

ATTACHMENT A

**Scope of Overhaul and Refurbishment Work for
Existing Main Dewatering Pumps
(MDP-1 and MDP-2)
Pump Well #3**



Public Works Department, Maine

RE: DD #3 Pumpwell Repairs
Specification for Overhaul of MDPs - **ATTACHMENT A**
eProjects No. 1332591

date: 25 November 2014, Revised 29 December 2014, 15 January 2015, 21 January 2015

I. **Background** – This document outlines the requirements for overhaul of Main Dewatering Pumps (MDPs) in the Dry Dock #3 Pumpwell.

II. **Scope:**

A. **General**

1. Pumps are by Johnston Pump Company, Brookshire, Texas.
2. Type: Mixed flow, oil lubricated, single stage vertical turbines.
 - a) S/N 98JA1307-A-B
 - b) Installation date was May 1999, Customer
 - c) Nominal 30,000 gpm at 28 feet , Seawater Service
3. Motors are by Continental Electric Co., Inc., Newark, New Jersey
 - a) SNV 686HSP, 300 HP, 460Volts, 3 phase, 600 RPM
 - b) Hollow shaft, Open Drip Proof type
 - c) Motors were installed, new with the above the pumps
4. Original Supplier/Installing Contractor: The Chappy Corporation
5. Approximate weights (per unit)
 - a) Driver 4800 pounds
 - b) Discharge Head Assembly 5000 pounds
 - c) Column Assembly 3700 pounds
 - d) Bowl Assembly 2750 pounds
 - e) Total 16,250 pounds
6. Comply with all procedures in the Service Manual for pumps and motors, 73 pages, attached (81.8MB pdf), Attachment B, in all operations described below.
7. Qualifications of pump and motor subcontractor for removals, transport, and reinstallation
 - a) See Section 43 21 39.00 20 part 1.5.1
8. Qualifications of Service and Repair Facilities:
 - a) Common - See Section 43 21 39.00 20 part 1.5.1
 - b) Motors - See Section 43 21 39.00 20 part 1.5.1
 - c) Pumps - See Section 43 21 39.00 20 part 1.5.1
9. Certified Millwright required –
 - a) All operations for the removal, disassembly, re-assembly, and re-installation of the MDPs, including rigging and hoisting, shall be under the direct, on-site supervision of a Certified Industrial Millwright, with Level 5 Assessment and Performance Verification Credentials as established by NCCER (formerly the National Center for Construction Education and Research), or approved equivalent qualifications.
 - b) Submit qualifications for review at least 45 days prior to the start of work.

B. Common Work

1. Work must be sequenced; only one (1) MDP can be out of service at any time.
2. Both pumps must be present, in service and in operating condition not less than two weeks prior to any scheduled undocking/docking evolution. Coordinate work with Contracting Officer.
3. Remove hatch and provide barricades plus weather protection while hatch is open.
 - a) Prompt Replacement of covers/hatches - Hatch covers shall be temporarily replaced and sealed not more than one day after the removal or re-installation.
4. Remove concrete from the floor at Level 1 as required to access and remove lower bolts at connection to the bell that is cast into the floor.
5. Obtain the required Outage and secure valves. Lock Out/Tag Out (LOTO) of power pumping, controls and alarms
6. Remove hatch above the pump unit to be overhauled.
7. Rig, lift, remove and ship, separating components as required.
8. Prepare units for storage and shipment, including cleaning, closure plates, corrosion prevention, safety blocks, etc.
9. Clean and recoat cast-in suction bells that remain in place
10. Clean and recoat shaft guards
11. Upon overhaul of pump and motor, reinstall in place.
 - a) Provide millwright services to assure that units are aligned, concentric and without stress from piping and valve connections, etc.
12. Provide workmanlike repair of concrete on the floor at Level 1 to provide long term access to lower bolt circle. Comply with Concrete Repair specifications.
13. Reinstall and permanently re-seal the hatch cover and repeat for second unit.
14. Testing –
 - a) Test motors and pumps in the shop, individually, before return shipment and re-assembly.
 - b) Provide full reports on Shop Tests for review and approval prior to sending components back to PNSY.
 - c) Test assembled units as specified in Section 43 21 39.00 20 part 3.3.
15. Training – Provide operation and maintenance training on overhauled pumps and motors.
 - a) Training to be performed by skilled trainer, knowledgeable in the pump and/or motor.
 - b) Training to be provided on two separate occasions, not less than sixty (60) minutes each.
16. eOMSI –
 - a) Provide bound Operations and Maintenance (O&M) manuals in three copies as required by Section 01 78 23, OPERATION AND MAINTENANCE MANUALS outlining the work that was performed, parts furnished, including finishes, all test results, and O&M directions, troubleshooting information, etc.
 - b) Provide digital copies of the above cited data, in a format consistent with the eOMSI requirements for this project as they are outlined in Section 01 78 24.00 20

C. Motors

1. Planned Work

- a) Remove and deliver to approved motor service center for rehabilitation work (See Common Work above)
- b) Visual inspection and condition report to be performed by vendor and Portsmouth Naval Shipyard (PNSY) Code 984 concurrently. Provide minimum two weeks of notice to PNSY Code 984 through the Contracting Officer.
- c) Disassemble, clean and dimensionally check all shaft runouts and bearings, brush holders, anti-reverse ratchets and other parts
- d) Steam clean rotor and stator windings
- e) Bake the windings to dry
- f) Visually inspect the motor components for defects
- g) Perform electrical tests on rotor and windings, including a Megger test and polarization index test (IEEE Standard No. 43-2000) to determine the condition of the insulation
- h) Reinsulate rotor and field windings, dip and bake
- i) Service slip rings and brush holders
- j) Service anti-reverse ratchet
- k) Service and/or replace RTUs (thermocouples) in windings and bearings.
- l) Replace all threaded fasteners, loose keys, etc.
- m) Dynamically rebalance
- n) Reassemble with new bearings and brushes, refinish exterior, and test.
- o) Provide engraved label plate indicating status of service performed, vendor and date.
- p) Reinstall motor, connect electrically and mechanically, adjust, lubricate and test with rehabilitated pump assembly.

2. Non-Routine Work

- a) Rewind motor if it fails electrical tests
- b) Replace slip rings if they cannot be serviced
- c) Rework journals
- d) Rework bearing housings
- e) Other service work including repair and replacement as required based on results of disassembly and inspections

D. Pumps

1. Planned Work

- a) Remove and deliver to approved motor service center for rehabilitation work (See Common Work above)
- b) Fully disassemble, clean, inspect and dimensionally check all shaft runouts and surface conditions, couplings and bearings, interior and exterior coatings.
- c) Visual inspection and condition report to be performed by vendor and PNSY Code 984 concurrently.
- d) As a minimum all parts will be cleaned and de-burred as part of the overhaul.

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- e) Replace all bearings – Bowl, Line shaft and shaft sealing assembly types
 - f) Replace all wear rings and packings
 - g) Replace all packing, seals, O-rings, slingers, shims, thrust rings
 - h) Referring to the O&M Manual, the following parts shall be replaced at a minimum: packing, pc-17; lip seal, pc-32; bearings, pc-16, 25, 30 & 31
 - i) Replace all gaskets, threaded fasteners (bolts, studs, washers and nuts), loose keys, etc.
 - j) Touch up all interior finishes with compatible coating applied in strict compliance with the manufacturer's recommendations.
 - k) Flush, clean and inspect oil lubrication system including solenoids and controls
 - l) Service Air relief valves
 - m) Dynamically rebalance
 - n) Reassemble, refinish exterior, and test.
 - o) Provide engraved label plate indicating status of service performed, vendor and date.
 - p) Reinstall pump, connect piping and shafting mechanically, adjust, lubricate and test with rehabilitated motor assembly.

2. Non-Routine Work

- a) Rework suction bell in place (Cast into concrete slab at lowest level of pumpwell)
- b) Replace suction/inter bowl liner if it is severely eroded (Held in place by press fit and machine screws)
- c) Replace shafts and couplings
- d) Rework or replace impeller
- e) Replace columns, if severely eroded
- f) Rework motor mounting for frame alignment
- g) Other service work including repair and replacement as required based on results of disassembly and inspections

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