary labor and crane service to handle lines and gangway upon vessel's arrival and departure.

5 FIREMAIN - 905

Furnish necessary material and labor to connect and disconnect firemain to vessel at pier.

6 SHORE POWER - 905

Furnish necessary labor and material to run piping and connect up and disconnect shore steam piping to the vessel. Supply shore steam to vessel during repair period.

7 WATCHMAN

Furnish services of watchman to maintain fire watch on vessel during period of repairs, also to survey vessel at least once each four hours during those periods when there is no shipyard work going on in machinery spaces or on deck, also tanks.

8 GARBAGE

Furnish containers watertight and necessary labor to dispose of garbage as necessary.

9 FRESH WATER, COOLING WATER FOR ICE MACHINE AND AIR CONDITIONING CONDENSERS
- 905

Furnish necessary labor and material to supply fresh water as required (wash and drinking). Also run hoses and connect up and disconnect hoses to the vessel for ice machine and air condition cooling water; supply water to vessel during repair period.

10 ENGINE ROOM BILGES - 905

Furnish labor and material for pumping out and disposal of engine room and shaft alley bilge water.

11 SCUPPER PLUGS AND STOCKING - 905

- a. Before any paint is applied to hull, install wood plugs with extensions pipes of sufficient lengths or other approved means in all scuppers and overboard drains throughout vessel to prevent any water running on hull of vessel. Plugs to remain in until painting is completed and dry and then removed.
- b. Install stockings on soil lines, scupper drains from washrooms and air conditioner, also ice machine overboard discharges, while vessel is on drydock to enable ship's personnel to use toilets and washrooms, preventing any water running on shell during painting.

12 DRYDOCK - 901

Vessel to be drydocked, keel blocks to be spaced at not less than three-foot centers, except in way of forward and after ends of dock pontoons in order to properly apply paint to keel between blocks. Contractor is to furnish water under pressure to painters for washing of vessel from keel to rail.

13 SLOP OIL DISPOSAL - 902

Contractor will be required to accept approximately 10,000 barrels of dirty slop from one (1) tank and dispose of same. Tank is to be gas freed by Contractor as required to obtain gas-free certificate, together with disconnecting pipelines and related pumps. There is to be no delay in accomplishing this item in order that repairs may proceed promptly upon vessel's arrival.

14 DOMESTIC WATER TANKS - 903 - DO NOT START UNTIL AUTHORIZED BY OWNER'S REPRESENTATIVE

Chip and scale all loose material from entire internal surfaces of four (4) fresh water tanks. Wooden plugs to be inserted in all suction and discharge connections prior to cleaning to prevent line from being clogged. Remove plugs prior to securing tank. Clean tanks and remove all debris from vessel. Apply one (1) spot coat cement wash to all bare areas and one (1) full coat for the entire internal area of both tanks. Flush out both tanks with fresh water. Chlorinate tanks, fill and dump tanks twice. Refill tank and leave tanks ready in all respects for human consumption as per USPHS requirements. Renew all disturbed manhole plate gaskets and replace all defective nuts and studs as required.

15 GENERAL ALARM TELEPHONES AND ENGINEER'S ALARM PANEL

Furnish necessary labor, material and equipment to check out and prove operational the general alarm system, telephone, and engineer's alarm panel. This is to include all alarms, lights, relays, wiring, etc.

16 ANCHOR CHAINS - 107

Range on dock, port and starboard anchor chains, for examination by USCG and ABS. Thoroughly clean chain lockers and remove dirt from vessel. Prove suction pipes clear. Sand sweep, coat with fish oil port and starboard anchor chains. Remark with paint and chain all patent links of chain as directed. Harden up on anchor shackle, crown pins and patent link pins. Reinstall and stow chains in lockers in good order. Free up and prove in good working order two (2) anchor chain swivels (one swivel each chain).

17 LIFEBOATS - 108

Remove all four boats from vessel to shop and allow for renewal of approximately 3 plates in each boat as found necessary. Remove all gear from four (4) lifeboats including air tanks and provision boxes for examination by USCG. Test, make necessary repairs and prove tight all air tanks. Scrape, wirebrush, remove all scale and loose paint. Apply one (1) coat of primer and one (1) coat of approved color paint to inner surfaces of boats. Paint and mark all gear and air tanks. Replace boxes, gear, etc. Free up and grease releasing gear. Apply a light coat of grease to internal surfaces of all boats before reinstalling floor boards. Bottom plating to be coated up to and including floor frames. Restow all gear and leave boats ready for use. Scrape and wirebrush all rusted areas on exterior surface of all boats, prime coat scaled areas and apply one full coat of white exterior paint. Restencil names on boats.

18 LIFEBOAT WEIGHT TEST - 108

Make necessary preparations as required and weight test all four (4) lifeboats and related equipment as per USCG requirements.

19 FOAM SAMPLE - 109

As soon as vessel arrives, draw two (2) samples of foam; one (1) from each foam tank. One (1) pint each. Box and ship same immediately addressed prepaid "Air Mail" to:

National Foam Company
Union and Adams Streets
West Chester, PA 19380

Mark carton "From SS EXXON BOSTON"

Send report to:

Exxon Company, U.S.A.
Marine Department
P. O. Box 1512
Houston, TX 77001

Attention: Herb Leyendecker

20 AUXILIARY CIRCULATING PUMP - SIZE 14 x 14 TYPE SDV - ALLIS CHALMERS - 211
DO NOT START UNTIL AUTHORIZED BY OWNER'S REPRESENTATIVE

Open up auxiliary circulating pump for examination and ABS survey. Disconnect and remove impeller assembly from casing; after survey, reinstall, renew casing gasket, repack, test and prove pump in good working condition. Replace removals in good order. One spare aux. circulator impeller is presently on board.

21 PROPELLER - 116 - DO NOT START UNTIL AUTHORIZED BY OWNER'S REPRESENTATIVE

Furnish necessary labor, equipment and material required to complete the following:

- a. Heat, fair and dress edges of all four propeller blades.
- b. Drill stopper holes at ends of all cracks, heat, braze and dress also in way of old repairs. Allow for repair of three (3) cracks.
- c. Upon completion of any repairs, polish entire propeller and hub to satisfaction of Owner's Representative.
- d. Prior to any paint application, coat wheel lightly with grease in order that paint does not adhere to wheel.

HULL PAINTING (Special Coating System 61-501)

GENERAL

- a. The entire exterior shell surface from turn of bilge to rail, oil and grease to be removed using Owner-supplied cleaner, and entire area; then wash down with fresh water under pressure. No. 8555 Exxon Chemical Company Cleaner.
- b. Before any paint is applied to hull, install wood plugs with extension pipes of sufficient lengths or other approved means in all scuppers and overboard drains throughout the vessel to prevent any water running on hull of vessel. Plugs to remain in until painting is completed and dry and then removed.
- c. Install stockings on soil lines, scupper drains from washrooms and air conditioner, also ice machine overboard discharges, while vessel is on drydock to enable ship's personnel to use toilets and washrooms, preventing any water running on shell during painting.
- d. Paint will be supplied by Owner.
- e. Paint may be sprayed on. Drying time allowed between each coat of paint to be in full accordance with manufacturer's recommendations. All surfaces are to be inspected and approved by Owner's Representative before applying priming coat and before applying each additional coat. All painting to be done only during clear and dry weather.

NOTE: Before starting abrasive sweeping or painting, cover transducer, hull anodes and reference cells. Upon completion, remove in good order.

KEEL TO LIGHT LOAD LINE

- a. Abrasive sweep entire bottom to light load line to remove all fouling, grass, rust and dirt.
- b. Apply one spot coat of RUST-BAN 6073 Aluminum Bituminous Bottom Composition (Light) to a thickness of 5 wet mils (2 mils dry).
- c. Apply one full coat of RUST-BAN 6074 Aluminum Bituminous Bottom Composition (Dark) to a thickness of 5 wet mils (2 mils dry).
- d. Apply one full coat of RUST-BAN 6073 Aluminum Bituminous Bottom Composition (Light) to a thickness of 5 wet mils (2 mils dry).
- e. Apply one full coat of RUST-BAN 6072 Super Tropical Antifoul to a thickness of 3 wet mils (1.5 mils dry).

LIGHT LOAD LINE TO DEEP LOAD LINE

- a. Abrasive blast to near white metal all rusty and bare areas including rusted weld seams, port and starboard (see below). Apply the following RUST-BAN paints.

HULL PAINTING (Continued)

- b. Apply one (1) coat RUST-BAN 193 Inorganic Zinc to a thickness of 4 mils dry to all blasted areas. Minimum recoat interval is 8 hours at 77° F and 50% relative humidity.
- c. All areas not covered by spot blasting in section (a) of Part 3 will be given an extra heavy abrasive sweep to remove all rust stains, loose and brittle coatings.
- d. Apply one (1) full coat RUST-BAN 6259 (6271 Gold) thermoplastic, one component epoxy, to a thickness of 8 wet mils (1.5 mils dry). Product may be thinned with TH 5859 up to one (1) pint per gallon as required. Minimum drying time before recoating is 4 hours at 77° F and 50% relative humidity.
- e. Apply one (1) full coat PU 5109 Boottop Red to a thickness of 6 wet mils (2.5 mils dry).
- f. Product PU 5109 uses TH 5861 for cleaning and reducing, as required.

DEEP LOAD LINE TO RAIL

- a. Abrasive to near white metal all rusty and bare areas including rusted weld seams, port and starboard. Apply the following RUST-BAN paints.
- b. Apply one (1) coat of RUST-BAN 193 Inorganic Zinc to a thickness of 4 mils dry to all blasted areas.
- c. All areas not covered by spot blasting in section (a) for Part 4 will be given an extra heavy abrasive sweep to remove all rust stains, loose and brittle coatings.
- d. Apply one (1) full coat RUST-BAN 6259 (6271 Gold) thermoplastic, one component epoxy, to a thickness of 8 wet mils (1.5 mils dry). Product may be thinned with TH 5859 up to one (1) pint per gallon as required. Minimum drying time before recoating is 4 hours at 77° F and 50% relative humidity.
- e. Apply one (1) full coat PU 5109 Boottop Red to a thickness of 6 wet mils (2.5 mils dry).
- f. Product PU 5109 uses TH 5861 for cleaning and reducing, as required.

HAILING PORT, VESSEL NAME, AND DRAFT MARKS

- a. Paint in above makrings using PU 5085 White.
- b. Product PU 5107 uses TH 5861 for cleaning and reducing, as required.

TAILSHAFT - 106 - DO NOT START UNTIL AUTHORIZED BY OWNER'S REPRESENTATIVE
(Quote separate item price for each part of item)

Furnish necessary labor, equipment and material to complete the following:

- a. Waukesha bearings and seals installed. Vessel's engineers to dispose of oil from system. Check centimeter gauge reading in presence of Owner's Representative. Make necessary removals, disconnect and remove section of line shafting. Remove aft seal sleeve bolts from propeller face. Install distance straps between sleeve and seal housing. Forward stern tube seal - remove bolts from sleeve to clamp ring, remove clamp ring, install distance straps. Remove propeller and draw tailshaft, clean tailshaft. Magnaflux shaft taper and in way of keeway and search for fractures in presence of USCG, ABS and Owner's Representative, stone and polish any scratches and burrs found on shaft, check bearings, cover shaft to protect same from damage. Disconnect and remove forward and aft stern tube sleeve assemblies to shop, dismantle for examination of seals, springs, sleeves, etc. Renew all defective parts furnished by Owner. Reassemble in good order, thoroughly clean all flange faces, renew defective gaskets and seal rings, replace renewing defective bolts and wire lacing, use monel wire for lacing bolts together.

Upon completion of examination, clean stern tube and drain tank. Reinstall tailshaft propeller, aft and forward seals, line shafting and connect up in good order. Fill propeller hub and fairwater with RUST BAN #324 by filling through ABC holes as directed by Owner's Representative. As soon as aft and forward seals are installed, fill stern tube system with new oil furnished by vessel. After 4 hours, remove drain plugs from seals and check for leaks, replace plugs. Take and record gauge reading. Fill aft and forward seals with oil furnished by vessel. Replace all removals in way of work in good order. Three (3) copies of all gauge readings taken to be given to Owner's Representative.

- b. While tailshaft is withdrawn, renew, with Owner-furnished spares, tailshaft bearings. This will require machining the O.D. and the I.D. of the new bearings to the proper dimensions. Three (3) copies of all stern tube dimensions and final machine size of new bearings to be given to Owner's Representative.
- c. All of the above work to be done under the supervision of a Waukesha serviceman. Cost of serviceman for Contractor's account.

CATHODIC HULL PROTECTION - 115 - DO NOT START UNTIL AUTHORIZED BY OWNER'S REPRESENTATIVE

Furnish necessary labor, equipment and material required to complete the following:

- a. Repair the following anode shields, a total of six (6). Spot sandblast defective areas of capastic shield to white metal, and sandsweep other areas, size 3' forward, 3' aft of ends of anode, and 3' above and 3' below anode and apply capastic to areas.
- b. Sandblast area outside of capastic shield by seven feet each way, and before capastic has cured, apply successive coats of Coal Tar Epoxy to area. Final thickness of Coal Tar Epoxy to be 20 mils. Coal Tar Epoxy furnished by Owner.

Forward Port and Starboard Shield - size of anode 4'

Size of capastic shield 10' x 6'

Size of Coal Tar Epoxy shield 24' x 20'

Forward Cofferdam Shield - size of anode 8' port and stbd.

Size of capastic shield 16' x 8'

Size of Coal Tar Epoxy shield 30' x 22'

Aft Cofferdam Shield - size of anode 4' port and stbd.

Size of capastic shield 10' x 6'

Size of Coal Tar Epoxy shield 24' x 20'

- c. Renew one (1) 8' anode (supplied by Owner).
- d. Renew one (1) 4' anode (supplied by Owner).
- e. All of above work to be done under the supervision of Englehard Industries serviceman. Cost of serviceman for Contractor's account. Upon completion of all repairs, serviceman to check out entire electrical system and prove in good working order.

Furnish necessary labor, equipment and material required to complete the following:

- a. Open up all sea valves in engine room, fire room, pumproom, and cofferdams, including bilge injection and all overboard discharge valves for examination by USCG and ABS. Machine seats and discs as found necessary, grind in, repack, renew bonnet gaskets, thoroughly clean and after inspection apply two (2) coats of Apexior #3 paint to all valve internal surfaces and close up valves in good order, renewing defective studs, bolts and nuts.

NOTE: Some sea valves are coated with neoprene. All damaged areas to be thoroughly scaled, wirebrushed, cleaned and apply neoprene to all bare areas. Open up all steam blowout valves to sea chests, machine seats and discs as found necessary, grind in, repack, renew bonnet gaskets, prove lines clear between blow out valves and sea chests, reassemble, renew defective studs, bolts and nuts. Prove tight.

1. Sanitary and sea water service 8" angle globe
2. Bilge pump overboard 4" gate
3. Ice machine overboard 2" gate
4. Air conditioner overboard 4" gate
5. Sanitary pump high sea suction 8" globe
6. Butterworth pump overboard 6" gate
7. Emergency fire pump suction 4" angle globe
8. Butterworth pump sea suction 8" angle globe
9. Emergency bilge suction shaft alley 12" angle stop check (bilge injection)
10. General Service pump overboard 5" gate
11. L.O. Cooler overboard 6" gate
12. Main circulating pump bilge injection 18" angle stop check
13. Auxiliary condenser overboard 12" gate
14. Forward fire pump suction 5" angle globe
15. Forward fire pump suction 5" angle globe
16. Contaminated oil drain overboard 1-1/2" globe
17. Evaporator overboard stop check 4"
18. Electric fire pump overboard 2-1/2" gate
19. Generator overboard 2-1/2" gate
20. Feed pump overboard 3" gate
21. Forward pump room 8" globe suction
22. Forward starboard cofferdam 10" globe overboard
23. Aft pump room port suction 10" globe
24. Aft pump room starboard sea suction 10" globe
25. After port cofferdam stripper discharge 8" globe
26. Main condenser high sea suction 24" butterfly
27. Main condenser low sea suction 26" butterfly
28. Main condenser overboard discharge 12" butterfly
29. Ballast pump suction 12" globe
30. Ballast pump overboard 10" gate
31. Ten (10) each 3/4" angle stops for steam outs

26 RUDDER - 105 - DO NOT START UNTIL AUTHORIZED BY OWNER'S REPRESENTATIVE

Furnish necessary labor, equipment and material required to complete the following:

- a. Carry out necessary work to obtain a Certified Chemist's gas-free certificate on rudder before starting any hot work. Remove inspection plates as necessary for examination of pintle nut and check pintle bushing clearances and submit to Owner's Representative. Check tightness of pintle nut and harden up as found necessary. Reinstall inspection plates as original - two (2) plates.
- b. Examine rudder and rudder horn for erosion and leaks. Vee out and weld up all leaks, if any. Pitted areas are to be sandblasted and coated with red hand cement prior to painting.
- c. Repack three (3) rudder stock glands using Owner-furnished packing as directed.
- d. All necessary staging to be included in above quotations.

27 MAIN CONDENSER - 231 - DO NOT START UNTIL AUTHORIZED BY OWNER'S REPRESENTATIVE

Furnish necessary labor, equipment and material required to complete the following:

- a. Open main condenser for examination. Wirebrush, scrape, and/or Hydro-blast and thoroughly clean water boxes, division plates, tube sheets and tubes. Test condenser to 15 lbs. hydrostatic pressure, plug all leaking tubes and prove tight. Remove all red hand and remaining neoprene from heads and division plates. Renew Swedish iron plates and any defective studs, nuts, gaskets and washers. Harden up on exhaust flange bolts. Shore up condenser for hydrostatic test. Upon completion of work, condenser is to be drained and shores removed. Close up in good order.
- b. Quote price per square foot to Vacu-Blast and coat with Owner-furnished epoxy-type protective coating (blasting and coating to be under the supervision of Owner-furnished service engineer) the interior of the return head, division plates and inlet head of main condenser. Include in quote setting up and dismantling equipment required to accomplish this.
- c. Set up and maintain necessary heat lamps and/or strip heaters in condenser water boxes required to bake out moisture in metal prior to coating.

NOTE: Extreme care to be taken when cleaning tube sheets in way of nylon tube inserts (ferrells) as they can be loosened, broken or damaged easily. Contractor will be held responsible for any damage to same.

SEA VALVES, CHESTS AND STRAINER - 125 - 126

Open up all sea valves in engine room, fire room, pumproom and cofferdams, including bilge injection, all steam blow-out valves, and overboard discharge valves for examination by USCG and ABS. Machine seats and discs as necessary, grind in, repack, rejoin and close up valves in good order. Clean out and prove steam blowout lines clear between valves and sea chests. While above valves are open, clean and coat with two (2) coats of Apexior #3. A total of approximately thirty (30) sea valves to be dealt with.

Furnish necessary labor and material, rig and remove staging as necessary to remove all sea strainers for examination of sea chests. Thoroughly scrape and wirebrush sea chests to bare metal and apply two (2) coats of Apexior #3 paint. Replace sea strainers and renew defective and missing lugs, bolts, studs, nuts and cotter pins.

SHIP SIDE CLAPPER VALVES - 126

Open up and overhaul all clapper valves in vessel's soil and drainage systems for examination by ABS. Build up by brazing wasted lugs on covers, renew wasted pins and renew four (4) clapper discs as designated. Scrape, wirebrush and clean internal surface of valves and apply two (2) coats of Apexior #3 paint to cleaned surfaces. Close up valves in good order, using new gaskets.

H.P. AND L.P. MAIN TURBINE FLEXIBLE COUPLINGS - 201 - DO NOT START UNTIL AUTHORIZED BY OWNER'S REPRESENTATIVE

Make necessary removals. Open up and remove for inspection two (2) high speed flexible couplings. Thoroughly clean couplings and check same for wear. Remove shoulders and wire edges by honing as directed. Remove and clean oil supply pipes and nozzles. Reassemble couplings, bearings, oil lines, nozzles and casings in good order. Renew neoprene rubber gaskets for upper and lower halves of H.P. and L.P. flexible coupling covers.

31 MAIN TURBINE AHEAD AND ASTERN THROTTLES - 206 - DO NOT START UNTIL AUTHORIZED BY OWNER'S REPRESENTATIVE

Open main turbine ahead and astern throttle valves. Renew Owner-furnished balance piston rings. Fit to recommended vertical height and gap clearance. Machine discs (as found necessary), grind and lap in and make tight. Hone and polish shoulders from cylinder. Check and set to correct clearance between disc and valve stem and renew spacer between disc and valve stem. Renew stainless steel fillister head locking screw, tack weld the screw to nut. Renew defective ball bearings in gear train bonnet assembly. Ream all holes true and make and install new pins and bushings in control valve linkages to remove all excessive slack. Reassemble with new gaskets, harden all nuts after throttle is hot. Replace or renew all disturbed insulation. After repair, the vessel is to be tied up sufficiently so that throttle valve can be tested out by running the main engine. While ahead throttle is disconnected, remove bonnet of oil governor assembly and renew bonnet gasket. Reassemble governor after renewal of gasket. "All of the above to be supervised by Newport News Service Engineer for Contractor's Account."

32 AUXILIARY CONDENSER - 230 - DO NOT START UNTIL AUTHORIZED BY OWNER'S REPRESENTATIVE

Remove heads, thoroughly clean and wirebrush heads, tube sheets, tubes and waterboxes. Apply one (1) coat of Apexior #3 to heads and waterboxes interiors. Renew Swedish iron plates and their securing studs, washers and nuts. Drain condenser, replace all removals and close up using new gaskets. Renew all defective studs, bolts and nuts and prove tight.

33 LUBE OIL COOLERS - MAIN SYSTEM - TWO (2) - 233 - DO NOT START UNTIL AUTHORIZED BY OWNER'S REPRESENTATIVE

Open up, remove both heads on lube oil coolers. Thoroughly wirebrush and air lance all tubes. Scrape, wirebrush, clean and apply one (1) coat of Apexior #3 to waterboxes and heads. Renew Swedish iron plates. Test, prove tight, and close up coolers in good order, renewing all gaskets, defective studs and nuts.

34 COMPRESSED AIR TANKS - USCG - 235 - DO NOT START UNTIL AUTHORIZED BY OWNER'S REPRESENTATIVE

Open up two (2) compressed air tanks for examination by USCG and ABS. Thoroughly clean, wirebrush surface and remove sediment. Upon completion, close up tanks in good order, renew gasket, defective studs and nuts. Test relief valves and prove in good order, overhauling as necessary.

35 DEAERATING TANK - USCG - 237 - DO NOT START UNTIL AUTHORIZED BY OWNER'S REPRESENTATIVE

Open up deaerating tank for examination and cleaning. Thoroughly wirebrush and clean all internal surfaces including dome. Remove all sediment and wash down inside of tank with fresh water. Test float for leaks and make tight, also free up and adjust all linkage for make-up valves and dump valves. Blow out and prove clear all air lines. Remove spray nozzle valve assemblies, overhauling as required or if necessary, renew valve nozzles (supplied by Owner). Reinstall assembly in good order. Machine seats and disc, grind in, test and prove tight two (2) relief valves on deaerating tank and set valves to lift at 55 lbs. pressure. Remove, clean, test, make tight and reinstall bent condenser. Upon completion of work and examination, close up in order using new gaskets. Renew all defective studs, nuts and bolts. Replace disturbed insulation in way of work.

36 INTERNAL CLEANING - MAIN BOILERS - 302 - DO NOT START UNTIL AUTHORIZED BY OWNER'S REPRESENTATIVE

Open up two (2) Babcock and Wilcox boilers for internal examination and cleaning, including steam and water drums, waterwall headers and superheater tube headers. Remove all handhole plates on each boiler for examination and cleaning boiler tubes and headers. Thoroughly wash out boilers with fresh water. Clean and remove all sludge and sediment from drums and tube headers. Renew all removed gaskets. Close up boilers with new gaskets on doors after boilers are steamed to 400 psi and plates have been hardened up. Replace all removals.

EXTERNAL CLEANING - MAIN BOILERS - 303 - DO NOT START UNTIL AUTHORIZED
BY OWNER'S REPRESENTATIVE

Scrape, wirebrush and thoroughly clean all external heating surfaces to two (2) Babcock and Wilcox boilers, including stack, uptakes, fan damper vanes, casing, air ducts, air heater tubes, economizer and generating tubes. Wash air heater, economizer and generating tubes with fresh water under high pressure and at approximately 150° F temperature.

Connect up hot wash water to soot blower header manifold and wash tubes utilizing rotating soot blower elements. Upon completion, reconnect as original all fittings in good order.

Upon completion of cleaning, remove all sludge and sediment from boilers and vessel and replace all boiler casing access doors renewing asbestos tape gaskets as necessary. Renew all missing or defective studs and bolts. Special attention to completely cover electric and mechanical equipment in shaft alley under boilers and in fireroom adjacent to boilers before washing is started.

NOTE: Upon completion of boiler washing and cleaning, neutralize tube surfaces with lime solution wash as soon as practical to neutralize sulphuric acid action on tubes. Mix a slake lime slurry solution to the consistency of thick paint. Apply by spray and thoroughly coat the tube surfaces.

38 BOILER BRICKWORK AND REFRACTORY - 304 - DO NOT START UNTIL AUTHORIZED BY
OWNER'S REPRESENTATIVE

Furnish necessary labor, equipment and material required to complete the following:

Part I - Remove all slag from floor of two (2) main boilers. Remove all loose kao-cast in way of tubes and renew.

Part II - Renew the following refractory:

- a) Front wall floor corbel, each boiler
- b) Side wall (two) floor corbel, each boiler
- c) Rear wall floor corbel, each boiler
- d) Burner areas mortar and superplastic, each boiler

Part III - Install oceanite pebbles (or equivalent) as directed on floors of each boiler. Prior to light-off, coat pebbles with sodium silicate mixture (binder).

Thermal Refractories Co. and/or A. P. Green Refractories Corp. materials to be used for all boiler brick and refractory requirements, Contractor-supplied, or equal quality will be considered to Owner's Representative approval.

BOILER SAFETY VALVES - 315 - DO NOT START UNTIL AUTHORIZED BY OWNER'S REPRESENTATIVE

Furnish necessary labor, equipment and material required to complete the following:

- a. Disconnect and remove two (2) superheater relief valves and four (4) safety valves from two (2) boilers. Valves are to be repaired by an approved safety valve service shop. Valves are to be thoroughly cleaned, including all working parts. Seats and discs machined as found necessary, ground in, defective parts including nozzles, etc., renewed. Test and prove valves steam tight at working pressure with proper relief and blow back pressures. Reinstall valves on boilers, renewing gaskets, defective studs and nuts. Test out valves and make all necessary adjustments after steam has been raised on boiler. Prove all in good order according to USCG and ABS requirements. Connect up lifting gear and replace all removals in good order. Cost of repair for Contractor's account.
- b. On vessel's arrival at yard and before plant is shut down, arrange for USCG and ABS inspectors' attendance to test all safety valves in place. Arrange for necessary labor to gag and make any required adjustments during the test.

40 SPILL VALVES ON VENT LINES - 408

Open up for inspection by USCG five (5) spill valves located on vent lines. Thoroughly clean, grind in and renew defective flame screens. Close up in good order. Renew all defective studs, nuts and capscrews.

41 #1 AND #2 AC GENERATORS AND EXCITERS - 801

Make necessary removals, and thoroughly wash out with approved solvent rotating fields and all winds in stators of generators and exciters. Bake dry until megger readings are satisfactory. Spray apply one (1) coat of Glyptol insulating varnish to all windings and coils. Check, rewire as necessary, and retape field and pole leads. Set up and turn true collector rings on main generators and commutators on exciters. Undercut mica as necessary. Refit Owner-supplied new brushes. Close up covers, test, check and prove units in good order. (See item #114).

42 MAIN AND EMERGENCY AND AIR CONDITIONING SWITCHBOARDS - 804

Thoroughly clean and blow out with dry air all busses, circuit breakers, terminal strips and insulators on main and emergency switchboards. Examine and tighten all connections, nuts and screws for terminals in front and behind switchboards. Check insulation of mountings for exciter rheostats, and renew as required. Work to be carried out when galley not in use. Examine and tighten all connections in all power control boxes to all auxiliaries. Prove in good order. Examine, check, test and adjust as necessary to prove in good order remote control switches and breakers on main switchboard for vent fan cut-outs, fuel oil pump cut-out, and forced draft fan cut-outs from body midship and after locations. Check out, adjust and repair as necessary all general alarm circuit bells. Check and adjust as necessary reverse power relays for main generators.

43 TEMPORARY HEATERS - 805

Install temporary type heaters or heat lamps on all motors, generators and converters that are not in use, also switchboards, and keep same in service during the entire repair period. Upon completion of repairs, remove all wiring and heaters.

44 MEGGER TEST READINGS - 809

Test and delivery to Owner's Representative as soon as practical after vessel's arrival in yard, four (4) typewritten copies of each set of megger readings of all generators, motors, controllers and electrical circuits throughout vessel. Locate and demonstrate to Owner's Representative section breakdown of all low readings found. Allow for removal of twenty (20) grounds from circuits as designated by Exxon Repair Inspector and/or Chief Engineer. Take megger readings of designated vital equipment just prior to light-off of plant.

45 PRESSURE VACUUM RELIEF VALVES AND VENT LINES - 408 - DO NOT START UNTIL
AUTHORIZED BY OWNER'S REPRESENTATIVE

Furnish necessary labor, equipment and material required to complete the following:

- a. Open up thirty-five (35) pressure vacuum relief valves for inspection in accordance with USCG and ABS requirements. Thoroughly clean, machine seats and discs as found necessary, grind in, and after inspection, close up in good order. Renew all defective screens, gaskets, and also defective or missing brass capscrews. Allow for machining twenty (20) discs.
- b. Allow for completely disconnecting and sending to shop three (3) of above valves for machining and overhaul. These would be valves that could not be repaired on vessel in place.
- c. Blow out all vent piping with compressed air and prove clear.

46 FLAME ARRESTORS - 408

Furnish necessary labor, equipment and material required to complete the following:

- a. Open up five (5) flame arrestors for cargo vent system, located on kingposts for inspection in accordance with USCG and ABS requirements. Flash, clean and free up all parts, grease runners with RUST-BAN #324.
- b. Renew five (5) defective screens in above items.
- c. Upon completion, reinstall and close up in good order.

47 PEABODY AUTOMATIC FIREMAN CONSOLES - 311 - DO NOT START UNTIL AUTHORIZED BY OWNER'S REPRESENTATIVE

Furnish necessary labor, equipment and material required to complete the following:

- a. Individually clean, dehydrate and keep dry three (3) console cabinets. Furnish and install protective covering during repair period.

48 SHELL GAUGING - ABS SURVEY - 103

Supply necessary labor, staging and equipment to take two (2) complete belts of audio gauge readings and readings on wind and water strakes all around port and stbd sides as required by ABS to complete hull survey. Supply Owner's Representative with five (5) copies of all readings taken.

49 REINFORCING PLATE #1 PORT DOUBLE BOTTOM TANK - 102 - DO NOT START UNTIL AUTHORIZED BY OWNER'S REPRESENTATIVE

Furnish necessary labor, material and equipment to thoroughly clean designated area of #1 port double bottom tank top just under evaporator air ejector condenser drain, port lower engine room. Install 3/8" x 18" x 18" reinforcing plate over area as directed. New material to be blasted and coated with RB 191 prior to installing. Repairs to be tested when this tank is pressed up for ABS surveyor on another item.

50 CONTROLLERS FOR TWO (2) FORCED DRAFT FAN MOTORS - 806 - DO NOT START UNTIL AUTHORIZED BY OWNER'S REPRESENTATIVE - Quote separate item price for each part of item

Furnish necessary labor, equipment and material required to complete the following:

- a. Open up drum switches, dress all contacts, clean and adjust and tighten connections, renew defective contacts, prove in good operating condition.
- b. Check out and clean resistor bank of both motors, check out controller of both motors, clean and polish all contracts, adjust, renew defective parts, check and tighten all connections. Test and prove in good working order.

51 3RD AND 4TH STAGE FEED WATERHEATERS - 207 - DO NOT START UNTIL AUTHORIZED BY OWNER'S REPRESENTATIVE - Quote separate item prices for each part of item

Furnish necessary labor, equipment and material required to complete the following:

- a. Arrange for services of field service engineer from approved chemical cleaning company to chemically clean in place two (2) feed water heaters (water side and steam side) with approved chemical. Include proper flushing and use of neutralizing agent. A portable pump and chemical container will be required to circulate and receive chemical respectively. A total of eight (8) valves must be removed to make the chemical connections.
- b. Open feed water heater heads of two (2) heaters for tube inspection. Close up using gaskets supplied by vessel.
- c. Remove section of steam return pipe from two (2) heaters and hydrotest shells at working pressure. Close up using new gaskets and renew nuts and bolts as required.

52 STORAGE SPECIFICATION - TAGGING VALVES AND MACHINERY PARTS - GENERAL INFORMATION

All valves and machinery parts removed from their respective locations and replaced with new or reconditioned valves or other machinery parts are to be tagged and secured in midship house square, noting service and location from which they were removed and specifying reason unless otherwise directed.

53 VALVE SPECIFICATIONS (GENERAL) - GENERAL INFORMATION

Pressure test all valves removed from place prior to opening up. All valves found tight required pressure to be repacked and replaced. Renew packing on all valves worked on. All valves to be replaced with new gaskets, bolts and nuts and proven tight. Replace and/or repair disturbed insulation.

54 VENT LINE PIPING SPECIFICATIONS - GENERAL INFORMATION

Furnish labor and material to crop and renew cargo vent piping with schedule 40 steel pipe. All pipe to be blasted and coated inside and out with RB 191. Renew all gaskets, bolts, and nuts and renew dresser couplings where necessary. Wirebrush and recoat with RB 188 all welds made after pipes are coated.

CARGO PIPING SPECIFICATIONS - GENERAL INFORMATION

Renew, test and prove tight the following cargo pipe and/or fittings. All new pipe and fittings to be sandblasted and coated with RB 191 internally and externally. Schedule 80 steel pipe is to be used for all new pipe below 6" and schedule 40 for 6" and above pipe diameter. Renew all gaskets, bolts and nuts. Blast and coat with RB 191 all new couplings. Wirebrush and recoat with RB 188 all welds made after pipes are coated.

CARGO PIPING REPAIRS - 407

Furnish necessary labor and material to make the following piping renewals as specified below. All piping to be blasted and coated with RB 191 prior to installation and all joints to have new gaskets, nuts and bolts. All new work to be tested and proven tight to Owner's Representative.

Stripping line in all tanks 8" Ø Schedule 80. Renewed line to be Scheduled 40 coated inside and out with Owner-approved coating.

PART I

- a. Crop and renew 6' section of stripping line bulkhead penetration between #3 center and #3 port tanks.
- b. Crop and renew 8' section of stripping line bulkhead penetration between #4 center and #4 starboard tanks. One flange and 90° bend.
- c. Crop and renew 6' section of stripping line on suction to #7 port tank between ballast line connection and 90° bend in #7 center tank.
- d. Crop and renew 8' section of stripping line bulkhead penetration between #9 center and #8 center tanks. One end flanged at connection to 8" Ø gate valve.
- e. Crop and renew 10' section of stripping line bulkhead penetration between #8 center and #8 starboard tanks. One flange and 90° bend.
- f. Crop and renew 18' section of stripping line in #8 center tank with one 45° offsticker 8' long with flange.
- g. Same as above but in #9 center.
- h. 10' section of stripping line bulkhead penetration between #9 center and #9 starboard tanks. One flange and 90° bend.
- i. Stripping line discharge of starboard stripping pump in main pump room one section 6" Ø double bend (2-45°) 14' long with one offsticker 8" long. 6" Ø three flanges.
- j. Crop and renew one section 8' long 6" Ø stripping line on deck forward of main pump room. One flange.

CARGO PIPING REPAIRS (Continued)

- k. Crop and renew one section 12' long 4" Ø stripping line from "C" line stbd side. One 45° and one 90° elbow, one flange.
- l. Crop and renew one section 6' long 4" Ø stripping line from "A" line stbd side. One 45° elbow and one flange.
- m. Crop and renew on deck one section 6" Ø 8' long with 90° elbow and flange of stripping line just forward of bulkhead penetration at after pump room.
- n. Crop and renew one section of 6" Ø 8' long with one flange on stripper line from starboard stripping pump in main pump room just below main deck.
- o. Crop and renew bulkhead penetration for starboard stripping pump at top of main pump room. 6" Ø 3' long with one flange.

PART II

Main cargo pipe in tank is 12" Ø Schedule 80 and to be replaced with Schedule 40.

- a. Crop and renew 16" Ø section of plate at bottom of drop line of "C" line in #8 center tank. Use 1/2" x 16" Ø plate.
- b. Crop and renew 16' section of 12" Ø line to #9 starboard from #9 center section has two (2) 45° elbows and one flange.
- c. Crop and renew one section 12" Ø 8' long of main suction line in #9 center at connection to main suction valve. One 90° elbow and one flange.
- d. Crop and renew one section 12" Ø 14' long of main suction line to #11 port from #11 center tank. Two 90° elbows.
- e. "A" line of discharge manifold midships. Crop and renew one section 5' long 16" Ø with 16" Ø to 12" Ø reducer. One flange 12" Ø.

PART III

Remove following cargo pipe in main pump room and repair as directed by Owner's Representative.

- a. Elbow reducer 20" Ø to 13-1/2" Ø between strainer box and suction side of "E" cargo pump. Elbow has one 8" Ø offsticker flange.
- b. One section 16" Ø spur piece between ballast line sea suction and "B" cargo line. Crop and renew about 6' long with one 90° elbow.
- c. Crop and renew one section 12" Ø line 10' long with 90° bend and two flanged between sea suction and stbd master valve on ballast crossover.

56 CARGO PIPING REPAIRS (Continued)

- d. Renew one section 16" Ø 7' long, with 4" Ø offsticker with flange, one 90° elbow, one 45° elbow and two flanges. This section of line is on discharge end of "A" main cargo pump.

57 MAIN CARGO PUMP - RELIEF VALVES - 401 - DO NOT START UNTIL AUTHORIZED BY OWNER'S REPRESENTATIVE

Furnish necessary labor, equipment and material to remove to shop relief valves of "C", "D" and "E" main cargo pumps. Thoroughly recondition, reassemble and repack. Relief valves to be set at 150 psi and tested in presence of Owner's Representative. Return to vessel and reinstall using new nut bolts and gaskets.

58 MOORING WINCH - 114 - DO NOT START UNTIL AUTHORIZED BY OWNER'S REPRESENTATIVE

Furnish necessary labor, equipment and material to remove shop complete clutch shaft of No. 2 mooring winch. Wire presently spooled on drum to be removed prior to disassembly of winch and respooled after winch reassembled. Build up by welding worn clutch dogs, machine to size. Return to vessel, reinstall and prove clutch in good working order under full load conditions.

59 INTERNAL DESUPERHEATER - 316 - DO NOT START UNTIL AUTHORIZED BY OWNER'S REPRESENTATIVE

While boiler drums are open for inspection, blank off internal desuperheaters and apply pressure to all internal pipes. Examine all welding on inlet and outlet connections. Repair defective welding as directed by Owner's Representative. Remove blanks on completion of test and renew gaskets.

60 WATERTIGHT DOOR - 120 - DO NOT START UNTIL AUTHORIZED BY OWNER'S REPRESENTATIVE

- a. Test all watertight doors in accordance with ABS requirements and prove tight. Total of 20 doors.
- b. Remove following doors ashore, heat and fair up doors and combings as necessary. Renew four wedges on frame and free up four securing handles. Renew gasket channel and gasket. Reinstall door and prove watertight.
 1. Watertight door forward portion midship house - port side main deck.
 2. Watertight door forward portion midship house - stbd side main deck.
 3. Watertight door to paint locker in forecastle.
 4. Watertight door to lamp locker in forecastle.
 5. Watertight door to forecastle port side.
 6. Watertight door to forecastle stbd side.

61 SALT WATER PIPING AND VALVES - 223 - DO NOT START UNTIL AUTHORIZED BY OWNER'S REPRESENTATIVE

Furnish necessary labor, equipment and material for the following.

- a. While vessel is in dry dock, remove existing 6" Ø gate valves of sanitary pump crossover (suction side) to main condenser and install Owner-supplied gate valves using new nuts, bolts and gaskets suitable for saltwater service. Valves are to be proved tight prior to installation in presence of Owner's Representative.

Furnish necessary labor equipment and material to crop and renew hand rails on ladders in the upper portion of the following tanks. Material to be used is 1" Ø bar stock or equivalent sand-blasted and coated with Owner-approved coating. Welded areas to be wirebrushed and coated as above.

- a. 12' in No. 2 Center.
- b. 12' in No. 2 Port.
- c. 20' in No. 3 Center.
- d. 16' in No. 4 Center.
- e. 12' in No. 5 Center.
- f. 12' in No. 5 Port.
- g. 8' in No. 8 Center.
- h. 12' in No. 9 Port.
- i. 16' in No. 9 Center.
- j. 16' in No. 11 Center.
- k. 6' in No. 10 Center.

ENGINE ROOM VALVES - 227 - DO NOT START UNTIL AUTHORIZED BY OWNER'S REPRESENTATIVE

Furnish necessary labor and equipment to disconnect and move from vessel to shop the following valves for repair. Open up valves and machine as necessary the seats, discs and stems. Close up using new gaskets and renewing any defective studs and nuts. Test and prove tight to Owner's Representative. Reinstall on vessel using new nuts, bolts and gaskets. Replace all disturbed insulation as original.

- a. 2-1/2" Ø 1500# steam valves (inlet) to main feed pumps, total of three (3).
- b. 1" Ø 900# inlet valve to 850#/150# reducing station for steam stripper.
- c. 2" Ø 900# inlet valve to 850#/150# reducing station for steam stripper.
- d. 2" Ø 900# bypass valve around steam stripper reducing station.
- e. 8" Ø 1500# main steam stop valve in engine room. Also machine disc stem pin guide and pin.
- f. 4" Ø 600# steam inlet valve to butterworth heater regulator.
- g. 4" Ø 600# steam inlet valve to butterworth heater regulator.
- h. 8" Ø 1500# superheater outlet valve stbd boiler.
- i. 8" Ø 1500# bulkhead steam stop valves in fire room, total of two (2).
- j. 6" Ø 150# atmos. exhaust vlvcs for main cargo pumps 1, 3, 4, 5.
- k. 4" Ø 300# steam inlet valve to 3rd stg. htr. (2).
- l. 4" Ø 300# steam inlet valve to 4th stg. htr. (1).
- m. 2-1/2" Ø 1500# steam stop valve on stbd boiler to stm tub generators.

64 FOAM SYSTEM - 109 - DO NOT START UNTIL AUTHORIZED BY OWNER'S REPRESENTATIVE

Furnish necessary labor, equipment and materials to accomplish the following work on foam line on main deck.

- a. Crop and renew one section 14' long 4" Ø one 90°, two 45° elbow, two flanges. First section aft of midship house.
- b. Remove to shore, four expansion joints 6" Ø (one on foam line forward of midship house, three aft of midship house) disassemble, sand blast and coat with Owner-supplied coating; free up, machining if necessary, and repack and reinstall using new nuts, bolts, and gaskets suitable for salt water service. Prove tight under full working pressure 150 psi to satisfaction of Owner's Representative.

65 DECK EXHAUST LINE - 117 - DO NOT START UNTIL AUTHORIZED BY OWNER'S REPRESENTATIVE

Crop and renew deck exhaust line bulkhead penetrations in the following locations. Material required in each location is 10' long 8" Ø Schedule 80 steel pipe with two flanges (150#).

- a. Forecastle bulkhead penetration.
- b. Midship house forward bulkhead penetration.
- c. Midship house aft bulkhead penetration.
- d. Main pump room bulkhead penetration.

Install new sections using new nuts, bolts and gaskets suitable for high temperatures and exposure to salt water. All renew sections to have exterior coated with heat resistant paint. All insulation to be renewed as necessary and protective covering installed as directed by Owner's Representative.

66 DOUBLE BOTTOM TANKS - NOS. 1 AND 2 (PORT AND STBD) - DO NOT START UNTIL AUTHORIZED BY OWNER'S REPRESENTATIVE - 102

Furnish necessary labor, equipment and material to thoroughly clean double bottom tanks of all scale, sludge, oil and mud. Tanks to be hydro tested to locate leaks. Leaking areas to be marked with white or yellow paint and repaired by installing doublers as directed by Owner's Representative. On completion of repairs, tanks to be proved tight to satisfaction of Owner's Representative and refilled with fresh water.

Supply labor, equipment and material to renew various pipe hangers on cat walk "A" frames as listed below. All hangers to be lead-lined after sand blasting and coating with Owner-approved coating. All welds to be wire-brushed and coated. Various portions of "A" frame piping supports to be renewed as indicated below and these renewed sections to be sand blasted and coated with Owner-approved coating. Cable tray to be cropped and renewed as indicated below, all material renewed in cable tray to be blasted and coated.

- a. #2 "A" frame - Renew hangers (8" Ø) of fire line and exhaust steam line. Foam line 2 hangers 4" Ø.
- b. #3 "A" frame - Renew foam line hanger 4" Ø, fire and exhaust steam line 8" Ø.
- c. #4 "A" Frame - Renew cargo vent line, hanger on 8" Ø fire line, steam exhaust line 8" Ø, expansion trunk on cable tray, expansion joint on cat walk.
- d. #5 "A" Frame - Renew hanger fire line 8", foam 6".
- e. #7 "A" Frame - Renew pipe hanger support girder in way of expansion joint, on deck exhaust line 3/8" T 12" L 7" H - 4" W.
- f. #9 "A" Frame - Renew expansion plates and bolts on cat walk, cable trunk expansion joints.
- g. #11 "A" Frame - Weld existing hanger to girder support between fire and steam exhaust line.
- h. #12 "A" Frame - Weld existing hanger to girder support for bottom wash butterworth machines.
- i. #13 "A" Frame - Renew hanger for fire and exhaust line.
- j. #14 - Renew hanger on 8" Ø fire line and exhaust line.
- k. #15 "A" Frame - Weld hanger on 6' foam line and deck steam line 6" Ø.
- l. #16 "A" Frame - Weld extension on support girder 6" and weld deck steam line hanger to same.
- m. #17 "A" Frame - Weld hanger on deck steam line.
- n. #18 "A" Frame - Renew foam line hanger 6" Ø. Renew girder support same as #16.
- o. #19 "A" Frame - Renew hanger on 6" Ø foam line. Install support on 2-1/2" Ø steam line to cargowinch. Support to be connected to "A" frame.
- p. #20 "A" Frame - Renew girder support in way of fire line expansion joint 3/8" T x 4" W x 36" L x 12" H.

CAT WALK (Continued) - 128

- q. #21 "A" Frame - Same as above except renew steam exhaust line expansion support, connect to girder support. Do starboard side same but no expansion support.
- r. #22 "A" Frame - Weld deck steam hanger.
- s. #23 "A" Frame - Renew support girder in way of fixed butterworth. Line hanger and renew hanger 2-1/2" Ø.
- t. #24 "A" Frame - Renew fixed butterworth hanger.
- u. #25 "A" Frame - Renew exhaust steam line hanger 8" Ø.
- v. #26 "A" Frame - Renew hanger on 2-1/2 fix butterworth line. Renew expansion plate and bolts on cat walk and expansion trunk of cable tray. Install angle iron 3/8" T x 4" x 4" x 6' long as directed on support girder. Crop and renew upper support girder 3/8" T x 4" W x 7" H x 5' L.
- w. #27 "A" Frame - Renew support girder same as #7 "A" frame. Upper support girder same as #26 "A" frame.
- x. #28 "A" Frame - Weld foam line hanger to girder support, weld fire line hanger.
- y. #29 "A" Frame - Install hanger on 6" Ø steam line, weld hanger on fire line.
- z. #30 "A" Frame - Install hanger on 8" Ø fire line. 6" Ø steam line install hanger.
- aa. Crop and renew vent line support between #26 and #27 "A" frames. 2 - 3/8" T 3" x 3" x 14', install hangers for 10" Ø vent line, total of four (4).
- bb. Remove cargo vent line dresser coupling in way of #26 "A" frame and #27 "A" frame. Reinstall new Owner-supplied vent line and dresser coupling with new bolts, nuts and gaskets. Bolts and nuts to be stainless steel or cadmium plated.

VENTILATING SYSTEM - 703 - DO NOT START UNTIL AUTHORIZED BY OWNER'S REPRESENTATIVE

Crop and renew approximately 16' with two bends 16" x 30" ventilation duct to quarters. Ducting located over starboard boiler. Insulation to be renewed as required. Material of ducting to be galvanized sheet metal.

69 EXPANSION TRUNK ULLAGE PIPES - 501 - DO NOT START UNTIL AUTHORIZED BY
OWNER'S REPRESENTATIVE - Quote separate item prices for each part of item

Furnish necessary labor, equipment and material required to complete the following:

- a. Fabricate nine (9) ullage trunks. These are to be made in such a way as to accommodate 6-3/4" dia. flame screens in accordance with USCG requirements. Blast and coat new trunks with RB 191 prior to installation on designated expansion trunks.
- b. Crop out and install new ullage trunks (9) in designated locations on deck. Hose test all welds and prove tight to all parties concerned.
- c. Remove old covers and yokes from existing trunks and install same on new installations. Renew any defective hinge pins (3/4" dia.)
- d. Renew nine (9) cover gaskets (1/2' x 1/2" x 6" dia.) in ullage trunk covers as directed. Prior to installing new gasket material, needle gun gasket channels and coat with RB 193.
- e. Renew expansion trunk gasket material (neoprene) in twenty-two (22) designated locations. Will require 1-1/2" x 1-1/2" x 154" of gasket material for each one. Prior to installing new gasket material, needle gun gasket channels and coat with RB 193.

70 PORT BUNKER OIL SETTLING TANK - DO NOT START UNTIL AUTHORIZED BY OWNER'S REPRESENTATIVE - 226

Furnish necessary labor, equipment and material to clean and gas free the port bunker oil settling tank to condition safe for men and fire. After obtaining gas-free certificate, crop and renew 18' section of 6" Ø vent line from port bunker oil settling tank. Vent line penetrates port side of main pump room at main deck level. Section to be renewed has four 90° elbows and one flange. Vent line material to be Schedule 40 steel pipe coated inside and out with Owner-approved coating.

71 FRESH WATER PIPING AND VALVES - 225 - DO NOT START UNTIL AUTHORIZED BY
OWNER'S REPRESENTATIVE

Furnish labor, equipment and materials necessary to renew one section of 1-1/2" Ø 15' long drinking water filling with two (2) flanges located aft of midship house under cat walk. Use galvanized Schedule 80 pipe.

72 FEEDWATER SYSTEM PIPING AND VALVES - 228 - DO NOT START UNTIL AUTHORIZED BY OWNER'S REPRESENTATIVE

Fabricate and install two (2) temperature bulb wells in outlet of third and fourth stage feed water heaters (one well in each outlet) as directed. Nipple in place to receive temperature bulb well is 1" Ø. Bulb well is to be suitable for 900 psi service.

73 CARGO HEATING SYSTEM - 409 - DO NOT START UNTIL AUTHORIZED BY OWNER'S REPRESENTATIVE

Crop out bulkhead penetration in upper main pump room (main deck level) of steam line to cargo heating coils and install insert by welding. Material required 1/2" thick x 7" Ø. Area of insert to be wirebrushed and coated with Owner-approved coating. On completion of repairs, area around and in way of insert to be proved watertight to satisfaction of Owner's Representative.

74 VENTILATING SYSTEM - 703 - DO NOT START UNTIL AUTHORIZED BY OWNER'S REPRESENTATIVE

Furnish labor, equipment and materials necessary to repair as directed the ventilators listed below. All screening in ventilators to be renewed. Required material - sheet metal approximately 80 sq. ft; screening, 45 sq. ft.

- a. Ventilator on port boat deck supplying air to midship passage (poop deck level).
- b. Ventilator on stbd boat deck supplying air to midship passage (poop deck level).
- c. Ventilator on flying bridge supplying air to battery room.
- d. Ventilators (2) on flying bridge supplying air to midship air conditioning blower room.

NOTE: All material should be suitable for service in salt water atmosphere.

MOORING WINCHES - 114 - DO NOT START UNTIL AUTHORIZED BY OWNER'S REPRESENTATIVE

Furnish labor, equipment and materials necessary to sand blast and coat basic framework of mooring winches, total of twelve (12). Excessively wasted portions of winch frame work to be cropped out and insert welded as indicated below prior to application of Owner-approved coating. Welds to be wirebrushed prior application of this coating also. Fabricate and install a total of forty (40) 1" Ø pipe supports on cylinder drain line on mooring winches as directed. Crop out and install Owner-supplied expansion bellows on the winches indicated below using new nuts, bolts and gaskets as required. Crop and renew combings around winches as directed. Allow for 3/8" x 3" x 200' of material.

- a. No. 3 winch (forecastle deck) - Renew expansion bellow on steam supply line - 3-1/2" Ø.
- b. No. 4 winch (forecastle deck) - Renew expansion bellows on steam (3-1/2" Ø) and exhaust (5" Ø) lines.
- c. Fabricate and install on No. 6 winch one (1) pipe support lead-lined on 5" Ø steam exhaust line and one (1) pipe support lead-lined on 3-1/2" Ø steam supply line.
- d. No. 7 winch - Crop and install insert in frame support on forward cylinder, allow for 3/8" thick plates, 8" x 12" and 12" x 18" (triangular shape). Fabricate and install one (1) pipe support lead-lined on 3-1/2" Ø steam supply line to winch as directed.
- e. No. 8 winch - Fabricate and install one (1) pipe support lead-lined on steam supply line 3-1/2" Ø.
- f. No. 9 winch (poop deck) - Crop out and install one expansion bellows on 5" Ø exhaust line with one 90° elbow (Schedule 80).
- g. No. 10 winch (poop deck) - Crop out and install expansion bellows on 5" Ø exhaust line with one 90° elbow and line 5' long 5" Ø with two flanges (line to be Schedule 80 steel pipe).

ANCHOR WINDLASS - 113 - DO NOT START UNTIL AUTHORIZED BY OWNER'S REPRESENTATIVE

Furnish labor, equipment and material to sand blast and coat basic framework of anchor windlass. Crop out and renew combing 3/8" x 3" x 30' around anchor windlass as directed by Owner's Representative prior to application of approved coating to basic framework of anchor windlass.

SUPERHEATER TUBES - 307 - DO NOT START UNTIL AUTHORIZED BY OWNER'S REPRESENTATIVE

Furnish labor, equipment and material necessary to crop out and renew a total of 12 tubes in the superheater of the port boiler (seven are in second pass). The Contractor will be required to make all necessary removals and replacements to complete the above work. The Exxon Boston boilers are Babcock-Wilcox "D" type fitted with walk-in type superheaters accessible from the front or firing side.

(57) T-11 tubes 1st pass (lower) 1-1/4" x .135 thick
(66) T-12 tubes 2nd pass (middle) 1-1/4" x .134 thick
(48) T-13 tubes 3rd pass (top) 1-1/4" x .134 thick
171 tubes total for each boiler

On completion of repairs, boilers are to be closed up and left in all respects ready for steaming. All debris resulting from these renewals are to be cleaned up and removed from vessel. It will be necessary to remove approximately ten (10) welded plugs in each boiler.

On this item, it will be necessary to crop out the old tubes and machine out all seal welds prior to driving out old ferrule end. All header holes are to be carefully examined for damage and any found damaged are to be built up by welding and machined to original dimensions prior to renewal of tubes. All tube ends are to be polished prior to installation. All tube ends are to protrude through the header approximately 3/16", but not less than 1/8" in order to have proper clearance to bell tube ends and leave sufficient area to seal weld tubes to inside of header. All welding to be in accordance to manufacturer's recommendations and USCG regulations. All tube ends at headers found out of round are to be redone, rolled, machined, welded and properly rounded out. Care to be exercised that tubes not be over-rolled on completion, the hydrostatic test to be held on boiler sufficient time so that inspector may assure himself that the repairs are properly tight.

It will be necessary for the contractor to make all preparations and carry out all work to prove renewals in good order. It will be necessary to remove refractory and superheater protection plates. All refractory and head protection plates are to be installed as original. All superheater supports to be installed as original and damaged or removed insulation to be renewed as per manufacturer's Drawing #5760 E-3. See welding schedule (original) held in main boiler prints aboard vessel for weldments and superheater header tube.

78

BOILER AIR HEATER TUBE RENEWALS - 308 - DO NOT START UNTIL AUTHORIZED BY OWNER'S REPRESENTATIVE.

Remove and renew all lower banks of air heater tubes in both main boilers.

Accept Owner's supplied 2" air heater tubes "Corten", total of 594. Clean all ends of tubes prior to installing.

Make necessary removals and replacements to install aforementioned tubes, including two (2) damper doors to each boiler. After completion of tube renewal, replace doors as original, test opening and closing operations in presence of the Chief Engineer before removing and after replacing. Requires removing and replacing both door frames as found necessary.

Make sure all tubes extend out the same length from the inlet tube sheet, so that the insulating material can be applied the same uniform thickness on the entire inlet end.

79

RADAR MAST YARD ARM - 130 - DO NOT START UNTIL AUTHORIZED BY OWNER'S REPRESENTATIVE.

Furnish labor, material and equipment necessary to crop off and renew radar mast yard arm and first ladder grab iron at platform on yard arm. Material required is approximately 30 feet 3" Ø pipe, 30 feet of 2" Ø pipe and 15' of 1" Ø solid stock. Prior installing yard arm assembly sand blast and coat assembly with owner approved coating. After installing yard arm welds to be wire brushed and coated. Pad eyes to be installed on bottom of yard arm for securing flag hoists to (total of 6).

80

FORWARD PUMPROOM LADDERS AND LANDINGS - 128 - DO NOT START UNTIL AUTHORIZED BY OWNER'S REPRESENTATIVE

Furnish labor, material and equipment necessary to crop out and renew rungs of first and second ladders going down to forward pumproom. Landing between these two ladders is also to be renewed. Material required: 87 feet of 3/4" square solid stock for ladders, 46 feet of 3/4" square solid stock for landing, 12 feet of 2" x 1/4" thick angle iron for landing frame. All above to be wire brushed and primed.

81 CARGO AND BALLAST PIPING - 407 - DO NOT START UNTIL AUTHORIZED BY OWNER'S REPRESENTATIVE

Furnish labor, equipment and material necessary to crop off and renew pipe supports on main cargo line (16" O). It will be necessary to reposition cargo lines and realign dresser couplings on the cargo line prior to installing the new pipe supports. All material for pipe supports to be sand blasted and coated with owner approved coating prior their installation and installation welded areas to be wire brushed and coated. Material required:

2" angle iron 1/4" thick approximately 100 feet long. This to be connected to existing cargo pipe support saddles as directed by Owner's Representative in the following cargo tanks.

- A) No. 8 center
- B) No. 9 center
- C) No. 10 center
- D) No. 11 center

82 DECK STEAM LINE INSULATION - 117 - DO NOT START UNTIL AUTHORIZED BY OWNER'S REPRESENTATIVE.

Deck steam line insulation to consist of carey temp section (now Asbestos) covering with 1/2" mesh galvanized hardware cloth. A covering of insulating cement (hylo or equal) to be trowelled over the hardware cloth. The insulation is then to be further protected by covering with heavy glass cloth. The entire glass cloth is to be thoroughly coated with Vimasco #WC-1 gray weather proof cement.

- a. Furnish labor, material and equipment necessary to install in designated areas approximately 800 square feet of slot welded steel plate 3/8" thick. Entire Fidley deck to be sand blasted to remove all scale and rust prior installation of plate. Upon completion of installation of slot welded steel plate as directed all welds to be sand blasted and coated as stated in Part "C" of this item.
- b. Allow for renewal of designated area of approximately 150 square feet of deck between inner and outer stack at stack deck level. Prime and coat new areas as directed.
- c. Aft boat and stack decks are to be sand blasted to near white metal (SS SA2-1/2). Apply one (1) coat of Owner-furnished Joton Balto Flake or equal to 25-30 MDFT. Prior to cure, spread spent grit into coating to act as antiskid. Application to be in accordance with manufacturer's recommendations and to satisfaction of manufacturer's representative. Applications to be done in such a time that it will not interfere with other repairs.

84 GALLEY CONVERSION - BETTERMENT NO. 8
PART I

A. MATERIAL PROCUREMENT

Provide manpower and material to accomplish refurbishment (Betterment) of the ship's galley and Officers' and Crew's Mess in accordance with Jacksonville Shipyards drawings and Owner's instructions.

Time and material charges are to be made to proper items as noted below:

Procure all contractor-furnished material required to accomplish refurbishment modifications. Necessary to order the following material:

- 2 Metal joiner doors 1 right, 1 left 28 x 78 x 1 3/4 thick complete with hardware and rame with no lock
- 2 Right hand doors complete with hardware insulated door closer, lock and keys 1 3/8" thick 28" x 78" for steel bulkhead with frame
- 500 ea. 10/32 x 1/2 stainless steel truss head machine screw and nuts
- 300 #10 x 3/4 truss head stainless steel sheet metal SC
- 200 ea. 1/4 x 1/2 F-H Stainless steel machine sc
- 4 pc. 1/4" safety glass 10" x 12"
- 1 3/16 x 96" x 240" plate
- 1 sht. 16 ga. stainless steel 3' x 10' 1 side polish
- 400' 1/8 x 1 1/2 x 1 1/2 stainless steel angle
- 6 shts 16 ga. stainless steel 3' x 10' 1 side polish
- 1 sht 16 ga. stainless steel 4' x 10' 1 side polish
- 60' 1/4" x 3 1/2" x 5" angle
- 40' 1/8 x 1 1/2 x 1 1/2 stainless steel angle
- 4 shts 16 ga. stainless steel 4' x 10' 1 side polish

84 GALLEY CONVERSION (Con't)

A. MATERIAL PROCUREMENT

2 shts	16 ga. stainless steel 3' x 10' 1 side polish
1 sht	20 ga. stainless steel 4' x 10' 1 side polish
4 shts	16 ga. stainless steel 3' x 10' 304-3
3 shts	16 ga. stainless steel 4' x 10' 304-3
1 sht	14 ga. stainless steel 4 x 10' 2B finish type 304 126#
3 pcs.	1/4" safety glass 10" x 12"
2	Piano hinge stainless steel 3/4" 6' close 1 1/2 open no. 1584A63
4	Pull knobs 1 1/4 diam. perko #925
4	Barrel bolts 3" long 1/4" pin
100 ea.	#8 x 1/2 truss head stainless steel sheet metal sc.
1 sht	11 ga. stainless steel type 304 2B finish 4' x 10'
1 roll	16 mesh stainless steel screw 3' x 100' 300s
6	Stanley magnetic door closer No. 45ALD
6	Stanley cabinet catch No. 35
6	212° fuseable links
6	160° ditto
2	10" round sealing type diffusers with damper as instructed, Hart and Cooley #16 and 12 damper
2	Grease filters 19 3/8 x 19 3/8 type #44H P/N 173-3 2"
4	Pkg. stainless devcon
5 gal.	Zinc chromate
12	Cartridge Silicon sealer clear RTV 732
4	Switches, single pole, P&S #1411
4	Switches, 3 way, P&S 1413 (QST 3-I)
6	Two gang alum weather proof boy cat. LT11 (276-3)

A. MATERIAL PROCUREMENT

- 3 Receptacles and switch, water tight, single pole, surface mound,
 (Russell and Stowell) #478-45
- 5 Receptacles, single 2 wire, 3 pole, Model 479-45
- 12 Duplex, stainless steel cover plates receptacles, sierra cat.
 #3-82 P&S 93102
- 8 Stainless plates dispard P&S ir 1615
- 8 Straps #1347 P&S
- 2 Hilti Conic fasteners EW6-20-12T12 (100@)
- 2 3/240 purple #6 extra heavy, 27 gauge shells
- 4 Single, stainless steel wall plates receptacle - 15 amp
- 4 Duplex, stainless steel wall plates
- 6 P1-259 coax plugs
- 2 PL-258 Coax Straight adaptor
- 2 M-358 Tee-adaptors
- 2 PL-258 straight adaptors
- 4 P1-259 plugs
- 2 SO-239 receptacles
- 6 Two gang moisture proof bell box, cat. no. 276-5
- 6 Stainless steel plates, cat. #97102 for duplex receptacles
 for the above bell box
- 4 3-way H & H switches, QST 31
- 1 ITE Breaker, 3 pole, F-Frame, Type ETM, 600 volts AC, 70 amps
- 1 8" wall baffle, walnut finish
- 1 8" speaker, 8 ohms, 15 watts
- 1 Vent exhaust fan blower, 440 volts, 3 ph. 1750 RPM, 900 RPM,
 2 HP, 2 speed, repaired
- 1 Two hp, two speed, controller with stop, slow and fast push
 button, MFGD.

84 GALLEY CONVERSION (Con't)
PART I

A. MATERIAL PROCUREMENT

- 1 sht 1/16" x 3' x 12' #949-60 formica
- 1 sht 1/16" x 3' x 8' Ditto
- 2 Sheets 1/16" x 4' x 8' formica brand plastic laminate.
Antique white, design 949 - 60 finish
- 2 Gallons formica contact cement
- 2 Sheets 1/16" x 4' x 8' white #949 - 60 formica brand laminated
plastic
- 2 Gallons contact cement for above
- 1 Sheet 1/16" x 4' x 8' wheat #891-64 finish formica brand plastic
laminate
- 1 Gallon contact cement for above

Additional to above is all pipe, wire, plywood, planeling, steel and fittings
which were already in the Shipyard's stock.

B. ENGINEERING REQUIREMENTS

Provide Engineering services to develop drawings and procedures for approval
by ABS, USCG Representatives, and U.S. Public Health Service.

C. SHEETMETAL SHOP FABRICATION

Provide labor as required to shop fabricate sheetmetal components. (To
include vent ducting, stainless steel bulkhead sheathing, counter tops
and equipment racks). See the General Notes, after Item .

D. SHEETMETAL SHIPBOARD INSTALLATION

Provide labor as required to install and relocate shipyard and Owner-
furnished equipment. (To include all shipboard removals and installations).
See the General Notes, after Item .

E. PIPING MODIFICATIONS TO SHIP'S GALLEY, OFFICERS AND CREW'S MESS

Provide labor as required to accomplish shipboard piping modifications. (To include removals, relocation and shipboard tests). See the general criteria, after Item # .

F. ELECTRICAL MODIFICATIONS TO SHIP'S GALLEY, OFFICERS AND CREW'S MESS

Provide labor as required to accomplish electrical modifications (To include removals, relocation, electrical maintenance and shipboard test). See the general notes, after Item # .

G. SHIPFITTER MODIFICATIONS TO SHIP'S GALLEY, OFFICERS AND CREW'S MESS

Provide labor and materials to accomplish removals, shop fabrications and shipboard hull modifications. (To include equipment foundations, bulkhead removals, strengthening, after removals, if required. See the general criteria, after Item # .

H. RIGGING SERVICES

Provide all rigging and crane service for refurbishment modifications. (To include shop and shipboard requirements, and from receiving department to vessel).

I. TRANSPORTATION

Provide labor and equipment to transport all material and equipment during refurbishment modifications.

J. OVERHEAD CEILING INSTALLATIONS

Provide labor and material to accomplish overhead ceiling installation.

All material U.S.C.G. approved, suspended type ceiling. Furnish welders as necessary to assist subcontractor while installing support brackets.

K. DECK REQUIREMENTS

Provide labor and material to accomplish decking modifications as required.

Patch the decking in the galley as directed by the Owner's Representative. Renew all disturbed tile in the game room and both passageways. Install underlay material on the deck in the lobby, just fwd. of the officer's mess serving windows.

L. PANELING INSTALLATION

Provide labor and material to accomplish paneling modifications as required.

Apply furring strips and paneling to the fwd., port and starboard bulkhead in the crews mess. All material U.S.C.G. approved. Furnish welders as necessary to assist the subcontractor while installing furring strips.

M. REEFER BOX RELOCATION

Provide Subcontractor to assist shipyard in the relocation of the non-self-contained reefer box. Subcontractor to install one (1) new gauge on the after side of the reefer. Also run necessary pipes and tubing to connect reefer in the new location.

N. CLEAN-UP

Provide labor, make removals, clean up and remove debris from work areas during modifications. Necessary to chip decking material in way of each foundation, dresser support, around the bulkheads in way of tables in the galley and crews mess. Completely chip up all decking material in the lobby, just fwd of the officer's mess serving windows.

Install ship furnish tile to the floor in the officer's mess just prior to subcontractor installing carpet.

O. PAINTING TOUCH-UP

Provide labor and material to prime coat all new and disturbed areas.

Mask off all stainless steel dressers, serving windows, sinks, dishwashers, reefers, grills, stoves, power panels, etc. Apply one (1) white color coat of paint to the bulkheads, overhead and duct work in the galley and the lobby.

Apply one (1) color coat to trim on new panel installed in game room, in way of old window.

P. CARPENTRY FABRICATION AND INSTALLATION

Provide labor and material as required to fabricate and install wood components.

Fabricate and install the following:

One (1) 42" x 15' table, plywood with formica top.

One (1) 36" x 15' table, plywood with formica top.

Two (2) 24" x 24" teak blackboard frames.

Furnish and install the following panel:

One (1) 7/8" x 4' x 8' bulkhead panel - in the game room.

One (1) 7/8" x 3' x 4' bulkhead panel - in the officers mess

Two (2) 1/4" x 4' x 52" overhead panels - passageway

One (1) 1/4" x 3' x 52" overhead panels - passageway

Q. INSULATION REPAIRS

Provide labor and material to repair all disturbed insulation and install new insulation as necessary.

The following are general notes in conjunction with the Item series concerning the refurbishment (Betterment) of the ship's galley and Officer's and Crew's Mess:

Part II

A. TIME AND MATERIAL TO BE CHARGED TO INDIVIDUAL GALLEY CONVERSION SERIES ITEM AS APPLICABLE

Remove equipment and furnishings are to be held for reuse or disposition by the Owner. New galley and mess room equipment shall be stored and protected until time of installation. All contractor furnished materials shall be in accordance with the applicable plans.

B. REMOVALS

Remove all piping and electricals not required for new installations. Rip out transverse bulkhead in its entirety, at Frame 25 1/2. Remove all bulkhead and overhead sheathing within the area created port and starboard between frames 10 1/2 and 27. Disconnect and remove the dishwasher, garbage disposal and control panel, sink and piping and the dresser along the bulkhead at frame 25 1/2. Install welded blanks on all pipes at the deck.

In order to rig old equipment from the galley and messroom and the new equipment into same, crop out one (1) 46" x 87" access opening in the after bulkhead. Also crop off one (1) approximately 12" dia. gooseneck vent in way of same and temporarily blank it off. Insert one (1) 18" x 24" window in the access plate. Remove the dresser, coffee maker, reefer, locker and shelves from the bulkhead at frame #21.

Remove the work table, lavatory, shelves and dresser along the port bulkhead, oven on the aft bulkhead, after range and boiler and the after oven and shelves from the galley.

Disconnect and remove two (2) bulkhead panels into the officers mess in order to have access for new equipment. Necessary to make removals of overhead panels.

Disconnect and remove four (4) tables from the Officer's mess and two (2) from the Crew mess, for scrap.

Make necessary removals of overhead panels in the Officers and Crew mess in order to install new wiring and duct work. Remove existing overhead panel from the passageway, now to be in the Crew's Mess.

Disconnect and scrap the existing hood from the overhead in way of the after oven. Necessary to fabricate new overhead sheet metal panels to install where hood removed.

C. MODIFICATIONS AND RELOCATIONS

1. Doors - Total of Three (3)

Completely disconnect and lower the door frames on three (3) doors to 1/2" above deck. Chip magnisite from around base of door and crop out same. Install 1/4" x 30" x 5" inserts above doors.

2. Officer's Messroom Door

Crop out door completely as directed. Door already modified as above. Necessary to relocate light switches to Officer's Mess from removed bulkhead. Also fabricated and fitted new stainless steel trim where door removed. Modify the existing paneling.

3. Coffee Maker

Disconnect coffee maker from lobby and locate in crew's pantry. Make necessary pipe and electric connections.

4. Boiler - Existing

Make removals from surface of boiler and fabricate new counter type top from stainless steel and install. Crop and modify as necessary. Approximately 3' x 4'.

5. Range - Existing

Remove and scrap. Fabricate a new stainless steel frame and counter top to fit into area where range removed. Approximately 4' x 3' x 3'.

6. Galley Stove Exhaust Fan

Procure and install new two (2) speed fan. Make necessary removals of hood to reach motor and wires. Supply necessary controller and install.

7. Dresser and Sink

Relocate from bulkhead 25 1/2 to the port bulkhead in the galley. Secure as necessary to the deck. Run piping as necessary to the sink.

8. Dishwasher

Relocated from bulkhead 25 1/2 to the port bulkhead in the galley. All pipe and electric runs made but not connected when it was decided, by Owner's Representative that the shipyard should supply and install a new dishwasher. Procure and install new dishwasher, necessary to modify the dresser on each side in order to fit the dishwasher.

C. MODIFICATIONS AND RELOCATIONS

9. Procure a 220 volt Preheater for Hobart Dishwasher

Plug up newly run, steam line to old dishwasher. Complete pipe and wire as necessary. If a Hobart brand preheater is not available, another brand is to be used. Necessary to disassemble same and modify so as to work with the Hobart dishwasher.

The Preheater causes interference with existing drawer on counter. Remove drawer, fabricate and install one (1) stainless steel 24" x 8" x 27" drawer and install, using old runners, in new fryer table at range.

10. Heaters - Radiator Type

Disconnect two (2) heaters from emergency quarters and install in new crews mess on port and starboard bulkhead. Furnish fittings and blank of all lines where heaters removed. Necessary to penetrate deck and connect in to steam lines below and run necessary piping. This pipe to be insulated. Staging required.

11. Hand Sink

Scupper and area in way of cleaning access due to location of new hand sink in the drawers in the original cabinets cannot be opened. Necessary to remove the drawer supports and sheet metal sides of cabinet so as to provide access.

12. Potable Water Tank Vent

Relocate a 2" potable water tank vent from overhead, in way of serving window, to approx. 12' above deck.

13. Officer's Messroom Server

Remove one (1) existing approx. 3' x 3' x 3' sheetmetal cabinet to shop. Fabricate a new stainless steel cabinet the same size and install the top from the old cabinet. Rig to ship and install on original foundation. New cabinet is open faced with one (1) adjustable shelf.

14. General Alarm Bell

Relocate general alarm from old crews mess to the new crews mess, necessary to make removals of overhead panels.

15. Intercom

Relocate speaker from old crews messroom to new messroom. (No additional wiring required). Furnish and install a new speaker, old speaker already installed.

PART II

C. MODIFICATIONS AND RELOCATIONS

16. Overhead Light Switches

Relocate two (2) original three-way light switches for galley light fixtures. Necessary to remove overhead panels to run wiring.

17. Galley Stove Exhaust Fan Hood

Remove hood over grease filter and blank off with stainless steel. Fabricate and install hinged sheet metal covers for two (2) grease filters. Approximately 18" x 30".

Modify two (2) 4' stainless steel coffee cup racks to make four (4) 2' coffee cup racks. Cleaned and polished and installed on the bulkheads in the messhalls as directed.

18. Reefer

Disconnect and remove from its foundation. Fabricate and install a new foundation. Seal of fwd. four (4) doors on reefer so they can't be opened. Install on new foundation and make necessary electrical and piping connections.

D. FABRICATION AND INSTALLATION

1. Messrooms Port and Starboard

Furnish and install closure bulkheads in port and starboard passageways at Frame 26. Crop openings in these locations to receive new doors and frames. Furnish and install new joiner doors with view ports and hydraulic closures in way of the bulkheads. Doors to be non locking type.

Install foundations of new Owner's equipment port and starboard. Install new Owner's equipment and secure. Fabricate and install stainless steel tables, shelves, storage, and counters in accordance with plans.

Items fabricated and installed in Officer's and Crew's mess.

One (1) 10' x 3' x 30" stainless steel dresser with two (2) 15" x 23" doors and two shelves. Fitted with one (1) dish dispenser. JSI Drawing #10542.

One (1) 7' x 12" x 2" stainless steel shelf with four (4) mounting brackets. JSI Drawing #10542.

PART II

D. FABRICATION AND INSTALLATION

One (1) 6' x 35" x 30" stainless steel dresser with two shelves.
Fitted for one (1) dish dispenser. JSI Drawing 10541.

One (1) 48" x 24" x 33" stainless steel dresser with two (2) shelves.
Fitted with one (1) dish dispenser and one (1) ice cream sink.
Necessary to furnish and install pipe to run a drain from the ice
cream sink to the drain at the water fountain approximately 5' away.
Pipe run to meet U.S.D.H. regulations. JSI Drawing 10543.

One (1) 14" x 19" x 2" stainless steel shelf with two (2) 12" x
12" support brackets.

Two (2) 13" x 24" x 2" stainless steel shelves and two (2) mounting
brackets each.

One (1) 6' x 12" x 2" stainless steel dresser - installed, removed
and modified in order to install new coffee brewer, reinstalled.

One (1) 15" x 30" x 28" cover plate for dish dispenser, with one
(1) access hole.

One (1) 16 ga. x 14" x 19" stainless steel shelf.

One (1) new drinking fountain - procure and install.

One (1) 60" x 15" stainless steel serving shelf JSI Drawing #10548.

One (1) 51" x 15" stainless steel serving shelf JSI Drawing #10548.

Ship supplied Items installed:

Three (3) food warmers
Two (2) silver containers
Two (2) microwave ovens
One (1) electric stove
Two (2) coffee brewers
Two (2) ice cream freezers
One (1) toaster
One (1) bowl dispenser
Four (4) dish dispensers - in new dressers
One (1) salad and dresser case

Fabricate necessary foundations and supports for above. Furnish
wire and install new outlets and connect new lights as installed
by the subcontractor.

PART III

A. MESSROOMS PORT AND STARBOARD

1. Overhead Light Switches

Install two (2) pair of three-way light fixtures for new crew messroom, one (1) pair to control half of lights.

2. Power Receptacles

Install eight (8) double duplex and four (4) duplex power receptacles in the officers messroom, new crews messroom and in galley as directed for new equipment and spares. Necessary to remove overhead panel to install wiring.

B. GALLEY

Install foundations for new equipment. Modify electrical systems and piping and install new insulation and sheathing as required.

Install closure bulkhead in the transverse bulkhead at Frame #21. Crop openings in this bulkhead for a door and two (2) serving windows.

Furnish and install steel doors with view ports and hydraulic closures on galley bulkhead starboard. Doors to be equipped with locking hardware. Fabricate and install stainless steel passing window closures port and starboard.

Install foundations for new Owner's equipment port and starboard. Install new Owner's equipment and secure. Fabricate and install stainless steel tables, shelves, storage, and counters in accordance with plans.

PART III

B. GALLEY

Items fabricated and installed:

One (1) 40" x 30" x 16" stainless steel cabinet with an 8" x 8" x 16" hand sink. Install water faucets and connect same. JSI Drawing #10563.

One (1) 35" x 36" x 31" stainless steel counter JSI Drawing #10583.

One (1) 83" x 28" x 36" stainless steel dresser with two (2) food warmers and three (3) dish dispensers - JSI Drawing #10546.

One (1) 14" x 30" stainless steel shelf - JSI Drawing #10546.

One (1) 54" x 30" stainless steel temporary serving window cover JSI Drawing #10548.

One (1) 48" x 30" stainless steel temporary serving window cover JSI Drawing #10548.

One (1) 54" x 15" removable stainless steel shelf - JSI Drawing #10548.

One (1) 36" x 24" x 30" stainless steel dresser - JSI Drawing #10547.

One (1) 48" x 27" x 36" stainless steel dresser - JSI Drawing #10544.

One (1) 43" x 59" x 13" stainless steel hood with one (1) light, ship supplied, installed with necessary wiring and two (2) filters.

One (1) 25" x 36" x 72" aluminum utility locker with stainless steel front.

One (1) 72" x 60" stainless steel back splash plate in way of new range.

Ship supplied items - installed:

One (1) slicer

One (1) deep fat fryer

Two (2) food warmers - in new dresser

Three (3) dish dispensers - in new dresser

Two (2) toasters

One (1) mixer

One (1) freezer

One (1) range

One (1) micro wave oven

Fabricate necessary foundations and supports for above.

PART III

C. DUCT FABRICATE, MODIFIED AND INSTALLED1. Crews Messroom Air Condition Ductwork

Fabricate and install approximately 15' of shaped 5" x 12" duct to be spudded into existing A.C. ductwork with a volume control damper. Transition piece to 3" x 20". Necessary to pass through longitudinal. Approximately 10' of 3" x 20" duct used. Install two (2) 10" drops with ceiling type diffusers. Install one (1) 5" x 23" x 6" x 1/4" collar where duct penetrates longitudinal.

Crop out and scrap two (2) existing fresh air ducts and blank off same.

2. Fresh Air Duct from Crews Mess to Galley

Modify approximately 10' of existing 6" x 18" duct. Fabricate and install approximately 5' of 6" x 18" new duct with a flange. Spool piece to penetrate galley bulkhead. Install one (1) new automatic fire damper and "Y" in galley. Spud off of "Y" with one (1) section of old 7" diameter duct with terminal, approximately 8' long, also spud off of "Y" with one (1) section of old 5" x 11" duct approximately 4' long. Fabricate and install one (1) horizontal to vertical transition piece, between dishwasher hood and range hood. Fabricate and install approximately 12' of 5" x 11" duct with terminal from transition piece to just aft of range hood. Insulation required.

3. Dishwasher Hood and Duct

Fabricate and install one (1) stainless steel hood, approximately 38" x 31" x 13", over dishwasher. Fabricate and install approximately 10' of 4" x 9" shaped duct from dishwasher hood to existing range hood.

4. Galley Duct - Exhaust For Hoods

Fabricate and install one (1) new approximately 43" x 59" x 13" stainless steel hood over new range with duct running to the existing hood over old range. Duct to consist of one (1) 4 1/2" x 15" x 3" x 20" drop check elbow, One (1) 3" x 20" x 5" x 12" transition piece approximately 3' long, approximately 2' of 5" x 12" duct, one (1) approximately 2' long 5" x 12" O.G. offset, and one (1) 5" x 12" 90° elbow with turning vanes. Necessary to crop out and install one (1) 3/8" x 23" x 4" oval collar where duct penetrates longitudinal.

Necessary to remove and scrap old lagged duct from existing hood. Above new hood to be fitted with two (2) 19 1/2" x 19 1/2" filter racks and filters, a stainless steel top and a shaped inner baffle. Also install one (1) light, vessel-furnished, and necessary wiring in same.

PART III

D. GAME ROOM INSTALLATIONS

Take delivery of one (1) Owner furnished weight machine. Assemble same and secure to the deck with clips as directed by the Owner's Representative. It is necessary to disconnect one (1) diffuser from overhead duct, not in use, and remove same in order to obtain overhead clearance for the weight machine. Furnish and install a patch where diffuser removed. Make necessary removals of overhead panels.

Install one (1) closure in bulkhead opening to the galley, previously a serving window. Furnish and install one (1) bulkhead panel and necessary sheet metal trim.

PART IV

ELECTRICAL (General):

To the extent that is possible, existing cable shall be utilized and relocated to suit the above installations. Supply and install cable, outlets, panels, circuit breakers and switches new and existing to be as shown on isometric plans. See JSI Drawing #10552.

PART V

PIPING (General):

In way of removals, existing piping shall be removed to header and blanked. Galley piping is to be rerouted and connected to suit the new installations. Supply all necessary piping, fittings, valves and fixtures necessary to complete this work. All installation, new and existing, to be as shown on as built schematic. See JSI Drawing #10573.

PART VI

FIRE PLAN

Vessel's fire plan shall be modified to show new compartments created by this modification. Furnish two (2) framed copies of revised plans and install as directed by the Chief Officer.

85 BOTTOM WELDING - 103 - DO NOT START UNTIL AUTHORIZED BY OWNER'S REPRESENTATIVE

Furnish necessary labor, equipment and material required to complete the following:

- a. Chip out and reweld 300' of eroded welds on bottom shell seams and butts - (3) passes required.
- b. Quote per foot height for supplying erecting and removing staging on dry dock. Stipulate the standard width of sections which you use.

6. I. Sewage Retention - Amidship House

Furnish labor and material required to modify the existing sewage overboard discharge system to add two (2) sewage holding tanks in the amidship square, one port and one starboard. The system is to be complete with tank level and alarm system, saltwater wash down system, and tank self-drainage system (one system per tank). The modified sewage handling system is to be capable of going overboard or to a holding tank.

Modify the sewage piping to collect only black water. Insure that all newly installed drain lines are properly sloped (at least 1/4" drop per foot of pipe run). All new piping is to be extra strong galvanized.

Fabricate and install two 1,000 gallon holding tanks (approximate size 4'25. x 5' x 6'6 - see attached sketch) in the amidship square (one port and one starboard). Each tank is to have smooth interior with no internal framing (external framing for strengthening). They are to be shaped so as to allow last gallon drainage. Interiors are to have surface preparation of white metal blast (SS SA3), then apply two (2) coats of rust ban 6692 black coal tar epoxy or equal 8 MDFT each coat (16 MDFT total). Exterior of tank and foundation are to have surface preparation of white metal blast (SS SA3), then apply one (1) coat rust ban 191 or equal 4 MDFT, one (1) coat rust ban 6259 or equal 1 MDFT, and one (1) coat rust ban AK6403 or equal 2 MDFT. The tank shall be constructed with a suitable manhole access centered over the suction penetration. Furnish and install a 4" drain system from the tank overboard. Supply and install valve, piping, and scupper. A 2 1/2" vent system is to be incorporated from each tank to a suitable location above deck.

Install a tank level and alarm system for each tank to alarm in the ship's cargo office and indicate tank level. Level switches are to be DeLaval, Gems Single Station Liquid Level Switches -owner furnished. The level switches are to indicate when the tanks are 3/4 full.

Install a saltwater spray-down system in each holding tank supplied from the ship's saltwater service system. The spray-down system is to consist of one (1) 6353-3/8-22 (stainless steel) nozzle per tank. Also install a backflush line to the tank drain suction tail piece, tank inlet, and tank bypass from the saltwater service system.

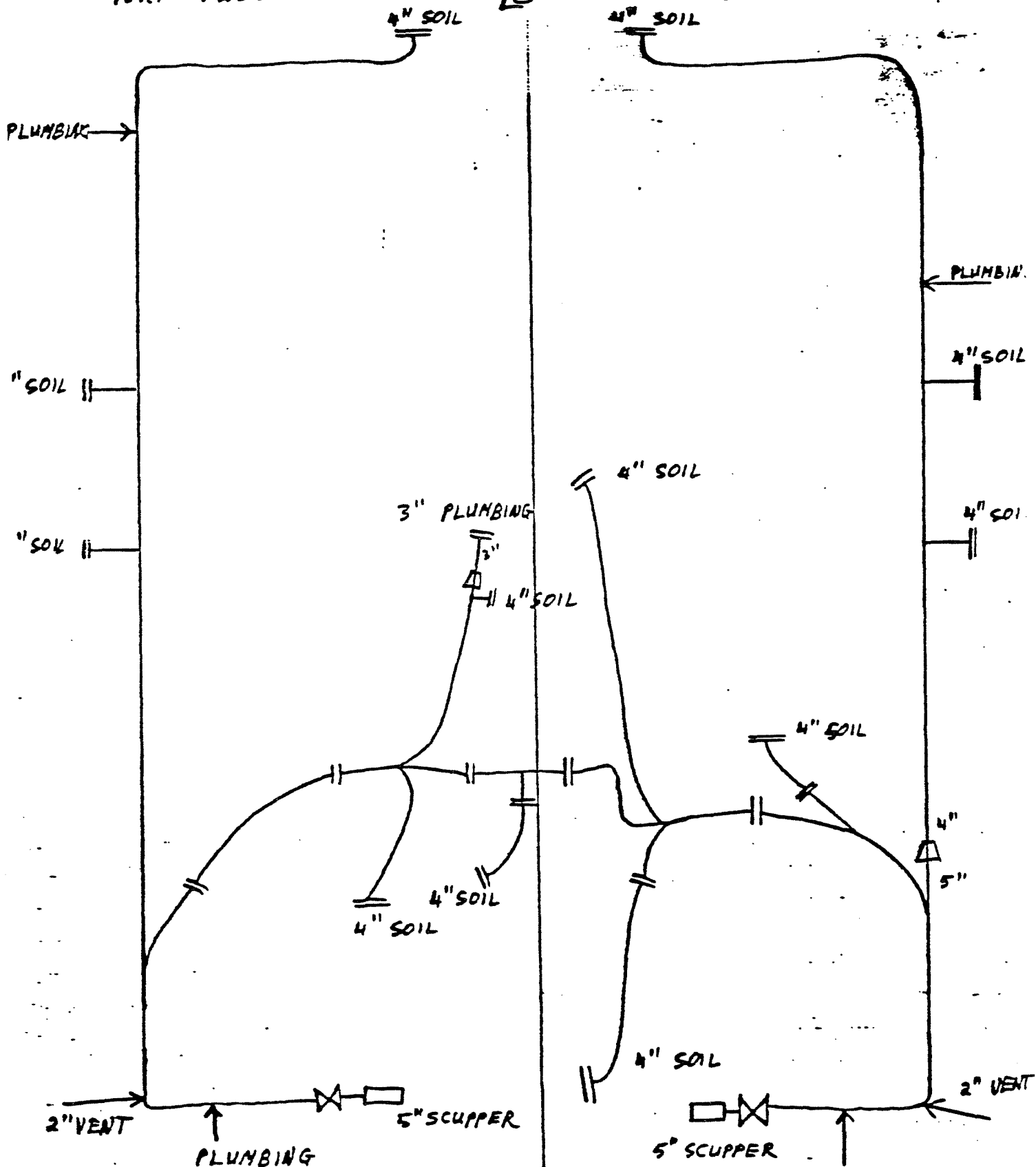
Develop piping layout, design details, and equipment purchases. Provide engineering services to produce drawings and obtain approvals from USCG, ABS, USPHS, owners and others as required. Approval is to be obtained in the final drawings for all revisions or modifications. After completion, prove operation to satisfaction of all concerned.

- AHIDSHIP SEWAGE RETENTION - EXISTING -

PORT FWD ↑

STARBOARD FWD ↑

LC



SHEET-NO. 55

EXXON BOSTON

PLUMBING SEPT. 1978

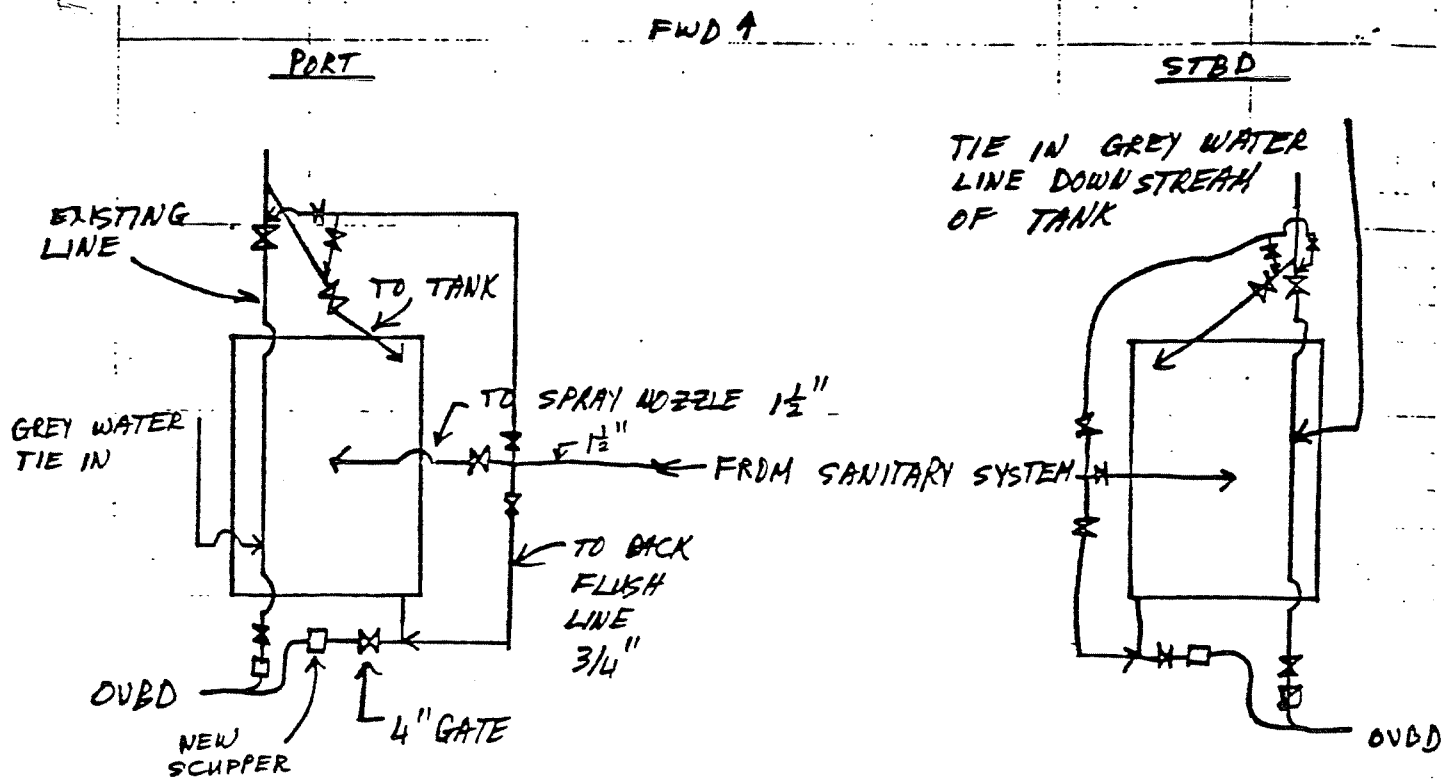
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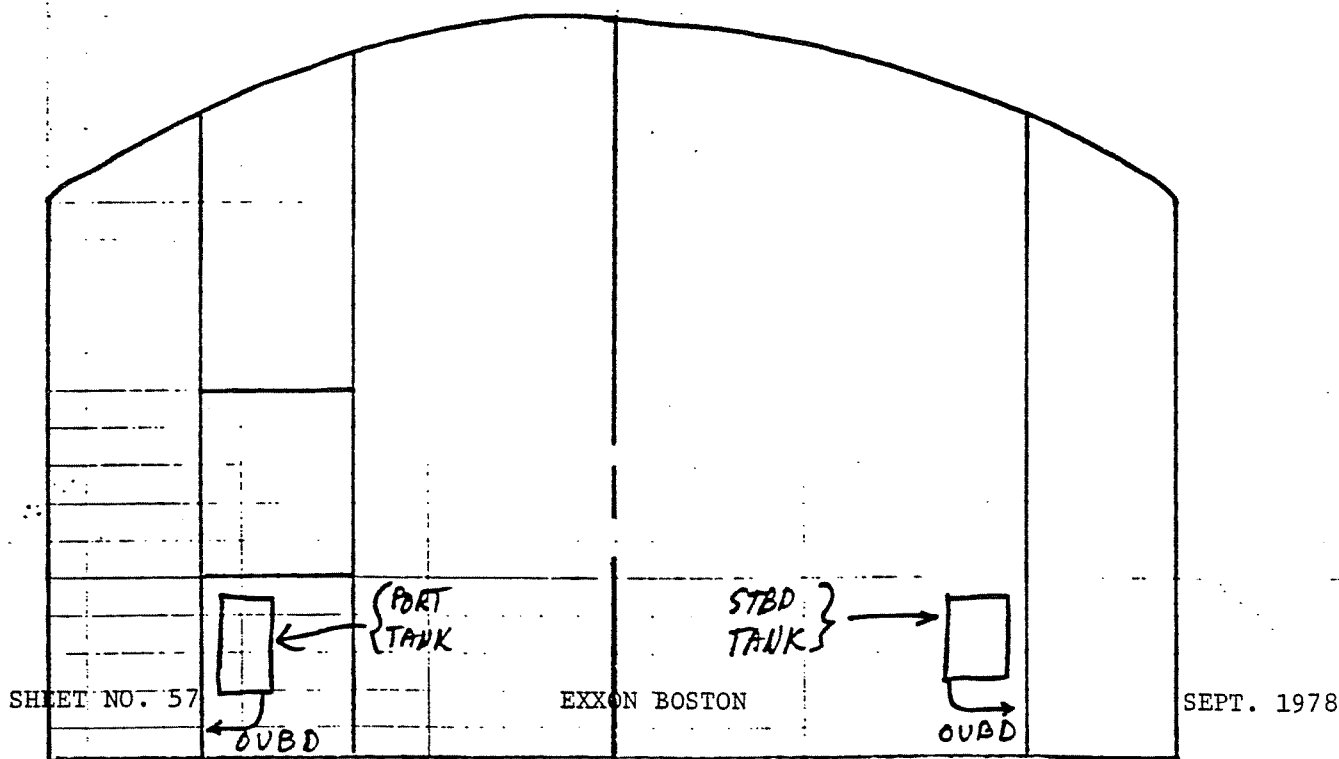
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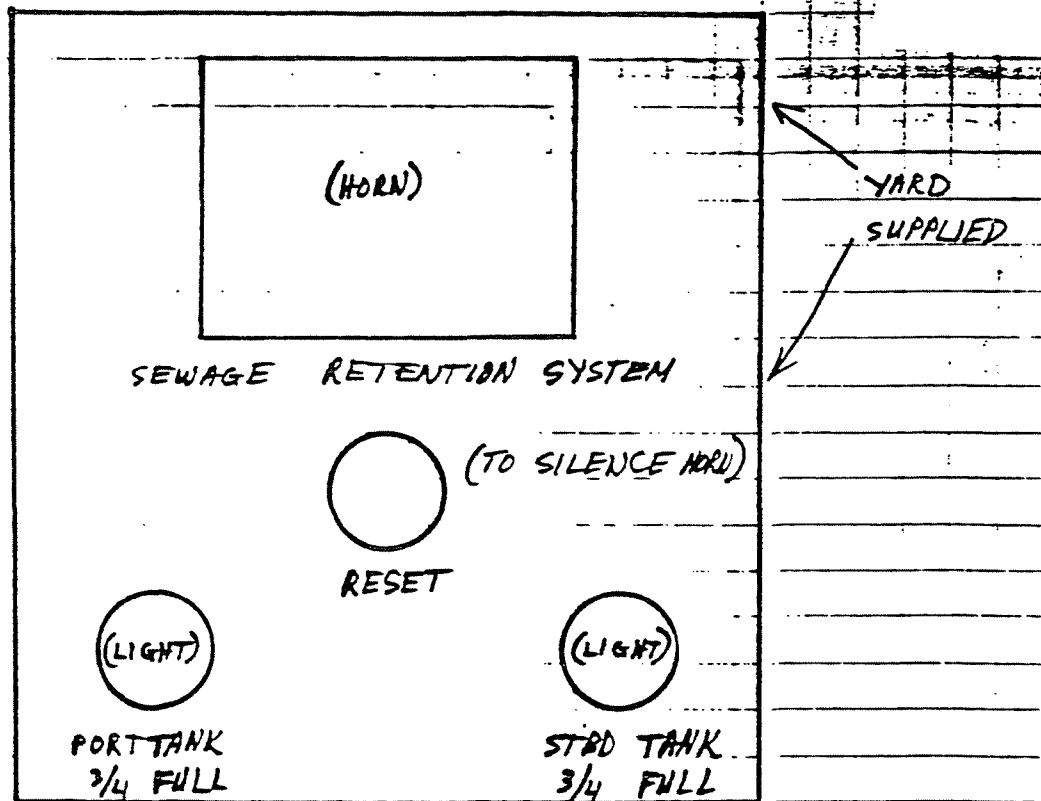
SEWAGE TANKS - AMIDSHIP -



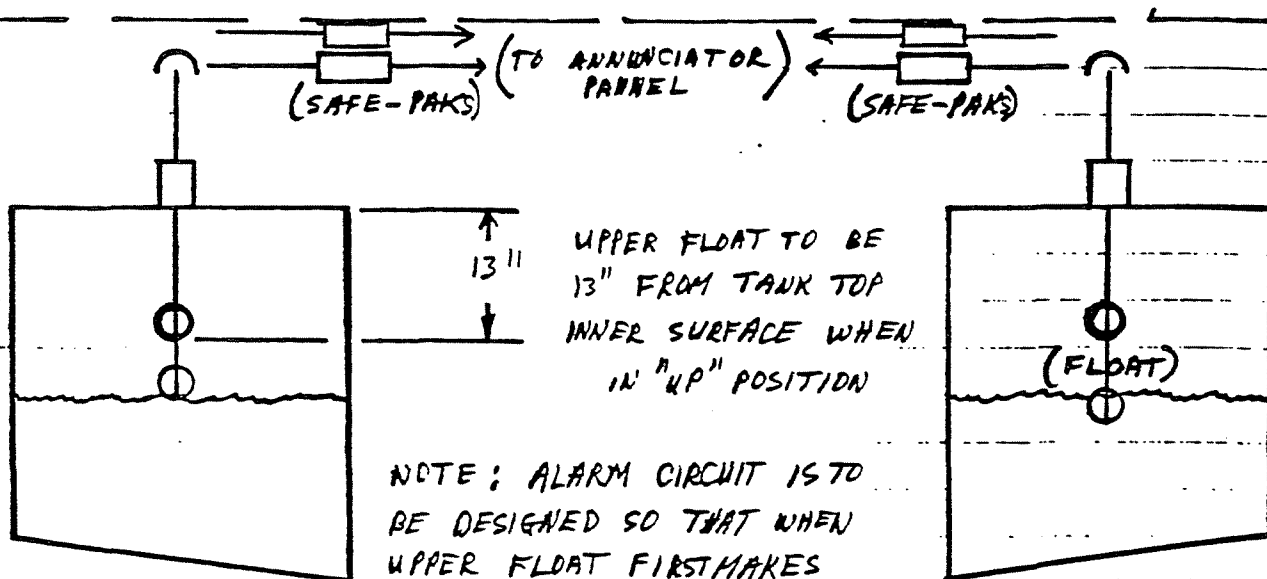
TANK ORIENTATION



SEWAGE RETENTION SYSTEM - HIGH LEVEL ALARM



SAFE PAKS AND FLOATS ARE OWNER FURNISHED



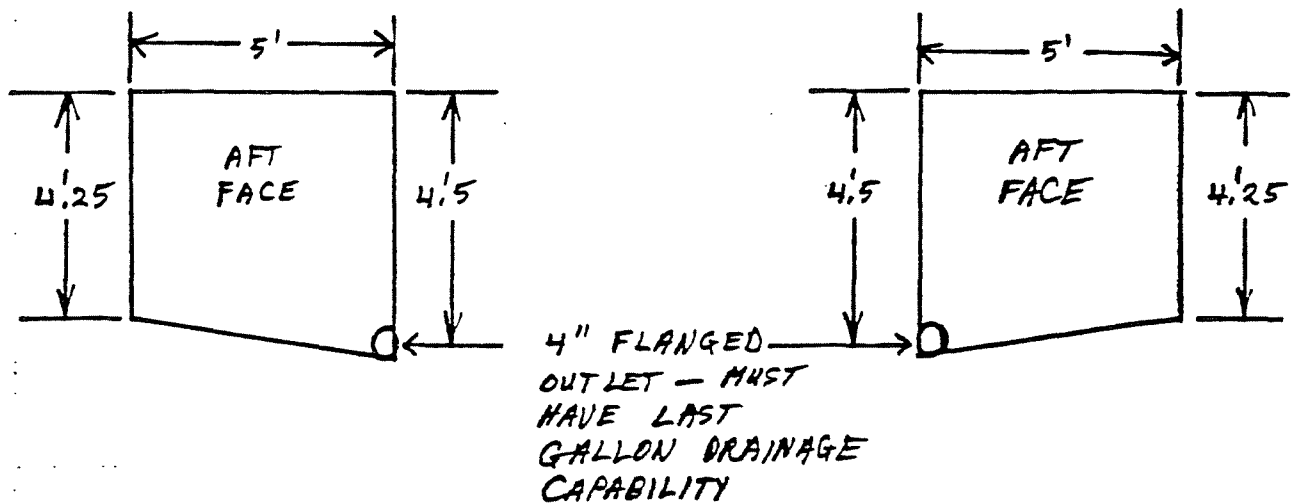
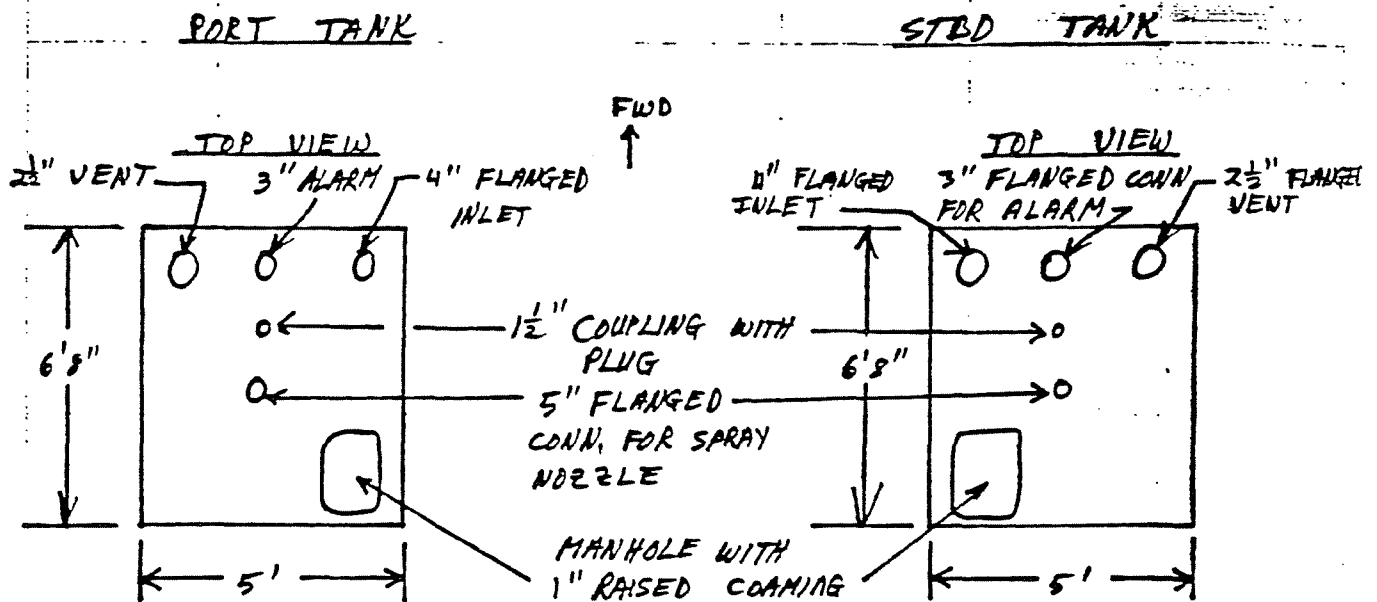
SHEET NO. 58
PORT TANK

STBD TANK SEPT. 1978

NOTE: ALARM CIRCUIT IS TO BE DESIGNED SO THAT WHEN UPPER FLOAT FIRST MAKES CONTACT, THE AUDIO AND VISUAL INDICATORS REMAIN ENERGIZED UNTIL THE LOWER FLOAT RETURNS TO ITS NORMALLY OPEN POSITION (DOWN POSITION)

EXXON BOSTON

SEWAGE RETENTION TANKS - AMIDSHIP HOUSE



NOTE: TANK IS TO HAVE EXTERNAL STIFFENING - ALL SMOOTH INTERIOR SURFACES

EXXON BOSTON - 1978 SHIPYARD SPECIFICATIONS

II. FAST Sewage System Installation - Afterhouse

Furnish labor and material required to modify the existing sewage overboard discharge system and to install one FAST treatment system (FAST 26M owner furnished) on the port side of the lower engine room space, in the 20-40 frame area (see sketch). Obstructing piping and equipment are to be relocated as necessary. The FAST system is to be installed as per the manufacturer's guidelines. The modified sewage system is to be capable of going overboard or to the FAST system.

Remove the toilet shared by the two deck maintenance rooms on the starboard side (between frame 16 and 18) and cap the 4" drain line.

Modify the sewage piping system as per the sketch attached. Cut into the six (6) 4" soil lines in the engine room leading to the six scuppers (three port and three starboard) and install twelve gate valves. Six valves are to direct waste to the FAST System and the second six to direct waste overboard (see sketch). Install new drain lines to the FAST system and direct treated discharge overboard through the aft port scupper. Insure that all newly installed drain lines are properly sloped (at least 1/4" drop per foot for pipe running aft or athwartship, and at least 3/8" drop per foot for pipe running forward). New 4" drain piping is to be extra strong galvanized.

Develop piping layout, design details, and equipment purchases. Provide engineering services to produce drawings and obtain approvals from USCG, USPHS, ABS, owners, and others as required. Approval is to be obtained in all final drawings. After completion, prove work to satisfaction of all concerned.

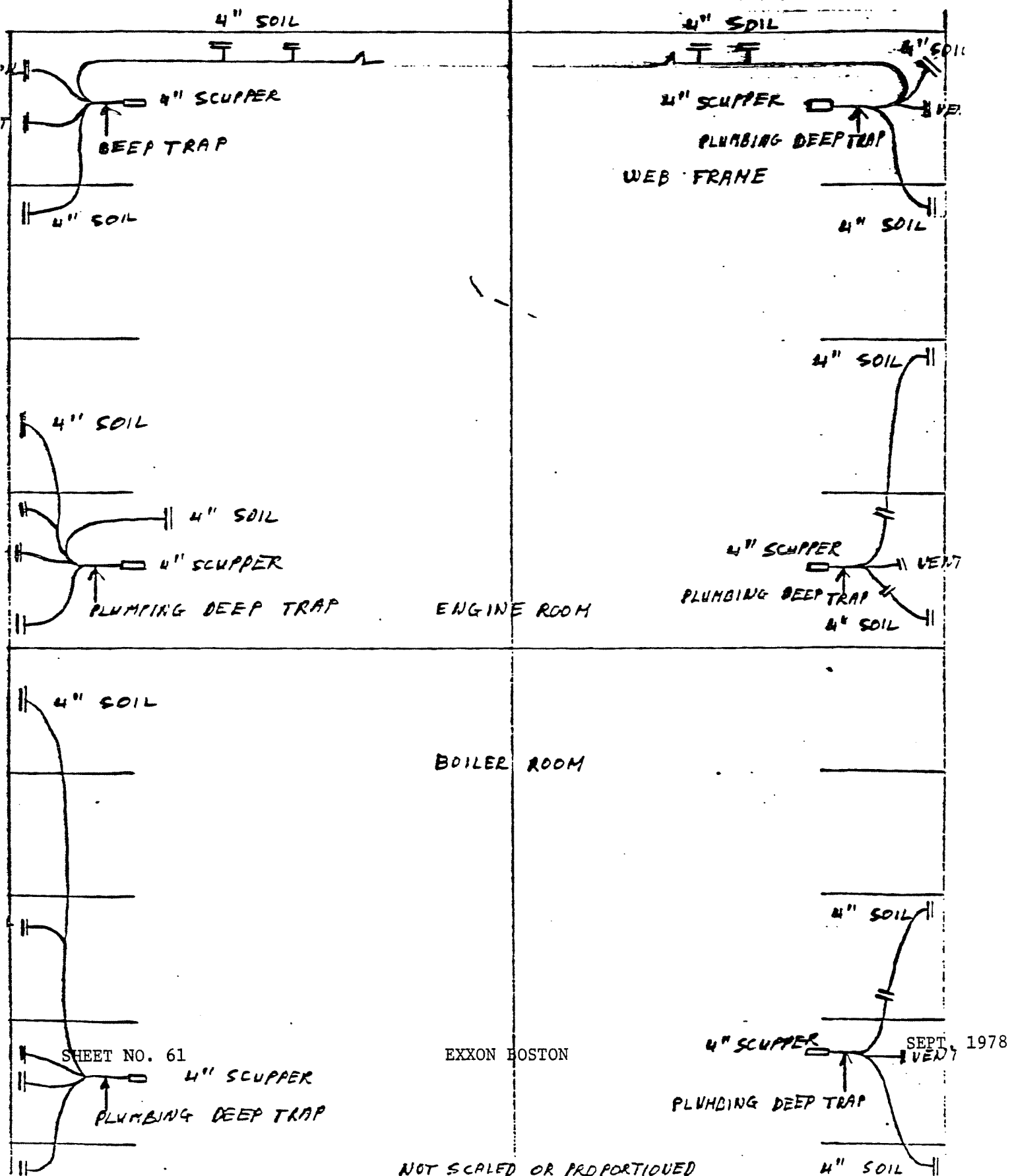
- AFTER HOUSE SANITARY SYSTEM

PORT FWD

EXISTING

K

STARBOARD FWD



SHEET NO. 61

EXXON BOSTON

SEPT 1978

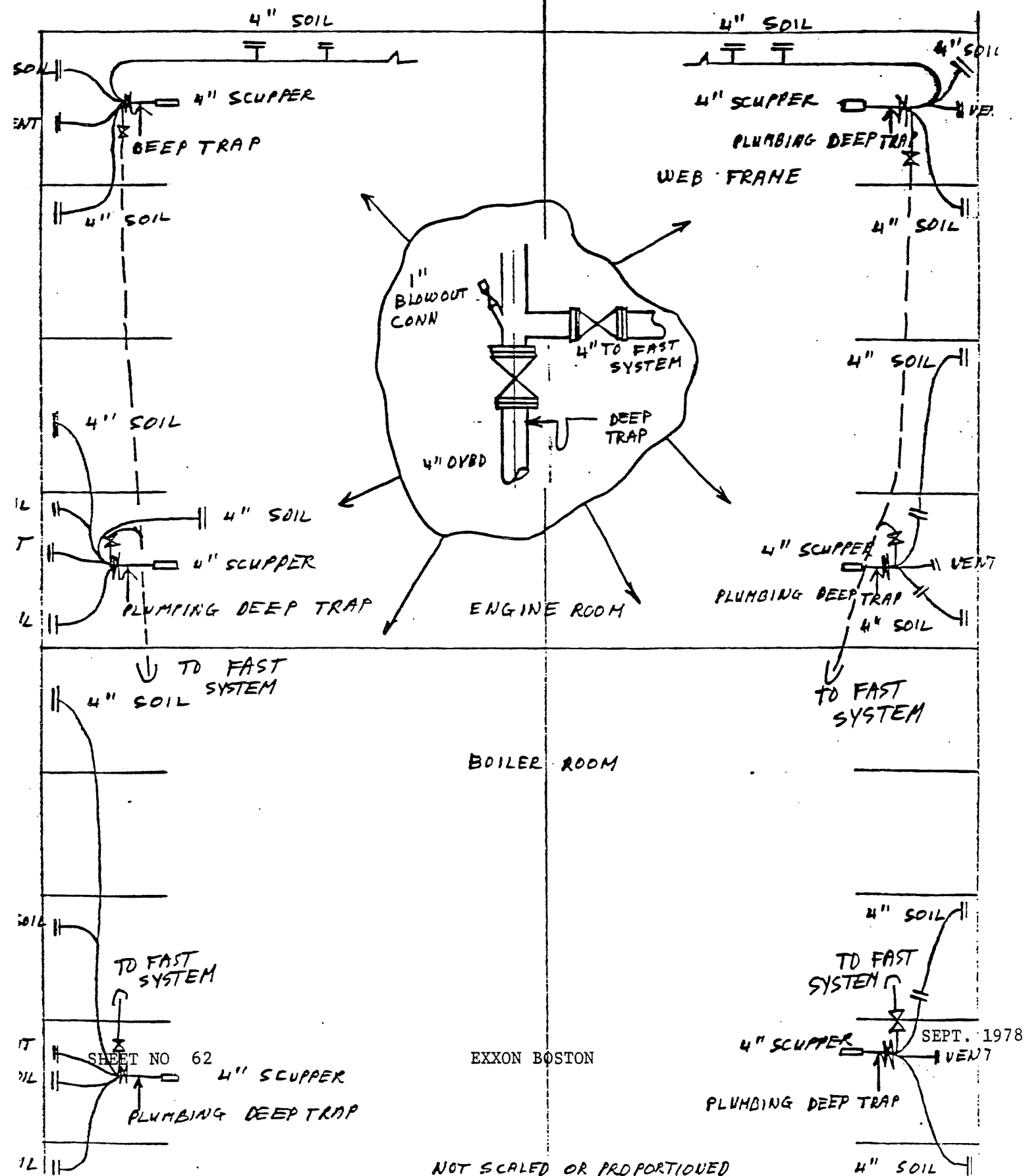
NOT SCALED OR PROPORTIONED

- AFTER HOUSE SANITARY SYSTEM

PORT FWD

K

STARBOARD FWD



EXXON HUNTINGTON - AFT HOUSE
FAST TREATMENT SYSTEM ORIENTATION

4" FROM ABOVE

3" FROM ABOVE

MEDIA
TANK
#1

TO SYSTEM

SHAFT

OVERFLOW TO #
2 TANK

FRAME

TREATMENT
SYSTEM
LOCATION
#2 TANK

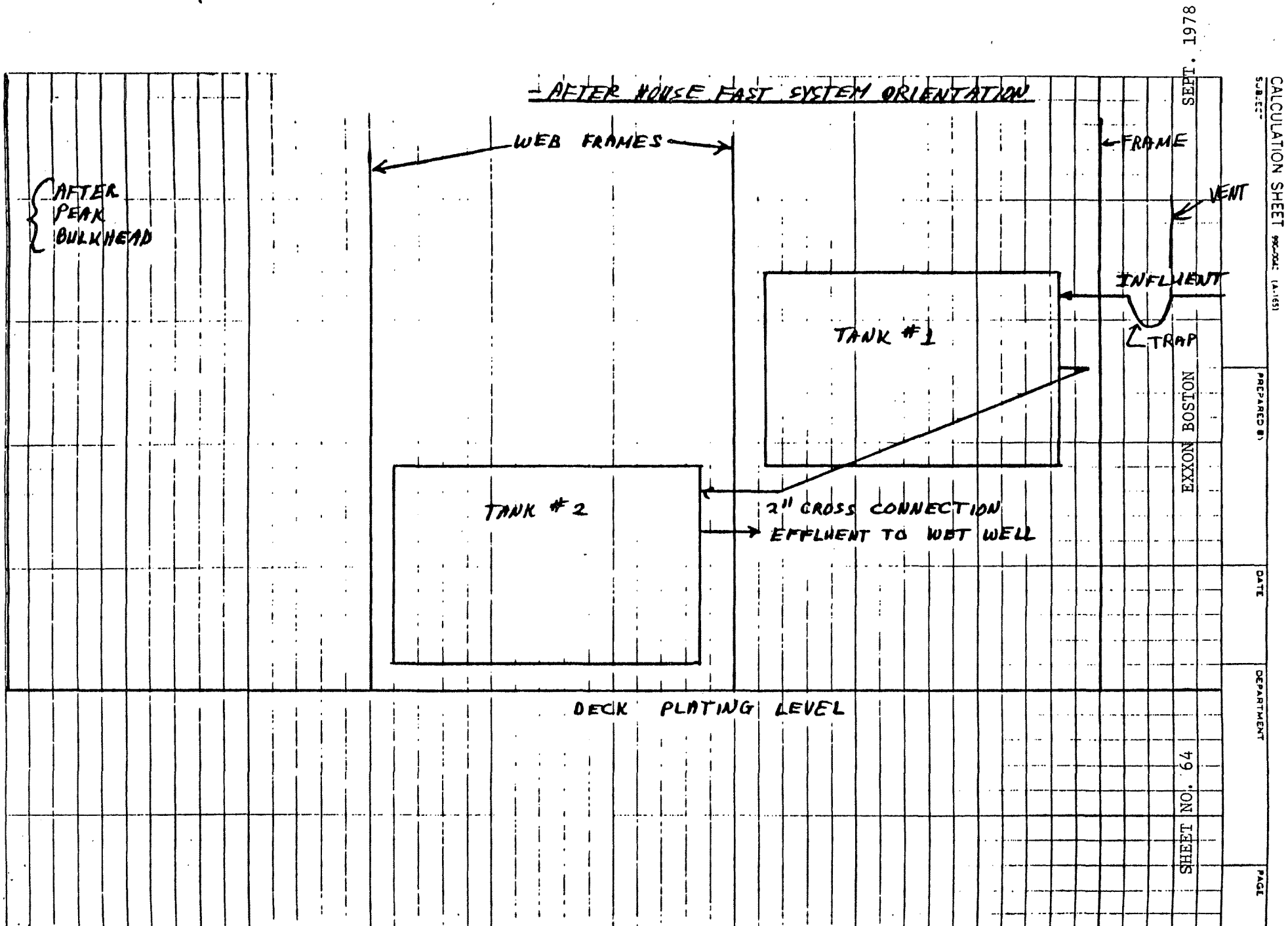
FRAME

SHEET NO. 63

EXXON BOSTON

SEPT. 1978

AFTER PEAK BULKHEAD





Marine Sewage Systems

Installation Instructions: M Series

EXXON BOSTON

Installation Instructions

For Models ~~6M, 9M, 13M and 18M~~ 26M

Contents:

Page 1.

General
Operation
Equipment Furnished
Labor & Materials Required,
but Not Furnished
Caution

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Soil Piping
Bypass
Trap
Trap Vent
Media Tank Vent

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Vent Piping (General)
Water Piping
Air Piping
Media Tank
Tablet Chlorinator
Wet Well

Page 4.

Discharge Pump
Blower
Blower Relief Valve
Electrical Equipment

Page 5.

Deck Connection
Gravity Flow
External Air Supply
High Level Alarm
Startup Checklist

Page 6.

Startup Procedure

General. Each M Series FAST system is a complete marine sewage plant in component form. The components can be located where space is available and then interconnected. Each component is fully assembled prior to shipment, and will pass through a 28" x 60" watertight door without disassembly. Components may be

SHEET NO. 65

oriented fore and aft

The most critical aspects of installations are piping and venting, so that the sewage will flow freely into and through the system. Read these instructions and the associated drawings carefully.

Each boat and installation is unique. If you have any questions, call your local distributor or St. Louis Ship. To assist you in installation we make available a qualified field representative for up to two (2) days at no cost to you, other than for transportation expenses (billed at cost).

Operation. As fresh sewage enters the media tank, an equal volume of purified water is displaced through the tablet chlorinator and into the wet well. Liquid level switches in the wet well operate the discharge pump. The blower runs continuously.

Equipment Furnished. Media tank, tablet chlorinator, wet well, discharge pump, blower, pump and blower motor starters, 45 lb. drum of chlorine tablets.

Special Note. The FAST ~~18M~~^{26M} differs from the other models in one respect. It uses two model ~~13M 9M~~ media tanks, connected in series rather than a single tank. The first media tank should be set about 6 inches higher than the second tank to insure gravity flow from the outlet of the first tank to the inlet of the second tank. This will permit the tanks to be located up to 10 feet apart. If greater spacing is desired, raise the first tank an additional 1/4 inch per additional foot of separation. Otherwise, all installation requirements are the same as for the other models.

Labor and Materials Required, but not furnished. Structural foundations, interconnecting piping and wiring.

Caution. Do not weld on the bodies of the media tank or wet well. Their interiors are coated with epoxy resin and the heat will destroy the coating. Also, protect the plastic parts of the tablet chlorinator from weld splatter during installation.

EXXON BOSTON

SEPT. 1978

EXX-MOR-010730

2

Soil Piping. Soil piping to the system must slope 1/4 inch per foot when the vessel is at its normal trim. This will insure adequate flow velocity and prevent deposition of sewage solids in the pipes.

Bypass. Provision should be made for direct overboard discharge of sewage, bypassing the FAST system. This will provide sanitary facilities for the crew in case of malfunction, and also permit bypassing at sea where treatment is not required.

The simplest method is a two valve gravity flow arrangement. ~~Ball valves are recommended.~~ Gate valves are acceptable so long as the stems are oriented upward to prevent clogging.

Trap. It is necessary to isolate the vessel soil piping from the sewage system with a water seal trap. Occasionally, detergent foam will form in the media tank and partially block the media tank vent, creating backpressure. The trap will prevent this backpressure from affecting operation of the toilets.

The minimum depth of the trap shall be not less than sixteen (16) inches, from the centerline of the outlet pipe to the centerline of the pipe at the bottom of the trap.

Note that the inlet to the trap is 1'-0" or more above the outlet. This 1'-0" drop corresponds to the expected worst case backpressure in the media tank vent. ~~If 1'-0" drop is not available,~~

When larger vent size is required, enlarge to the larger pipe size as close to the media tank as possible.

****Each ^{26M} media tank used in the ^{48M} is equipped with a $2\frac{3}{4}$ inch vent connection. These should be combined into a single vent of the size specified in the table as close to the media tanks as possible. - 5"**

The trap should be equipped with a 2 inch cleanout and fill connection at the top of the inlet pipe, and a 2 inch cleanout at the bottom.

Trap Vent. The upstream side of the trap should be equipped with a 2 inch vent to the exterior of the vessel. This will permit free flow of sewage in the soil pipes. ~~If the soil lines are adequately vented to atmosphere, this vent may not be required.~~ However, if the fixtures incorporate one way (check valve) air inlets, a separate trap vent will be required. The trap vent may be fabricated from ordinary black iron pipe.

Media Tank Vent. The media tank must be vented to the exterior of the vessel, and this vent must not be combined with the trap vent or any other soil line vent upstream of the trap.

The media tank vent should be fabricated from galvanized steel pipe or other material suitably protected against corrosion. ~~X~~ a flame screen is required (for inspected vessels only), the exterior termination of the vent should be fitted with a

3

pipe reducer, so that the opening and flame screen will be two pipe sizes larger than the vent pipe size. This will reduce the additional pressure drop due to the screen. The exterior termination of the vent should be located to permit removal and cleaning of the screen.

See Table 1 for minimum tank vent size.

Vent Piping (General). Vents must terminate not less than 10 feet from any ventilation air inlet, window used for ventilation, doorway normally used by personnel, or source of vapor ignition. Vent piping must slope not less than 1 inch per foot upward and away from the media tank or trap so that condensation will not accumulate in the vent. Vent runs should be as short as practicable.

For inspected vessels, the U. S. Coast Guard requires a flame screen on all vents.

Water Piping. Pump discharge piping should be 1-1/4 inch and all other water piping shall be 2 inch pipe size. The 2 inch pump suction piping should be reduced to 1-1/2 inch at the pump suction connection.

If media tank and wet well are set at the same deck level, maximum length of the spillover line from media tank to chlorinator to wet well is 30 feet. Piping should slope downward from the media tank at 1/4 inch per foot.

The run between the media tank outlet and chlorinator inlet must be equipped with a trap with centerline to centerline depth of sixteen (16) inches. No drop is needed. Inlet and outlet of the trap can be at the same level.

Note: In both water and air piping use unions to permit removal and maintenance of components.

Air Piping. Air piping from blower to media tank must be one (1) inch pipe size. ~~Acceptable~~

Media Tank. The media tank may be installed on a flat deck or on two longitudinal or three transverse frames with bearing areas at least 3 inches wide. The frames should pick up the six bolt holes predrilled on the tank baseplate. The tank may be secured in place with six 1/2 inch grade 5 bolts, ~~or with three, 3 inch long 3/16 inch fillet welds spaced along each long side of the baseplate.~~ The tank baseplate should be horizontal when the vessel is at its normal trim. Provide at least 2'-0" above the top of the tank for access.

Tablet Chlorinator. The tablet chlorinator is preassembled to a bracket for bulkhead mounting. It should be installed so that the notches in its bottom are at the downstream end. Tilt the bracket or shim the chlorinator so that it slopes 1/4 inch per foot (centerline of outlet connection about 1/2 inch below centerline of inlet connection). Be sure the tilt angle is such that water does not accumulate in the bottom of the chlorinator.

The chlorinator may be located at any point in the line between media tank and wet well, but must be downstream of the trap and not less than 2'-8" above the base of the wet well.

Provide at least 1'-0" access above the top of the feed tubes for their removal.

Wet Well. The wet well may be installed on a flat deck or on two frames with bearing areas at least 3 inches wide. The frames should pick up the four bolt holes predrilled on the tank baseplate. Secure with either four 1/2 inch grade 5 bolts or with two 3 inch long 3/16 inch fillet welds on each side. The tank baseplate should be horizontal when the vessel is at its normal trim.

4

Allow at least 1'-6" above the top of the tank for access.

Discharge Pump. The discharge pump should be operated in the flooded suction mode. Its base should be not more than 2'-0" above the baseplate of the wet well. If the discharge head is greater than 15 feet or if the discharge point may be submerged, install a check valve in the discharge line. The pump base should be tack welded to the deck. **Do not run the pump dry!**

If the pump is run backward, the rotor may unscrew and the pump will not deliver water. If this happens, disassemble the pump and reassemble the rotor and pump.

Blower. The blower assembly is preassembled to a bracket for bulkhead mounting. Install so that the silencer inlet will not pick up foreign objects from the deck, and with belt drive towards the bulkhead.

Make sure that the blower gear case has oil in it before starting. The fill plug is at the top of the gear case (opposite the drive end), the oil level plug is below it and just above the drain plug. Add SAE 40HD oil until it overflows from the oil level plug hole.

See Table 2 for standard sheave sizes.

Table 2.
M Series Sheave Sizes

FAST Model No. Motor Sheave Blower Sheave

26M 4.6 4.1

Blower Relief Valve. ~~The relief valve should be~~

The purpose of the relief valve is to protect the blower from damage due to overpressure. Make sure that the relief valve operates freely and is lubricated with machine oil.

Electrical Equipment. Motors and the pump starter control transformer can be connected for either 220/230 VAC or 440/460 VAC operation. (These motors are **not** suitable for 208 VAC operation. If 208 VAC operation is required, special motors are required.) Unless otherwise stated in the purchase order, the overload heater coils furnished will be for 440/460 VAC. Table 3 lists proper Cutler-Hammer part numbers.

Table 3.
Overload Heater Coil Part Numbers

Line Voltage	Blower Starter	Pump Starter
<i>440/460 VAC</i>	<i>H1025</i>	<i>H1023</i>

The pump starter incorporates a line disconnect which can break all current to both motors. It should be located in sight of the motors. The pump starter also incorporates a fused control transformer to produce 110 VAC for the pump pilot circuit.

Electrical service required is 3.5 KVA. The branch circuit feeding the motor starters should be protected by a 20 amp circuit breaker. Cables should be bronze armored marine type, TTIB-4 and DTIB-4 as applicable. Junction boxes should be watertight, and cables should enter starter enclosures at the bottom. In running cables and locating cable supports *do not weld on body of media tank or wet well.*

The liquid level switch on the wet well incorporates 3 independent sets of contacts: pump off (2 red wires), pump on (2 yellow wires) and high level (2 blue wires). ~~If the high level~~

Startup Checklist. Before startup, check these items:

1. Soil piping leading to FAST system must be sloped at 1/4 inch per foot and vented to vessel exterior upstream of the trap.
2. Media tank vent and drop into trap must be in accordance with Table 1 in *Trap* section of this instruction.
3. Media tank vent must not be combined with any other vent.
4. Horizontal vent runs must slope upward and away from media tank.
5. Vents must not terminate within 10 feet of weather deck, ventilation air inlets, windows or doors used for ventilation, doorways normally used by personnel, or sources of vapor ignition.
6. If flame screen is used on media tank vent, it must be two (2) full pipe sizes larger than size of vent pipe.
7. Media tank base must be at same level as, or higher than, wet well base.
8. Gravity flow lines from media tank to chlorinator to wet well to overboard (if applicable) must slope 1/4 inch per foot.
9. Grease bearings on blower drive end and on both motors before startup.
10. Blower must be filled with oil and be equipped with proper sheaves, as per Table 2.

External Air Supply. If specified in the purchase order, the system will be furnished less blower, but will incorporate a pressure regulator and orifice plate for flow regulation. Connect to the external air supply with a 1 inch line and provide a separate shutoff valve upstream of the regulator. Set regulator to 3.5 PSI.

6

12. Blower and pump starters must be equipped with proper overload heater coils, and each coil should be installed with pointed end up.
13. Chlorinator must tilt 1/4 inch per foot, and the downstream tube must be charged with chlorine tablets. Make sure tablets lie flat in feed tubes, and that water does not stand in chlorinator when there is no flow.
14. Does vessel have operating instruction manual?

Startup Procedure.

1. Set up for automatic operation and turn on blower (air lift operation).
2. Fill media tank with water and leave water running to check automatic operation of pump. Turn off water.
3. Close overboard bypass and allow sewage to enter media tank.
4. Flush all toilets to check for proper operation. If flushing is slow, check soil pipe venting.
5. Instruct vessel personnel in operation of system.

EAST
SEWAGE SYSTEMS



ST. LOUIS SHIP

DIVISION OF POTT INDUSTRIES INC
611 EAST MARCEAU STREET, ST. LOUIS MO 63111

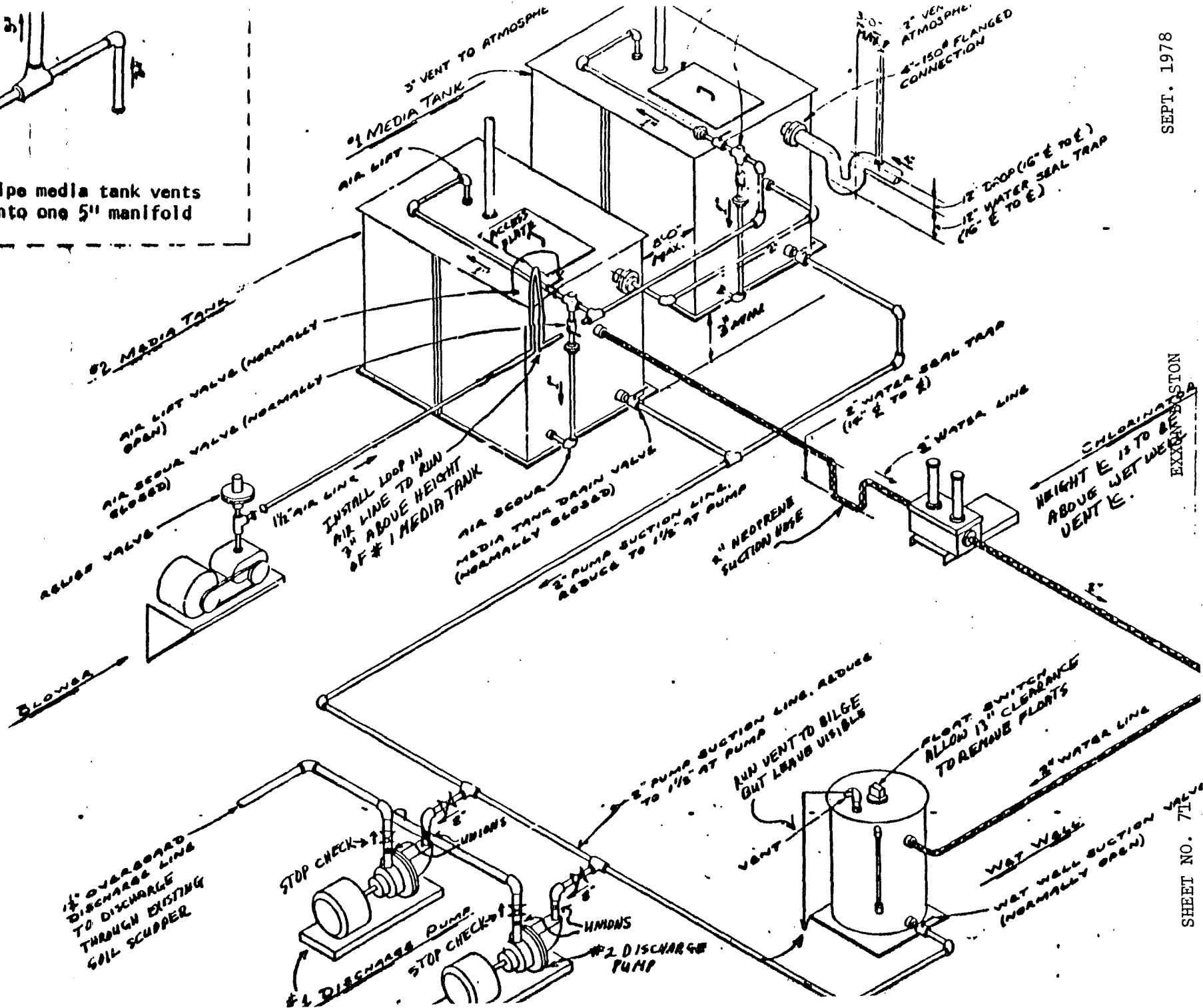


EXHIBIT STON

SHEET NO. 71

EXX-MOR-010736

Installation Notes:

- Media tanks are to be mounted fore and aft. #1 Media tank forward of #2.
- Wet well base must be at least 12" lower than media tank base #2.
- Locate chlorinator for 1/4" drop per foot from 2" media tank spillover to 2" chlorinator inlet.
- Set chlorinator so that notches at bottom of box are under downstream tube. Shim chlorinator or tilt base for 1/4" drop per foot.
- There is no high level alarm with this system.

Piping:

- Water and soil lines to drop 1/4" per foot.
- Vent media tank and trap separately to exterior of vessel on stack deck. Vents to terminate not less than 10 feet above weather deck in gooseneck. Vents to terminate not less than 10 feet from ventilation inlets, doors, windows, etc. Horizontal vent runs to slope not less than 1 inch per foot.

Piping Materials:

ir:galvanized schedule 40.
ump suction:schedule 80 Galv.
on-suction water:schedule 80 Galv.
ent:galvanized schedule 40.
eophrene hose - identified by ~~xxx~~ on drawing.

DIMENSIONS AND WEIGHTS

<u>UNIT</u>	<u>LENGTH</u>	<u>WIDTH</u>	<u>HEIGHT</u>	<u>DRY WT.(LB)</u>	<u>OPERATING WT. (LB)</u>
edia Tank	6'-6 1/4"	2-3 3/4"	4'-4"	1450	3800
et Well	2'-3"	2'-3"	4'-7"	450	1200
lower	2'-0"	1'-0"	3'-0"	180	180
ischarge Pump	2'-6"	0'-11"	0'-10"	120	120
hlorinator	2'-0"	1'-3"	2'-4"	50	60

Access

edia tank	Top and one end	1'-6"
et well	Top 2'0" one side	1'6"
hlorinator	Top 2'0" above top of feed tubes	

EXXON BOSTON - 1978 SHIPYARD SPECIFICATIONS

SEWAGE CONVERSION OWNER FURNISHED MATERIALS

. AMIDSHIPS

- 2 - No. 6353 - 3/8 GG-22 Stainless steel spraying nozzles.
- 2 - Gems DeLaval Fabri Level Kits (2 level switches per kit).
- 4 - Gems Safe - Paks

. AFTER HOUSE

- 1 - Complete Fast Model 26 M Sewage system consisting of:
 - 2 - 13 M Media Tanks
 - 1 - Wet Well
 - 1 - Chlorinator
 - 1 - Blower, complete with motor, base, silencer
 - 2 - Pumps with motors
 - 1 - Combination starter
 - 45# - Sanuril Tablets
 - 1 - Pump Rebuild Kit
 - 1 - Spare Blower
 - 1 - Spare Vee Belt

GAT:bjc
7/25/78

EXXON BOSTON - 1978 SHIPYARD SPECIFICATIONS

III. Cargo Manifold Modification

Provide labor and material to modify the port and starboard cargo manifolds in accordance with the attached sketch. Only lines A, B, the port forward stripper, and the starboard forward bunker line are affected. Spacing is to be as follows:

C to B₂ 6'
B₂ to Stripper (Bunker) 4'
Stripper (Bunker) to A₂ 2'

Remove four spool reduction pieces (A and B, port and starboard) and save for replacement. Remove the line extensions (A and B, port and starboard) and fabricate new extensions dimensioned as sketched. Each new line is to be properly supported and tied to the existing stripper line. Replace the spool reduction pieces.

Fabricate and install extensions for the 6" stripper line and the 8" bunker line. Support as needed.

Furnish and install a 3' section to the forward side of the existing collection pan and hose rub rail, port and starboard. Support these extensions as needed.

Blast all new sections of pipe, supports, etc. and coat in an approved manner.

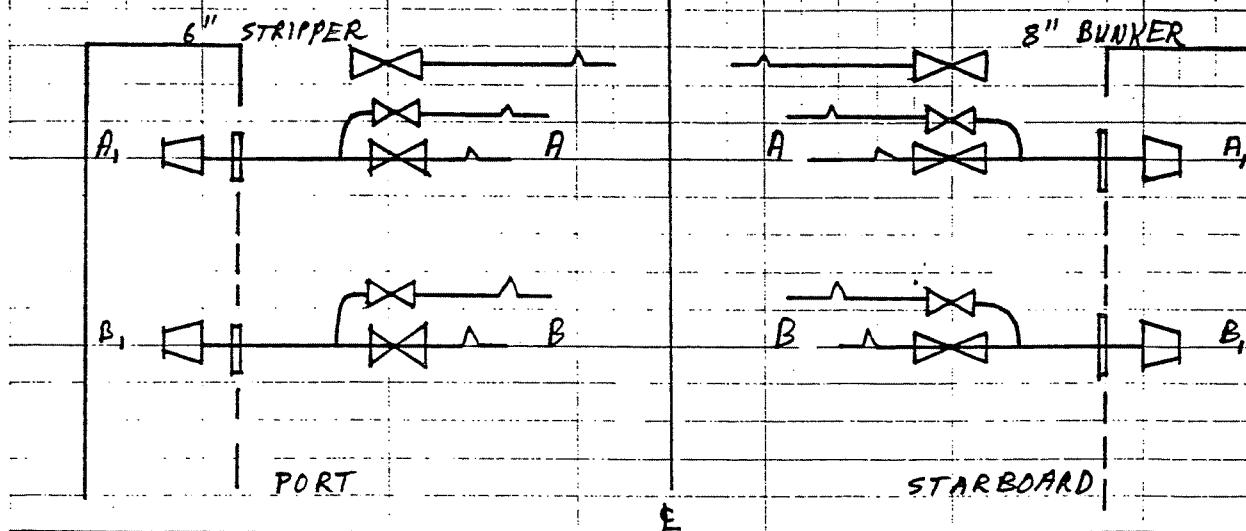
Provide engineering services to develop details, produce drawings, and obtain approvals from USCG, ABS, owners and others as required. All final drawings and work are to have approval from all concerned. After completion of all work, prove to satisfaction of owners and others as required.

MANIFOLD MODIFICATION-
EXXON BOSTON

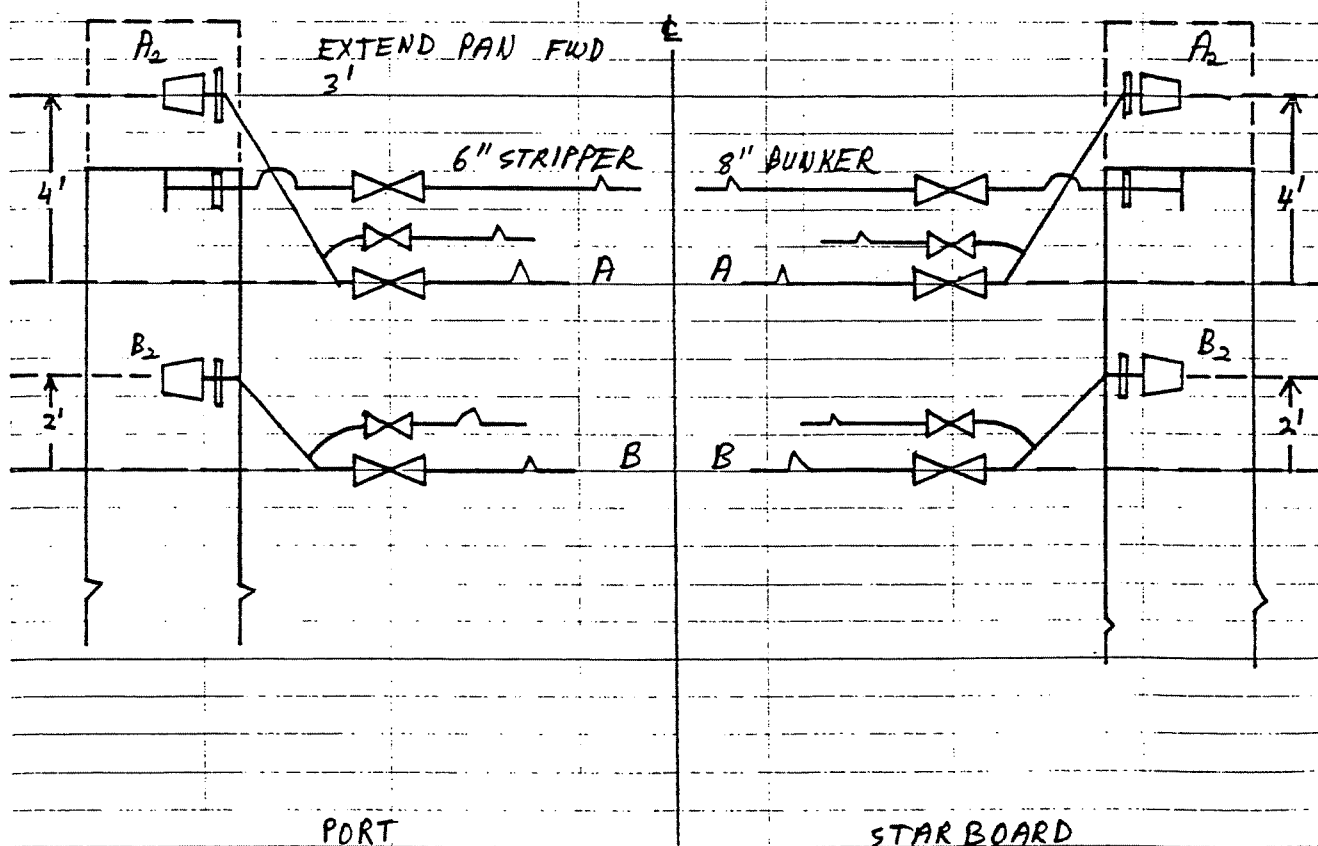
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EXISTING



MODIFICATION



87. EXXON BOSTON STEERING MODIFICATION

The intent of this modification is to provide the wheelhouse with the capability to start/stop both of the main steering pumps and to switch the steering system six-way valve between the port/starboard steering pumps.

The steering manufacturer, Hyde Products, Inc., will provide all the electrical components (less cable) and will provide and mount the actuator on the six-way valve. Shipyard is to provide cable and install cable, remove and reinstall six-way valve, and install wiring for valve actuator and electrical components in accordance with wiring diagram supplied by Hyde.

Scope of shipyard work to be as follows:

Remove six-way valve from steering system and deliver to Hyde representatives. Temporarily blank pipe connections to steering system. Provide and install a type MSCA-19 cable using existing cable runs and conduit where possible between the steering gear room and wheelhouse. Leave enough slack at each end to terminate cable at the steering room/wheelhouse control panels. Mount the Hyde furnished control panels in the steering room and wheelhouse. Exact locations to be as specified by Exxon representative. Hyde Products will modify the six-way valve and mount electric actuator with housing on the six-way valve. Shipyard reinstall the six-way valve in the steering system. Shipyard wire the actuator and bridge control panel into the existing system in accordance with the Hyde wiring diagrams.

88. SPERRY SPEED LOG - BETTERMENT 46

- A. Provide engineering services to produce drawings and obtain approvals from USCG, ABS and Owners as required. See drawing 10569.
- B. Furnish labor and material to install an Owner furnished Sperry SRD-301 speed log seachest in the forepeak tank. Location of seachest to be determined in the field by Owner's Representative. Location to be between frame 142 and 143; however, seachest must be located on flat section of bottom hull.

Necessary to burn one (1) approximately 6" diameter hole in shell plate forward of frame 142 and weld in boss from seachest kit while on dry-dock. Shipham valve then installed.

In order to perform above it was necessary to pull the docking plug from the forepeak tank and reinstall when tank was dry.

- C. Furnish and install Owner and manufacturer approved cable from the fore-castle to the wheelhouse chart room to facilitate later installation of speed log components 350' of TTRSA 16. Cable run should make maximum use of existing cableways where possible and exposed sections of cable should be run in suitable bulkhead penetrations, cable hangers, etc. for installations to allow proper wiring and location of speed log components. Necessary to remove seven (7) bolted cover plates from the forward cat-walk wireway in order to accomplish above. Also removed twelve (12) overhead panels. See Item #279 in connection with wireways.
- D. Fabricate and install the following mounting brackets by bolting to the bulkheads in locations as directed by the Owner's Representative. Total of three (3) brackets.

Electronic Receiver Unit - One (1) 1/4" X 1" X 20" F.B. two (2) 1/4" X 1" X 12" F.B.

Transceiver unit - two (2) 1/4" X 2" X 12" FB.

Display unit - One (1) 1/8" X 1" X 9" FB, one (1) 1/8" X 1" X 6" FB.

- E. Take delivery of the transducer, transceiver, digital display unit and the wiring from the transducer to the transceiver. Install the transducer on the seachest kit 3" valve in the forepeak tank and run the wiring to the transceiver mounted in the foc'sle. All wiring in the forepeak was run in 1-1/4" extra heavy galv. pipe approximately 80' long. Make one (1) deck penetration, with stuffing tube, thru main deck in foc'sle. Connect wiring to the transducer and transceiver in an approved manner. Mount the digital display unit in the bridge and make all electrical connections.
- F. Take delivery of one (1) electronics receiver unit and mount in the gyro room forward bulkhead. Make all necessary electrical connections.

See JSI Drawings #10566
10574
10569

89. COLLISION AVOIDANCE SYSTEM (BETTERMENT ITEM)

Furnish labor and material to make the following preparations for installation of an Owner furnished Sperry Collision Avoidance system to the MK16 Radar.

- A. Provide engineering service to produce drawings and obtain approvals from USCG, ABS and Owners as required. After completion of installation all revisions or modifications are to be obtained and approved in final drawing. See drawing 10569.
- B. Relocate Sperry MK-16 radar display unit and sun screen curtain from the starboard side of the wheelhouse to the port side of the wheelhouse in accordance with Owner furnished location diagram.

Fabricate and install a new foundation for the radar display unit. Necessary to remove deck tile in way of same. Material used for foundation: Two (2) 3/8" X 4" X 3" X 19" angle, one (1) 3/8" X 19" X 25" plate, four (4) 3/8" X 2-1/2" studs. New foundation base of oak was installed after the unit was moved. Used two (2) pieces 3" X 4" X 20" and two (2) pieces 2" X 4" X 26" of oak.

Crop out and scrap the existing radar display unit foundation. Necessary to insert the deck in approximately six (6) places where wiring was removed.

Disconnect all wiring from the radar display unit. Reroute the wiring, install necessary deck penetrations and reconnect to the display unit in the new location. Necessary to make removals of several overhead panels in order to accomplish above.

A total of approximately 20' of 10" wireway and 10' of 6" wireway was run for this item and item No.88 Sperry Speed Log.

Disconnect and scrap the existing sun screen, Fabricate and install one (1) shaped curtain rod from 3/4" X 20' alum pipe to fit around the collision avoidance units. Mounted from the overhead with necessary brackets. Install one (1) 10" X 20' aluminum light shield around the top of the curtain. Necessary to paint the overhead in way of above with flat black paint. Fabricate and install two (2) 10' X 4" section of curtains with eyes and curtain hooks.

- C. Furnish and install Owner and manufacturer approved cable to facilitate wiring hookup of Owner furnished equipment at a later date. Location of equipment components shown on Owner sketch.

Run wiring to the location of the following equipment and dead end as directed.

Sat/Nav	Forward bulkhead in chart room
Loran C	Forward bulkhead in chart room
CAS computer	Aft bulkhead in chart room
CRT display	Forward bulkhead in chart room
CAS display	Port side of wheel house

COLLISION AVOIDANCE SYSTEM (BETTERMENT ITEM) (Continued)

Installed one (1) twenty (20) wire junction box on the chart room forward bulkhead.

The following cable furnished and installed by the shipyard.

65' of TTSA - 10
130' of MSCA - 7
50' of TSGA - 4

- D. Propose an appropriate power source wiring system for collision avoidance equipment and obtain Owner and Regulatory Body approval as required.

Furnish and install approved electrical power wiring for collision avoidance equipment. See drawing #10569.

- E. Investigate and propose structural changes and/or support modifications for Owner furnished equipment. Obtain Owner approval and furnish and install approved foundations and support structures.

The following foundations and shelves installed:

CAS Display - Foundation

Two (2) 3/8" X 4" X 3" 19" angles
One (1) 3/8" X 19" X 25" plate, drilled and tap for studs
Six (6) 3/8" X 2-1/2" studs

Fabricate one (1) 12" X 24" X 24" X 1/2" plywood box to cover above foundation until unit is installed.

CAS Computer - Foundation

Two (2) 3/8" X 4" X 3" X 30" angles, drilled for six (6) 5/8" dia. holes.

Necessary to scribe in to deck so that the foundation is level.

SAT/NAV and Loran C - Shelves

Three (3) shelves, 21" X 16" X 3/16" sheet metal.
Two (2) braces, 1/8" X 2" X 13-3/4"
Four (4) corner posts, 1/4" X 2" X 60" F.B.

Remove the existing shelf for the Loran "A" and relocated on above new shelf.

CRT Display - Shelf

One (1) shelf, 3/16" X 18" X 15"
Two (2) braces, 1/8" X 2" X 12"
One (1) post, 1/8" X 1" X 1" X 36"

COLLISION AVOIDANCE SYSTEM - (BETTERMENT ITEM) (Continued)

See Drawing 10592, sheet 1 and 2

F. Renew all tile removed in way of foundations installation and removal.

PLEASE NOTE:

THE CAS IS NOT TO BE INTEGRATED TO THE RAYTHEON RADAR

90. FORCED DRAFT FANS

DO NOT START UNTIL AUTHORIZED BY OWNERS REPRESENTATIVE

- A. Open for survey port and starboard forced draft fans. Open up, clean and examine four (4) pedestal bearings and renew bearings as required with owner supplied spares. Check casing clearance and examine fan/motor coupling. Close up unit in good order, test and prove in good operating condition. Clean all internal surfaces prior to closing up units. Check amount of float between bearing and housing casing.
- B. Remove fan ashore, clean, check for trueness, balance unit, return to vessel, and reinstall and properly realign.

91. MAIN CIRCULATOR CONTROLLER - 806

DO NOT START UNTIL AUTHORIZED BY OWNERS REPRESENTATIVE

FURNISH NECESSARY LABOR, EQUIPMENT AND MATERIAL REQUIRED TO COMPLETE THE FOLLOWING:

Clean, dress all contacts, adjust, tighten all connections, renew defective contacts and prove in good operating condition. Check out and clean resistor banks and controller for main circulator pump motor.

92. MAIN CIRCULATING PUMP - 211

DO NOT START UNTIL AUTHORIZED BY OWNERS REPRESENTATIVE

Open up main circulating pump for examination and ABS survey. Disconnect and remove impeller assembly from casing, after survey, reinstall renewing casing gasket, test and prove in good working condition. Replace removals in good order.