SECTION 11651 - SUPPLEMENTAL

SUMP PUMPS

PART 1 - GENERAL

1.1 SCOPE.

A. This Section covers heavy duty submersible sump pumps used to pump water out of valve vaults, meter pits and building sumps.

1.2 GENERAL.

1.2.01 Governing Standards. Unless otherwise specified, the work of this Section shall conform to the applicable portions of the following Standard Specifications:

AFBMA – Anti-Friction Bearings Manufacturers Association

ANSI – American National Standards Institute

ASTM – American Society for Testing and Materials

HI USA – Hydraulics Institute USA

NEMA – National Electrical Manufacturers Association

1.3 QUALITY ASSURANCE. Each pump casing shall be hydrostatically tested to 1.5 times maximum shut-off pressure by manufacturer. Each assembled pump shall be fully tested on water and have curves plotted to determine the rated capacity of each pump in accordance with the standard of HI USA.

1.4 SUBMITTALS.

1.4.01 Drawings and Data: Submit manufacturer's product data. This data should be included, unless otherwise directed, in a schedule shown elsewhere. The data and specifications for each unit shall include, but not be limited to, the following:

Name of manufacturer

Type and model

Rotative speed

Size of suction nozzle

Size of discharge nozzle

Net weight of pump

Shop drawings showing all system components and equipment in elevation and section

Submit shop drawings detailing installation, wiring, and control. Drawings shall also show details of anchoring and identify type, length, and diameter of anchors to be used. Submit Control Panel layout drawings showing details of all panel components, including ladder schematics, wiring diagrams and manufacturer's details and catalog cut sheets.

Submit Operation and Maintenance Manual, including parts lists, control diagrams in ladder format, spare parts listing and recommended schedule of inspection, cleaning and lubrication. Include manufacturer's recommended lubricants.

1.5 DELIVERY, STORAGE AND HANDLING. The Contractor shall transport and store all material and equipment in a manner to eliminate the possibility of damage, breakage, or chipping.

1.6 WARRANTY. The pump manufacturer shall warrant the units being supplied to the Owner against defects in workmanship and material for a period of 1-1/2 years from the date of acceptance by Owner.

PART 2 – PRODUCTS

2.1 SERVICE CONDITIONS. Sump pumps shall be used to remove potable and storm water and other water-based liquids as indicated on the drawings.

2.2 PERFORMANCE AND BASIS OF DESIGN REQUIREMENTS. Each pumping unit shall be designed for the operating conditions indicated on the drawings and below. Minimum hydrostatic test pressure shall be 1.5 times shutoff head of 30 feet plus maximum suction pressure.

Quantity = 25 pumps (Simplex type, one per sump)
Capacity = 600 gpm
Rated Head = 40 ft
Minimum Pump Efficiency = 60%
Motor = 3 HP
Voltage / Phase = 480V / 3 phase

Discharge Nozzle = 4-inch. Note: Contractor responsible for confirming existing discharge sizes and providing all connecting fittings (if needed) to existing discharge piping.

Pump performance shall be stable and free from cavitation and noise throughout the specified operating head range at design suction submergences. Each pumping unit shall be designed so that reverse rotation due to reverse flow will not cause damage to any component.

2.3 MANUFACTURERS.

A. ITT-Flygt (Model CP3085.182)
B. Hydromatic
C. Barnes.

The manufacturers shall be limited as indicated without exceptions.

2.4 PUMP CONSTRUCTION. Casing assembly shall be high strength cast iron, ASTM A48-76 No. 40B. The impeller shall be multi-vane open type. The interior water passages shall have uniform sections and smooth surfaces and shall be free from cracks and porosity. Shaft shall be stainless steel. Pump shall have upper and lower heavy duty ball bearings and tungsten carbide / carbon seals both permanently lubricated in an oil bath.

2.5 MOTORS. Motor shall be Class F with a maximum temperature of 310 degrees F (155 degrees C) and with dry running capability. Motor shall be permanently lubricated for extended service life. Also see Master Specification Section 16220, General Purpose Induction Motors.

2.6 CONTROLS. The sump pump shall be furnished with a NEMA 4X local control panel incorporating a magnetic-only adjustable circuit breaker type disconnect with overload and phase failure protection, and a NEMA rated motor starter with thermal overload protection. All pilot devices shall be transformer type, LED, 1-1/6 inch (30 mm), oil-tight type. Relays should be 3 PDT, 1.5 ampere, 480 VAC rated. All wiring shall be terminated in pressure type terminal strips. All internal panel wiring shall be tagged with a unique wire number, coded to the approved panel drawings. A 480 volt control power transformer with one secondary lead fused and the other grounded shall also be provided.

The sump pump shall have a control system consisting of three mechanical float switches located inside sealed, double walled NEMA type 6 floats of rigid plastic with a cable molded onto the end. The pump control and alarm mechanical float switch assemblies shall be furnished with 20 foot (6 m) cables to be hardwired to the local control panel, a support pipe of compatible material, support brackets, and gas-tight cable clamps.

The local control panel shall include, but shall not be limited to, the following:

Power ON/OFF selector switch

H/O/A selector switch

Alarm Reset pushbuttons

"Running" pilot light (red), "Off" pilot light (green), "Power On" pilot light (white), "High Sump Level Alarm" pilot light (amber)

Elapsed Time Meter

Duplex receptacle

Terminal Strip

Normally closed contacts pre-wired to terminals for external connections to others corresponding to the following:

"Sump Pump General Failure"

"Sump Pump Running"

"High Sump Level"

The first high level switch will start the sump pump. The second high level switch will alarm if the liquid level continues to rise. The low level switch will shut down the sump pump.

2.7 SPARE PUMPS. Provide two complete spare pump/motor (new).

- (4) Complete bearing sets
- (4) Seals / O-rings
- (4) Impellers
- (4) Wearing Rings

2.8 NOISE LEVEL. Noise level of pump/motor shall not exceed 80Db at a distance of five (5) feet.

PART 3 – EXECUTION

3.1 INSPECTION. Examine bases and verify size of base and anchor bolt positioning. Rectify conditions detrimental to the proper and timely completion of the

work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable for proper positioning, alignment and anchorage.

3.2 INSTALLATION. Each pumping unit shall be beveled, plumbed, aligned, and wedged into position to fit connection piping. Installation procedures shall be as recommended by the pump manufacturer and the Hydraulic Institute Standards, and as required herein.

3.3 SHOP PERFORMANCE TEST.

A. The engineer shall be given (4) weeks notice of all shop test in order that arrangement may be made for his representatives to be present. The shop test for the first two pumps shall be witnessed by the Owner and/or Owners representative.

B. Pumps having efficiencies less than the ratings as specified in Article 2.2 shall not be considered, the manufacture shall make all necessary remedies to the equipment, if any, at no extra cost to DWSD.

C. The manufacture shall furnish certified copies of all test reports to the engineer.

D. The manufacturer shall furnish drawings for approval showing the proposed test arrangement and description of the test procedure. These drawings shall be submitted at least 30 days in advance of the date scheduled for the tests. The drawings shall include data on the equipment to be used and the various measuring devices.

E. The pump shall not be shipped until hydrostatic and performance test submittals are approved.

F. The manufacturer shall submit for approval certified copies of the reports of the performance tests for each pump. These reports shall be complete and shall show all observed data, formulas, corrections, and constants used to arrive at the head, capacity, horsepower and efficiency of each test run. A sample calculation shall also be included to show how the results were obtained from the return data.

3.4 FIELD QUALITY CONTROL. The general requirements for system testing, check out, initial start-up, certification and instruction of plant personnel are contained in the section on Master Specification Section 01180, Equipment, Materials, Parts and Tools.

End of Supplemental Section

THIS PAGE INTENTIONALLY LEFT BLANK