**** SPECIFICATIONS ****

2018 SEWER SELF-PRIMER PUMPS & RELATED MATERIALS

FOR:

ST. JOHN THE BAPTIST PARISH
PUBLIC UTILITIES DEPARTMENT
1801 WEST AIRLINE HIGHWAY
LAPLACE, LOUISIANA 70068

BY:

ST. JOHN THE BAPTIST PARISH
UTILITY DEPARTMENT

NOVEMBER 2017
ADVERTISEMENT FOR BIDS

ST. JOHN THE BAPTIST
2018 SEWER SELF-PRIMER PUMPS & RELATED MATERIALS

St. John the Baptist Parish (herein referred to as the “Owner”)

Sealed Bids will be received by St. John the Baptist Parish Council in the Percy Hebert Building, 1801 W. Airline Highway, LaPlace, La. 70068, at the receptionist's desk, until **2:45 p.m., January 9, 2018** for the following:

**ST. JOHN THE BAPTIST
2018 SEWER SELF-PRIMER PUMPS & RELATED MATERIALS**

Proposals shall be addressed to the St. John the Baptist Parish Council and delivered to the receptionist at St. John the Baptist Parish located at 1801 W. Airline Highway, LaPlace, LA 70068 and delivered no later than **2:45 p.m. on January 9, 2018** designated as “Sealed Bid – St. John the Baptist Parish- 2018 Bid for Sewer Self-Primer Pumps and Related Materials.” Any bids received after the specified time and date will not be considered. The sealed bids will be publicly opened and read aloud at **3:00 o’clock p. m., January 9, 2018** in the St. John the Baptist Parish Joel S. McTopy Council Chambers located at 1801 W. Airline Highway, LaPlace, LA 70068.

The Bid Proposal, Plans and Specifications may be examined at the Office of St. John the Baptist Parish Utility Department at 1801 W. Airline Hwy., LaPlace, LA 70068. Copies may be obtained at this office upon payment of $10.00 which constitutes the cost of reproduction and handling and is non-refundable. Details may be viewed and electronic bids are being accepted at [www.centralbidding.com](http://www.centralbidding.com). All Bid Documents and Specifications may also be viewed at the Parish website, [www.sjbparish.com](http://www.sjbparish.com).

The Owner reserves the right to accept or reject any and all bids and to waive any irregularities or informalities incidental thereto, and to accept any bid, which the Owner feels, serves their best interest. Such action will be in accordance with Title 38 of the Louisiana Revised Statues.

*St. John the Baptist Parish Council, being a government agency, is exempt from all sales tax. The vendor awarded the contract will be provided documentation to support their tax free purchases for this project. Therefore, the amount you bid should contain no sales tax.*

The Specifications have been prepared by St. John the Baptist Parish Utility Department setting forth those items deemed necessary by St. John the Baptist Parish personnel.

Pumps and materials will be awarded individually.
Each item of bid shall be awarded to the lowest bidder meeting Specifications and at the same time, best fulfilling the needs of St. John the Baptist Parish. The Utility Department will be the sole judge of equality of products and comparability to Specifications.

The term of this agreement shall be through December 31, 2018.

Order placement and order quantity will be determined by the St. John the Baptist Parish Council on an "as needed" basis. Purchase orders will be issued for all materials.

No bidder may withdraw his/her bid within thirty (30) days after the actual date of opening thereof.

Any person with disabilities requiring Special Accommodation must contact St. John the Baptist Parish at (985) 652-9569 no later than seven (7) days prior to bid opening. Participation by minority and female owned business, as well as businesses located in this Parish is encouraged.

ST. JOHN THE BAPTIST PARISH
Natalie Robottom, Parish President

Publish: December 6, 2017
December 13, 2017
December 20, 2017
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I. **SCOPE:**

The following Specifications have been prepared by the St. John the Baptist Parish Utility Department for the purpose of receiving bids on each of the type pumps herein specified for use in the St. John the Baptist Parish sewer system. These proposed pumps are to be delivered to the Parish upon request as replacement units to existing pumps. The request by the Parish shall be by purchase order (PO's) to the successful bidder for each type of pump. Each of the categorized type of pumps as designated in the bid form will be bid and awarded separately and considered as the price for that pump being delivered to the Parish Central Warehouse (FOB delivery site to 1801 West Airline Hwy., LaPlace, LA) within a maximum time limit from receipt of the Purchase Order of 28 days for pumps up to less than 20 hp or 12 weeks for pumps equal to or greater than 20 hp.

The bid for each type of pump shall be awarded to the lowest bidder meeting the specifications that best fulfill the requirements and needs of St. John the Baptist Parish. The Parish Director of Utilities shall be the sole judge of the equality of each pump in determining whether or not each item meets the stated specifications. The Utility Department reserves the right to seek additional bids or pricing for special projects beyond the scope of these bid specifications.

The bid prices for these pumps, motors and related materials are to be in effect until December 31, 2018. No price adjustments due to materials or manufacturing cost increase shall be allowed or accepted. The Parish shall place orders on an "as needed" basis. The Parish reserves the right to cancel this bid award due to the supplier's inability to provide the specified materials within the stated time limits.
II. SEWER PUMPS

A. HORIZONTAL SELF-PRIMING CENTRIFUGAL PUMP (4” TO 8”):

1. GENERAL

   A. PERFORMANCE CRITERIA

   The pump manufacturer must be ISO 9001:2008 revision certified, with scope of registration including design control and service after sales activities.

   The pump manufacturer must be registered to the ISO 14001 Environmental Management System standard and as such is committed to minimizing the impact of its activities on the environment and promoting environmental sustainability by the use of best management practices, technological advances, promoting environmental awareness and continual improvement.

   Pumps must be designed to handle raw, unscreened, domestic sanitary sewage. Pumps shall have (4”)(6”)(8”) suction connection, and (4”)(6”)(8”) discharge connection. Each pump shall be selected to perform under the engineer specified operating conditions:

   Pump Performance Certifications

   Solids Handling Capability

   All internal passages, impeller vanes, and recirculation ports shall pass a 3” spherical solid for 4-inch through 8-inch pumps. Smaller internal passages that create a maintenance nuisance or interfere with priming and pump performance shall not be permitted. Upon request from the engineer, manufacturer’s certified drawings showing size and location of the recirculation port(s) shall be submitted for approval.

   Reprime Performance

   Consideration shall be given to the sanitary sewage service anticipated, in which debris is expected to lodge between the suction check valve and its seat, resulting in the loss of the pump suction leg, and siphoning of liquid from the pump casing to the approximate center line of the impeller. Such occurrence shall be considered normal, and the pump must be capable of automatic, unattended operation with an air release line installed.

   During unattended operation, the pump shall retain adequate liquid in the casing to insure automatic repriming while operating at its rated speed in a completely open system. The need for a suction check valve or external priming device shall not be required.

   Pump must reprime 20 vertical ft. at the specified speed and impeller diameter (as indicated on the standard published pump curve for
model specified). Reprime lift is defined as the static height of the pump suction above the liquid, while operating with only one-half of the liquid remaining in the pump casing. The pump must reprime and deliver full capacity within five minutes after the pump is energized in the reprime condition. Reprime performance must be confirmed with the following test set-up:

A check valve to be installed down stream from the pump discharge flange. The check valve size shall be equal (or greater than) the pump discharge diameter.

A length of air release pipe shall be installed between pump and the discharge check valve. This line shall be open to atmosphere at all times duplicating the air displacement rate anticipated at a typical pump station fitted with an air release valve.

The pump suction check valve shall be removed. No restrictions in the pump or suction piping will prevent the siphon drop of the suction leg. Suction pipe configuration for reprime test shall incorporate a 2 feet minimum horizontal run, a 90° elbow and vertical run at the specified lift. Pipe size shall be equal to the pump suction diameter.

Impeller clearances shall be set as recommended in the pump service manual.

Repeatability of performance shall be demonstrated by testing five consecutive reprime cycles. Full pump capacity (flow) shall be achieved within five minutes during each cycle.

Liquid to be used for reprime test shall be water.

Upon request from the engineer, certified reprime performance test results, prepared by the manufacturer, and certified by a registered professional engineer, shall be submitted for approval prior to shipment.

B. Manufacturer's Warranty

The pump manufacturer shall warrant the pump equipment to be of quality construction, free of defects in material and workmanship. A written warranty shall include specific details described below.

All equipment, apparatus, and parts furnished shall be warranted for sixty (60) months, excepting only those items that are normally consumed in service, such as oils, grease, packing, gaskets, O-rings, etc. The pump manufacturer shall be solely responsible for warranty of the pump equipment and all components.

Components failing to perform as specified by the engineer, or as represented by the manufacturer, or as proven defective in service during the warranty period, shall be replaced, repaired, or satisfactorily modified by the manufacturer.
It is not intended that the pump manufacturer assume liability for consequential damages or contingent liabilities arising from failure of any vendor supplied product or part which fails to properly operate, however caused. Consequential damages resulting from defects in design, or delays in delivery are also beyond the manufacturer's scope of liability.

This limited warranty shall be valid only when installation is made and use and maintenance is performed in accordance with manufacturer recommendations. The warranty shall become effective on the date of acceptance by the purchaser or the purchaser's authorized agent, or sixty (60) days after installation, or ninety (90) days after shipment from the factory, whichever occurs first.

The pump supplier shall show evidence that he maintains a fully equipped factory authorized organization capable of furnishing adequate service for the equipment furnished, including spare parts within a 150 mile radius of the job site. Suppliers employing outside organizations for “on call” service shall not be considered. The pump supplier shall be a factory authorized distributor and warranty provider of the product offered.

2. PRODUCT

A. MANUFACTURER

The specifications depict equipment and materials which are to be manufactured in the USA with all castings and machining to be sourced in North America and suitable for the service anticipated. Spare parts for offered pumps are to be readily available.

B. PUMP DESIGN

Pumps shall be horizontal, self-priming centrifugal type, designed specifically for handling raw, unscreened, domestic sanitary sewage. Pump solids handling capability and performance criteria shall be in accordance with requirements listed under PART 1 - GENERAL of this section.

The pump manufacturer must be ISO 9001:2008 revision certified, with scope of registration including design control and service after sales activities.

Materials and Construction Features

Pump casing shall be cast iron Class 30 with integral volute scroll. Casing shall incorporate following features:

Mounting feet sized to prevent tipping or binding when pump is completely disassembled for maintenance.

Fill port coverplate, 3 1/2" diameter, shall be opened after loosening a hand nut/clamp bar assembly. In consideration for safety, hand nut threads must provide slow release of pressure, and the clamp bar shall be retained by detente lugs. A Teflon gasket shall prevent adhesion of the fill port cover to the casing.
Casing drain plug shall be at least 1 1/4" NPT to insure complete and rapid draining.

Liquid volume and recirculation port design shall be consistent with performance criteria listed under PART 1 - GENERAL of this section.

Coverplate assembly shall be cast iron Class 30. Design must incorporate following maintenance features:

A lightweight inspection coverplate, retained by acorn nuts, for access to pump interior for removal of stoppages. Designs that require removal of complete coverplate assembly for access to the impeller will not be accepted.

Retained by acorn nuts for complete access to pump interior. Back coverplate removal must allow service to the impeller, seal, wear plate or check valve without removing suction or discharge piping. Back coverplate shall incorporate an obstruction free flow path by combining four support posts into a two-point “webbed” plate design for increased durability, reduced clogging, and increased operational efficiency.

In consideration for safety, a pressure relief valve shall be supplied in the inspection coverplate. Relief valve shall open at 75-200 PSI.

One O-ring of Buna-N material shall seal inspection coverplate to back coverplate.

Two O-rings of Buna-N material shall seal back coverplate to pump casing.

Pusher bolt capability to assist in removal of inspection coverplate or back coverplate. Pusher bolt threaded holes shall be sized to accept same retaining capscrews as used in rotating assembly.

Easy-grip handle shall be mounted to face of inspection coverplate.

Rotating assembly, which includes impeller, shaft, mechanical shaft seal, lip seals, bearings, seal plate and bearing housing, must be removable as a single unit without disturbing the pump casing or piping. Design shall incorporate following features:
Seal plate shall be gray iron Class 30 and bearing housing shall be cast iron Class 30. Separate oil filled cavities, vented to atmosphere, shall be provided for shaft seal and bearings. Cavities must be cooled by the liquid pumped. Three lip seals will prevent leakage of oil.

The bearing cavity shall have an oil level sight gauge and fill plug check valve. The clear sight gauge shall provide easy monitoring of the bearing cavity oil level and condition of oil without removal of the fill plug check valve. The check valve shall vent the cavity but prevent introduction of moist air to the bearings.

The seal cavity shall have an oil level sight gauge and fill/vent plug. The clear sight gauge shall provide easy monitoring of the seal cavity oil level and condition of oil without removal of the fill/vent plug.

Double lip seal shall provide an atmospheric path providing positive protection of bearings, with capability for external drainage monitoring.

Impeller shall be ductile iron, two-vane, semi-open, non-clog, with integral pump out vanes on the back shroud. Impeller shall thread onto the pump shaft and be secured with a lock screw and conical washer.

 Shaft shall be AISI 4150 alloy steel.

Bearings shall be anti-friction ball type of proper size and design to withstand all radial and thrust loads expected during normal operation. Bearings shall be oil lubricated from a dedicated reservoir. Pump designs which use the same oil to lubricate the bearings and shaft seal shall not be acceptable.

Shaft seal shall be cartridge oil lubricated mechanical type. The stationary and rotating seal faces shall be tungsten titanium carbide alloy. Each mating surface shall be lapped to within three light bands flatness (35 millionths of an inch), as measured by an optical flat under monochromatic light. The stationary seal seat shall be double floating by virtue of a dual O-ring design; an external O-ring secures the stationary seat to the seal plate, and an internal O-ring holds the faces in alignment during periods of mechanical or hydraulic shock (loads which cause shaft deflection, vibration, and axial/radial movement). Elastomers shall be viton; cage and spring to be stainless steel. Seal shall be oil lubricated from a dedicated reservoir. The same oil shall not lubricate both shaft seal and shaft bearings. Seal shall be warranted in accordance with requirements listed under PART 1 - GENERAL of this section.

Pusher bolt capability to assist in removal of rotating assembly. Pusher bolt threaded holes shall be sized to accept same capscrews as used for retaining rotating assembly.

Adjustment of the impeller face clearance (distance between impeller and wearplate) shall be accomplished by external means.

1) Clearances shall be maintained by a four point external shimless coverplate adjustment system, utilizing a four collar and four adjusting screw design allowing for incremental adjustment of clearances by hand as required. Each of the four points shall be lockable to prevent inadvertent clearance increases
or decreases due to equipment vibration or accidental operator contact. The
four point system also allows for equal clearance gaps at all points between
the impeller and wear plate. Requirement of realignment of belts, couplings,
etc., shall not be acceptable. Coverplate shall be capable of being removed
without disturbing clearance settings. Clearance adjustment systems that
utilize less than four points will not be considered.

2) There shall be provisions for additional clearance adjustment in the event that
adjustment tolerances have been depleted from the coverplate side of the
pump. The removal of stainless steel shims from the rotating assembly side
of the pump shall allow for further adjustment as described above.

3) Clearance adjustment which requires movement of the shaft only, thereby
adversely affecting seal working length or impeller back clearance, shall not
be acceptable.

Suction check valve shall be molded Neoprene with integral steel and nylon
reinforcement. A blow-out center shall protect pump casing from hydraulic shock
or excessive pressure. Removal or installation of the check valve must be
accomplished through the coverplate opening, without disturbing the suction
piping. Sole function of check valve shall be to save energy by eliminating need
to reprime after each pumping cycle. Pumps requiring a suction check valve to
assist reprime will not be acceptable.

Spool flanges shall be one-piece cast iron, class 30 fitted to suction and/or
discharge ports. Each spool shall have one 1-1/4" NPT and one 1/4" NPT tapped
hole with pipe plugs for mounting gauges or other equipment.

Serviceability
The pump manufacturer shall demonstrate to the engineer's satisfaction that
consideration has been given to reducing maintenance costs.

No special tools shall be required for replacement of any components within the
pump.

Pumps are to be supplied be a Factory Authorized Distributor of the brand
offered.

3. EXECUTION

A. EXAMINATION

Contractor shall off-load equipment at installation site using equipment of sufficient
size and design to prevent injury or damage. Immediately after off-loading,
contractor shall inspect complete pump and appurtenances for shipping damage or
missing parts. Any damage or discrepancy shall be noted in written claim with
shipper prior to accepting delivery. Validate all pump serial numbers and parts lists
with shipping documentation. Notify the manufacturer's representative of any
unacceptable conditions noted with shipper.
B. **HORIZONTAL SELF-PRIMING CENTRIFUGAL PUMP (10”):**

1. **GENERAL**

   **A. PERFORMANCE CRITERIA**

   The pump manufacturer must be ISO 9001:2008 revision certified, with scope of registration including design control and service after sales activities.

   The pump manufacturer must be registered to the ISO 14001 Environmental Management System standard and as such is committed to minimizing the impact of its activities on the environment and promoting environmental sustainability by the use of best management practices, technological advances, promoting environmental awareness and continual improvement.

   Pumps must be designed to handle raw, unscreened, domestic sanitary sewage. Pumps shall have 10” suction connection, and 10” discharge connection. Each pump shall be selected to perform under engineer provided operating conditions:

   **Pump Performance Certifications**

   **Solids Handling Capability**

   All internal passages, impeller vanes, and recirculation ports shall pass a 3" spherical solid. Smaller internal passages that create a maintenance nuisance or interfere with priming and pump performance shall not be permitted. Upon request from the engineer, manufacturer’s certified drawings showing size and location of the recirculation port(s) shall be submitted for approval.

   **Reprime Performance**

   Consideration shall be given to the sanitary sewage service anticipated, in which debris is expected to lodge between the suction check valve and its seat, resulting in the loss of the pump suction leg, and siphoning of liquid from the pump casing to the approximate center line of the impeller. Such occurrence shall be considered normal, and the pump must be capable of automatic, unattended operation with an air release line installed.

   During unattended operation, the pump shall retain adequate liquid in the casing to insure automatic repriming while operating at its rated speed in a completely open system. The need for a suction check valve or external priming device shall not be required.

   Pump must reprime 20 vertical ft. at the specified speed and impeller diameter (as indicated on the standard published curve for the model specified). Reprime lift is defined as the static height of the pump suction above the liquid, while operating with only one-half of the liquid remaining in the pump casing. The pump must reprime and deliver full capacity within five minutes after the pump is energized in the reprime condition. Reprime performance must be confirmed with the following test set-up:

   A check valve to be installed down stream from the pump discharge flange. The check valve size shall be equal (or greater than) the pump discharge diameter.
A length of air release pipe shall be installed between pump and the discharge check valve. This line shall be open to atmosphere at all times duplicating the air displacement rate anticipated at a typical pump station fitted with an air release valve.

The pump suction check valve shall be removed. No restrictions in the pump or suction piping will prevent the siphon drop of the suction leg. Suction pipe configuration for reprime test shall incorporate a 2 feet minimum horizontal run, a 90° elbow and vertical run at the specified lift. Pipe size shall be equal to the pump suction diameter.

Impeller clearances shall be set as recommended in the pump service manual.

Repeatability of performance shall be demonstrated by testing five consecutive reprime cycles. Full pump capacity (flow) shall be achieved within five minutes during each cycle.

Liquid to be used for reprime test shall be water.

Upon request from the engineer, certified reprime performance test results, prepared by the manufacturer, and certified by a registered professional engineer, shall be submitted for approval prior to shipment.

B. Manufacturer's Warranty

The pump manufacturer shall warrant the pump equipment to be of quality construction, free of defects in material and workmanship. A written warranty shall include specific details described below.

All equipment, apparatus, and parts furnished shall be warranted for sixty (60) months, excepting only those items that are normally consumed in service, such as oils, grease, packing, gaskets, O-rings, etc. The pump manufacturer shall be solely responsible for warranty of the pump equipment and all components.

Components failing to perform as specified by the engineer, or as represented by the manufacturer, or as proven defective in service during the warranty period, shall be replaced, repaired, or satisfactorily modified by the manufacturer.

It is not intended that the pump manufacturer assume liability for consequential damages or contingent liabilities arising from failure of any vendor supplied product or part which fails to properly operate, however caused. Consequential damages resulting from defects in design, or delays in delivery are also beyond the manufacturer's scope of liability.

This limited warranty shall be valid only when installation is made and use and maintenance is performed in accordance with manufacturer recommendations. The warranty shall become effective on the date of acceptance by the purchaser or the purchaser's authorized agent, or sixty (60) days after installation,
or ninety (90) days after shipment from the factory, whichever occurs first.

The pump supplier shall show evidence that he maintains a fully equipped factory authorized organization capable of furnishing adequate service for the equipment furnished, including spare parts within a 150 mile radius of the job site. Suppliers employing outside organizations for “on call” service shall not be considered. The pump supplier shall be a factory authorized distributor and warranty provider of the product offered.

2. PRODUCT

A. MANUFACTURER

The specifications and project drawings depict equipment and materials which are to be manufactured in the USA with all castings and machining to be sourced in North America and suitable for the service anticipated. Spare parts for offered pumps are to be readily available.

The pumps must be of standard catalog design, totally warranted by the manufacturer.

Manufacturer must show proof of original product design and testing. Products violating intellectual property regulations shall not be allowed, as they may violate international law and expose the user or engineer to unintended liabilities. “Reverse-engineered” products fabricated to substantially duplicate the design of original product shall not be allowed, as they may contain substantial differences in tolerances and material applications addressed in the original design, which may contribute to product failure.

The term “pump manufacturer” shall be defined as the entity which designs, machines, assembles, hydraulically tests and warranties the final product. Any entity that does not meet this definition will not be considered a “pump manufacturer” and is not an acceptable supplier. For quality control reasons and future pump and parts availability, all major castings of the pump shall be sourced and machined in North America.

B. PUMP DESIGN

Pumps shall be horizontal, self-priming centrifugal type, designed specifically for handling raw, unscreened, domestic sanitary sewage. Pump solids handling capability and performance criteria shall be in accordance with requirements listed under PART 1 - GENERAL of this section.

The pump manufacturer must be ISO 9001:2008 revision certified, with scope of registration including design control and service after sales activities.
Materials and Construction Features

Pump casing shall be cast iron Class 30 with integral volute scroll. Casing shall incorporate following features:

Mounting feet sized to prevent tipping or binding when pump is completely disassembled for maintenance.

Fill port cover plate, 3 1/2" diameter, shall be opened after loosening a hand nut/clamp bar assembly. In consideration for safety, a clamp bar screw must provide slow release of pressure, and the clamp bar shall be retained by detente lugs. A Teflon gasket shall prevent adhesion of the fill port cover to the casing.

Casing drain plug shall be at least 1 1/4" NPT to insure complete and rapid draining.

Liquid volume and recirculation port design shall be consistent with performance criteria listed under PART 1 - GENERAL of this section.

Suction Head shall be Class 30 cast iron. Its design must incorporate following maintenance features:

1) The suction head will be secured to the pump casing by using hex head cap screws and lock washers. Access to the impeller and mechanical seal shall be accomplished by removing the suction head.

2) Removal of any blockages in the impeller shall be accomplished by removing the suction head, or through a cleanout cover on the suction head. In consideration of safety, two clamp bar screws must provide slow release of pressure on two clamp bars securing the cleanout cover. A Teflon gasket shall prevent adhesion of the cleanout cover to the suction head casing.

3) Removal of the suction check valve shall be accomplished through the removable cleanout cover on the suction head.

4) In consideration for safety, a pressure relief valve shall be supplied in the suction head. The relief valve shall open at 75-200 PSI.

Rotating assembly, which includes impeller, shaft, mechanical shaft seal, lip seals, bearings, sealplate and bearing housing, must be removable as a single unit without disturbing the pump casing or piping. Design shall incorporate following features:
Seal plate shall be Class 30 iron and bearing housing shall be cast iron Class 30. Separate oil filled cavities, vented to atmosphere, shall be provided for shaft seal and bearings. Cavities must be cooled by the liquid pumped. Three lip seals will prevent leakage of oil.

The bearing cavity shall have an oil level sight gauge and fill plug check valve. The clear sight gauge shall provide easy monitoring of the bearing cavity oil level and condition of oil without removal of the fill plug check valve. The check valve shall vent the cavity but prevent introduction of moist air to the bearings.

The seal cavity shall have an oil level sight gauge and fill/vent plug. The clear sight gauge shall provide easy monitoring of the seal cavity oil level and condition of oil without removal of the fill/vent plug.

Double lip seal shall provide an atmospheric path providing positive protection of bearings, with capability for external drainage monitoring.

Impeller shall be ductile iron 65-45-12, two-vane, semi-open, non-clog, with integral pump out vanes on the back shroud. Impeller shall thread onto the pump shaft and be secured with a lock screw and conical washer.

Impeller shaft shall be AISI 17-4 pH stainless steel.

Bearings shall be anti-friction ball type of proper size and design to withstand all radial and thrust loads expected during normal operation. Bearings shall be oil lubricated from a dedicated reservoir. Pump designs which use the same oil to lubricate the bearings and shaft seal shall not be acceptable.

Shaft seal shall be cartridge oil lubricated mechanical type. The stationary and rotating seal faces shall be tungsten titanium carbide alloy. Each mating surface shall be lapped to within three light bands flatness (35 millionths of an inch), as measured by an optical flat under monochromatic light. The stationary seal seat shall be double floating by virtue of a dual O-ring design; an external O-ring secures the stationary seat to the seal plate, and an internal O-ring holds the faces in alignment during periods of mechanical or hydraulic shock (loads which cause shaft deflection, vibration, and axial/radial movement). Elastomers shall be viton; cage and spring to be stainless steel. Seal shall be oil lubricated from a dedicated reservoir. The same oil shall not lubricate both shaft seal and shaft bearings. Seal shall be warranted in accordance with requirements listed under PART 1 - GENERAL of this section.

Pusher bolt capability to assist in removal of rotating assembly. Pusher bolt threaded holes shall be sized to accept same cap screws as used for retaining rotating assembly.

Adjustment of the impeller face clearance (distance between impeller and wear plate) shall be accomplished by external means.

Clearances shall be maintained by using external shims between the casing ring of the rotation assembly and the pump casing itself. Shims will be of
various sizes to allow precise adjustment of this clearance. The clearance can be measured by removing the cleanout cover on the suction head.

Clearance adjustment which requires movement of the shaft only, thereby adversely affecting seal working length or impeller back clearance, shall not be acceptable.

Suction check valve shall be molded Neoprene with integral steel and nylon reinforcement. A blow-out center shall protect pump casing from hydraulic shock or excessive pressure. Removal or installation of the check valve must be accomplished through the cleanout cover on the suction head without disturbing the suction piping. Sole function of check valve shall be to save energy by eliminating need to reprime after each pumping cycle. Pumps requiring a suction check valve to assist reprime will not be acceptable.

Removal of the rotating assembly will be accomplished through the front or the back of the pump casing.

Serviceability

The pump manufacturer shall demonstrate to the engineer's satisfaction that consideration has been given to reducing maintenance costs.

No special tools shall be required for replacement of any components within the pump.

Pumps are to be supplied by a Factory Authorized Distributor of the brand offered.

3. EXECUTION

A. EXAMINATION

Contractor shall off-load equipment at installation site using equipment of sufficient size and design to prevent injury or damage. Immediately after off-loading, contractor shall inspect complete pump and appurtenances for shipping damage or missing parts. Any damage or discrepancy shall be noted in written claim with shipper prior to accepting delivery. Validate all pump serial numbers and parts lists with shipping documentation. Notify the manufacturer's representative of any unacceptable conditions noted with shipper.