

SPECIFICATIONS - DETAILED PROVISIONS
Section 11211 - Centrifugal Pumps

C O N T E N T S

PART 1 - GENERAL	1
1.01 DESCRIPTION.....	1
1.02 QUALITY	1
1.03 SUBMITTALS.....	1
PART 2 - PRODUCTS	2
2.01 FABRICATION AND MANUFACTURE	2
PART 3 - EXECUTION	3
3.01 EQUIPMENT TESTING.....	3
3.02 INSTALLATION	3
3.03 FIELD ACCEPTANCE TEST.....	3
3.04 CERTIFICATION OF INSTALLATION	4
3.05 WARRANTY.....	4
3.06 MAINTENANCE BOND FOR PUMPING EQUIPMENT	4

ATTACHMENT

[MANUFACTURER'S CERTIFICATE OF PROPER INSTALLATION](#)

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**SECTION 11211
CENTRIFUGAL PUMPS**

PART 1 - GENERAL

1.01 DESCRIPTION

The Contractor will be required to furnish and deliver the horizontal splitcase double suction centrifugal pump(s) in accordance with the specifications herein contained, except as otherwise required in the Special Provisions.

The water to be pumped will be clear and the temperatures are not expected to be more than eighty degrees (80°) Fahrenheit.

The pumps shall be as shown and specified on the contract drawings or approved equal.

1.02 QUALITY

The District desires to obtain pumping units having the best operating economy over the longest period of time and in making the award under these specifications each unit and bid amount will be evaluated on the basis of annual "fixed" operating cost, annual power or fuel cost and annual maintenance cost including wear factor, and the resulting amounts will be used in making comparison of bids for award of contract, but not making payments under the contract.

1.03 SUBMITTALS

The bidder shall furnish with his bid full details of the construction of the equipment quoted upon, including drawings of equipment identical in design and showing the internal construction of the pump and approximate overall dimensions of the complete unit, and shall also furnish duplicate copies of guaranteed performance curves showing net head capacity characteristics, brake horsepower requirements and net field pump efficiency from zero flow to the maximum flow permissible through each pump.

Within fifteen (15) days after awarding the contract, the Contractor shall furnish to the District, certified pertinent dimensions of the pumping equipment to be furnished.

PART 2 - PRODUCTS

2.01 FABRICATION AND MANUFACTURE

- A. The pump casing shall be of the horizontal split case type and shall be made of mehanite of maximum density and tensile strength. The case shall be split at the center line of shaft enabling the upper casing to be removed without disturbing the rotating element, the pump alignment or piping connections. Casing faces shall be accurately machined and doweled for bolting together and jacking screws shall be provided for separating. Drain plugs shall be provided in the lower half of the case; the upper half shall provide water seal pipe to the stuffing boxes. All connections shall be either flanged or threaded as specified on the Bidding Sheet.
- B. The impeller shall be made of hard bronze and shall be carefully machined outside and hand finished inside, and shall be accurately balanced both mechanically and hydraulically. The impeller shall be pressed onto the shaft over a key and shall be secured to prevent lateral movement along the shaft.
- C. Bronze removable wearing rings shall be provided on casing only. Impeller wearing ring (inner) shall be a machined surface on the impeller. Tolerance between wear rings shall be not greater than 0.020 inches. Casing wearing rings shall be shouldered against a seat in the case to prevent leakage between ring and casing and shall have streamlined water guiding surfaces.
- D. Grease lubricated ball bearings with high safety factor shall be provided. Bearings shall be mounted in cylindrical or cartridge type housings. Bearings shall amply provide for end thrust.
- E. The shaft shall be made of S.A.E. 1035 rolled carbon steel or equal, machined overall and accurately ground to size. Size of shaft shall be determined by maximum torsional load plus allowance for ample safety factor. It shall be amply protected against corrosion and abrasive action of the liquid by means of bronze shaft sleeves securely fastened to the shaft and butted each side of impeller to make a watertight seal to effectively exclude water from the shaft. Shaft sleeves shall continue in one piece through the stuffing box.
- F. Stuffing boxes shall be placed on both sides of the impeller, shall be wide and deep to accommodate five (5) or more rings of graphited, braided asbestos substitute packing and bronze lantern ring; packing shall be drawn up by split bronze glands and bronze gland bolts. Hard drawn copper water seal pipe shall connect from volute to bronze water seal ring in each stuffing box. Each inboard and outboard bracket shall be drilled and tapped for one-half (1/2) inch N.P.T. for gland drip drain. Bronze gland bolts shall be removable with eyebolts pinned in the casting.

PART 3 - EXECUTION

3.01 EQUIPMENT TESTING

The purpose of equipment testing is to demonstrate that the pump units meet the specified requirements.

- A. Tests shall be performed on the actual assembled unit over the entire operating range on the certified performance curve. Prototype model tests will not be acceptable.
- B. All pumps 10 to 50 horsepower shall be factory-tested in accordance with the above specifications. Pumps larger than 50 horsepower may be subject to a "factory witness test" attended by a District representative. The District shall be notified at least 2 weeks in advance such that a representative can witness the pump testing. Certified test results shall be submitted to the Engineer for approval prior to shipment.
- C. Pump curves shall reflect data secured during actual test runs and shall be signed by a responsible representative of the pump manufacture. Test reports and procedures shall conform to applicable requirements of the Hydraulic Institute Standards.

3.02 INSTALLATION

The Contractor shall install all pumping equipment in strict accordance with the manufacturer's instructions. Care shall be used in handling to avoid bumping, twisting, dropping, or otherwise damaging the equipment.

All pump manufacturers shall furnish the services of factory-trained personnel as required to examine the installation, supervise start-up of equipment installed, and repair the equipment at no additional expense to the District.

3.03 FIELD ACCEPTANCE TEST

The contractor under this specification shall have full responsibility for the proper installation and performance of said pumping equipment, including furnishing the services of a pumping equipment Field Service Engineer to inspect equipment installation, and to adjust, if necessary, any portion of the pumping equipment required herein. The manufacturer's Field Service Engineer shall assist the District in the proper conduct of pumping unit field acceptance tests. The pump units shall perform in the field as shown on the certified pump curves furnished by the Contractor. Tests shall also demonstrate operation without cavitation, vibration, overheating of moving parts, and excessive noise. The Contractor and pump manufacturer

Centrifugal Pumps
Section 11211 – 4

shall make necessary corrections to achieve smooth pump operation. In the event the tests reveal noncompliance of the workmanship or equipment, the Contractor shall either make alterations as necessary or replace the pumps in order to meet the requirements of the specifications at no additional cost to the District.

3.04 CERTIFICATION OF INSTALLATION

The Contractor shall submit the attached “Manufacturer’s Certificate of Proper Installation” to the District confirming that all pumping equipment was inspected, operation checked, and installation approved in writing by the respective pumping equipment representative.

3.05 WARRANTY

All pumping equipment shall carry an extended warranty for a two year period from the date of **acceptance**. All warranties shall be turned into the District prior to project completion.

3.06 MAINTENANCE BOND FOR PUMPING EQUIPMENT

The contractor or his supplier shall provide a maintenance bond (see EMWD standard form C-14 or C-14.1) from a bonding company acceptable to the District equal to 100% of the pumping equipment value (including motors, pumps and pump assemblies) for a two (2) year term starting when the District has accepted the contracted work. Equipment and/or components failing within this period due to deficiency in design, workmanship or material shall be removed, replaced, and reinstalled at no cost to the District, and said replacement shall be guaranteed for two years continuous service. The maintenance bond shall be submitted to the District prior to the performance test of the pump(s).

END OF SECTION 11211

MANUFACTURER'S CERTIFICATE OF PROPER INSTALLATION

OWNER: _____ EQPT SERIAL NO: _____
EQPT TAG NO: _____ EQPT/SYSTEM: _____
PROJECT NO: _____ SPEC. SECTION: _____

I hereby certify that the above-referenced equipment/system has been:

(Check Applicable)

- Installed in accordance with Manufacturer's recommendations.
- Inspected, checked, and adjusted.
- Serviced with proper initial lubricants.
- Electrical and mechanical connections meet quality and safety standards.
- All applicable safety equipment has been properly installed.
- System has been performance tested, and meets or exceeds specified performance requirements. (When complete system of one manufacturer)

Comments: _____

I, the undersigned Manufacturer's Representative, hereby certify that I am (i) a duly authorized representative of the manufacturer, (ii) empowered by the manufacturer to inspect, approve, and operate his equipment and (iii) authorized to make recommendations required to assure that the equipment furnished by the manufacturer is complete and operational, except as may be otherwise indicated herein. I further certify that all information contained herein is true and accurate.

Date: _____

Manufacturer: _____

By Manufacturer's Authorized Representative: _____
(Authorized Signature)

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