

DATE: 3/23/2016

INVITATION TO BID
THIS IS NOT AN ORDER

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BID NO.: 50-00116157

JEFFERSON PARISH

PURCHASING DEPARTMENT
P.O. BOX 9
GRETN, LA. 70054-0009
504-364-2678

VENDOR: 27118 BLANK BID COPY VENDOR

BUYER: CGasper

Bids will be received until 11:00 AM, 4/05/2016 via fax: 504-364-2693 or via online at www.jeffparish.net

All bids submitted are subject to these instructions and general conditions and any special conditions and specifications contained herein, all of which are made part of this bid proposal reference. By submitting a bid, vendor agrees to comply with all provisions of Louisiana Law, as well be in compliance with the Jefferson Parish Code of Ordinances, Louisiana Code of Ethics, applicable Jefferson Parish ethical standards and Jefferson Parish Resolution No. 113646 and/or Resolution No. 113647. A copy of these resolutions may be obtained from the Office of the Parish Clerk, Suite 6700, Jefferson Parish General Government Building, 200 Derbigny Street, Gretna, LA 70053. You may also obtain a copy by visiting the Purchasing Department webpage at www.purchasing.jeffparish.net and clicking on On-line forms.

All vendors submitting bids must register as a Jefferson Parish vendor if not already yet registered. Bidders may be required to furnish current W-9 Forms and respective Tax Identification Numbers within 10 days after bid opening if such information is not on file or not up to date. Registration forms may be downloaded from www.purchasing.jeffparish.net and clicking on Vendor Information.

As per LSA-RS 47:301 et seq., all governmental bodies are excluded from payment of sales taxes to any Louisiana taxing body. Quotations shall be based on F.O.B. Delivered, anywhere within the Parish as designated by the Purchasing Department. JEFFERSON PARISH WILL ACCEPT ONE BID ONLY FROM EACH VENDOR. Items bid must meet specifications. JEFFERSON PARISH will accept one price for each item unless otherwise indicated. Two or more prices for one item will result in bid rejection. Bidders are required to complete, sign and return the bid form and/or complete and return the associated line item pricing forms as indicated. The price quoted for work shall be stated in figures. In the event there is a difference in unit prices and totals, the unit prices shall prevail.

JEFFERSON PARISH reserves the right to award contracts or place orders on a lump sum or individual item basis, or such combination, as shall in its judgment be in the best interest of JEFFERSON PARISH. Every contract or order shall be awarded to the LOWEST RESPONSIVE and RESPONSIBLE BIDDER, taking into consideration the CONFORMITY WITH THE SPECIFICATIONS and the DELIVERY AND/OR COMPLETION DATE

JEFFERSON PARISH reserves the right to cancel all or any part of an order if not shipped promptly. No charges will be allowed for parking or cartage unless specified in the quotation. The order must not be filled at a higher price than quoted. JEFFERSON PARISH reserves the right to cancel at any time and for any reason by issuing a THIRTY (30) day written notice to the contractor.

JEFFERSON PARISH requires all products to be new (current) and all work must be performed according to standard practices for the project. Unless otherwise specified, no aftermarket parts will be accepted. Unless otherwise specified, all workmanship and materials must have at least one (1) year guaranty, in writing, from the date of delivery and/or acceptance of the project. Any deviations or alterations from the specifications must be indicated and/or supporting documentation supplied with bid submission.

If this bid requires a pre-bid conference (see Additional Requirements section), bidders are advised that such conference will be held to allow bidders the opportunity to identify any discrepancies in the bid specifications and seek further clarification regarding instructions. The Purchasing Department will issue a written response to bidders' questions in the form of an Addendum.

All formal Addenda require written acknowledgment on the bid form by the bidder. Failure to acknowledge an Addendum on the bid form shall cause the bid to be rejected; JEFFERSON PARISH reserves the right to award bid to next lowest responsive and responsible bidder in this event.

USE OF BRAND NAMES AND STOCK NUMBERS: Where brand names and stock numbers are specified, it is for the purpose of establishing certain minimum standards of quality. Bids may be submitted for products of equal quality, provided brand names and stock numbers are specified. Complete product data may be required prior to award.

Quantities listed are for bidding purposes only. Actual requirements may be more or less than quantities listed.

Bidders are not to exclude from participation in, deny the benefits of, or subject to discrimination under any program or activity, any person in the United States on the grounds of race, color, national origin, or sex; nor discriminate on the basis of age under the Age Discrimination Act of 1975, or with respect to an otherwise qualified handicapped individual as provided in Section 504 of the Rehabilitation Act of 1973, or on the basis of religion, except that any exemption from such prohibition against discrimination on the basis of religion as provided in the Civil Rights Act of 1964, or Title VI and VII of the Act of April 11, 1968, shall also apply. This assurance includes compliance with the administrative requirements of the Revenue Sharing final handicapped discrimination provisions contained in Section 51.55 (c), (d), (e), and (k)(5) of the Regulations. New construction or renovation projects must comply with Section 504 of the 1973 Rehabilitation Act, as amended, in accordance with the American National Standard Institute's specifications (ANSI A117.1-1961).

INSTRUCTIONS FOR BIDDERS AND GENERAL CONDITIONS

IN ACCORDANCE WITH STATE REGULATIONS JEFFERSON PARISH OFFERS ELECTRONIC PROCUREMENT TO ALL VENDORS

This Electronic Procurement System allows vendors the convenience of reviewing and submitting bids online. This is a secure site and authorized personnel have limited read access only.

Please visit the Purchasing Department webpage at <http://purchasing.jeffparish.net> to register and review Jefferson Parish solicitations.

ADDITIONAL REQUIREMENTS FOR THIS BID

PLEASE MATCH THE NUMBERS PRINTED IN THIS BOX WITH THE CORRESPONDING INSTRUCTIONS BELOW.

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1. All bidders must attend the MANDATORY pre-bid conference and will be required to sign in and out as evidence of attendance. In accordance with LSA R.S. 38:2212(l), all prospective bidders shall be present at the beginning of the MANDATORY pre-bid conference and shall remain in attendance for the duration of the conference. Any prospective bidder who fails to attend the conference or remain for the duration shall be prohibited from submitting a bid for the project.
2. Attendance to this pre-bid conference is optional. However, failure to attend the pre-bid conference shall not relieve the bidder of responsibility for information discussed at the conference. Furthermore, failure to attend the pre-bid conference and inspection does not relieve the successful bidder from the necessity of furnishing materials or performing any work that may be required to complete the work in accordance with the specification with no additional cost to the owner.
3. Contractor must hold current applicable JEFFERSON PARISH licenses with the Department of Inspection and Code Enforcement. Contractor shall obtain any and all permits required by the JEFFERSON PARISH Department of Inspection and Code Enforcement. The contractor shall be responsible for the payment of these permits. All permits must be obtained prior to the start of the project. Contractor must also hold any and all applicable Federal and State licenses. Contractor shall be responsible for the payment of these permits and shall obtain them prior to the start of the project.
4. A LA State Contractor's License will be required in accordance with LSA R.S. 37-2150 et. seq. and such license number will be shown on the outside of the bid envelope. Failure to comply will cause the bid to be rejected. Additionally if submitting the bid electronically, then the license number must be entered in the appropriate field in the Electronic Procurement system. Failure to comply will cause the bid to be rejected.
5. It is the bidder's responsibility to visit the job site and evaluate the job before submitting a bid.
6. Job site must be clean and free of all litter and debris daily and upon completion of the contract. Passageways must be kept clean and free of material, equipment, and debris at all times. Flammable material must be removed from the job site daily because storage will not be permitted on the premises. Precautions must be exercised at all times to safeguard the welfare of JEFFERSON PARISH and the general public.

INSTRUCTIONS FOR BIDDERS AND GENERAL CONDITIONS

7. **PUBLIC WORKS BIDS:** All awards for public works in excess of \$5,000.00 will be reduced to a formal contract which shall be recorded at the contractor's expense with the Clerk of Court and Ex-Officio Recorder of Mortgages for the Parish of Jefferson. A price list of recordation costs may be obtained from the Clerk of Court and Ex-Officio Recorder of Mortgages for the Parish of Jefferson. All awards in excess of \$25,000.00 will require both a performance and a payment bond. Unless otherwise stated in the bid specifications, the performance bond requirements shall be 100% of the contract price. Unless otherwise state in the bid specifications, the payment bond requirements shall be 100% of the contract price. Both bonds shall be supplied at the signing of the contract.
8. **NON-PUBLIC WORKS BIDS:** A performance bond will be required for this bid. The amount of the bond will be 100% of the contract price unless otherwise indicated in the specifications. The performance bond shall be supplied at the signing of the contract.
9. **NON-PUBLIC WORKS BIDS:** A payment bond will be required for this bid. The amount of the bond will be 100% of the contract price unless otherwise indicated in the specifications. The payment bond shall be supplied at the signing of the contract.
10. Unless otherwise stated in the bid specifications, the successful bidder will be required to procure standard insurance policies evidencing Parish-mandated insurance requirements as indicted on the attached sheet. The current certificate of insurance must be submitted by low bidder within 10 days after bid opening to the Purchasing Department. Failure to comply will cause bid to be rejected. JEFFERSON PARISH reserves the right to award bid to the next lowest responsive and responsible bidder in this event.
11. A bid bond will be required with bid submission in the amount of 5% of the total bid, unless otherwise stated in the bid specifications. Acceptable forms shall be limited to cashier's check, certified check, or surety bid bond. All sureties must be in original format (no copies). If submitting a bid online, vendors must submit an electronic bid bond through the respective online clearinghouse bond management system(s) as indicated in the electronic bid solicitation on Central Auction House. No scanned paper copies of any bid bond will be accepted as part of the electronic bid submission.
12. This is a requirements contract to be provided on an as needed basis. JEFFERSON PARISH makes no representations on warranties with regard to minimum guaranteed quantities unless otherwise stated in the bid specifications.
13. Freight charges should be included in total cost when quoting. If not quoted FOB DELIVERED, freight must be quoted as a separate item. Bid may be rejected if not quoted FOB DELIVERED or if freight charges are not indicated on bid form.
14. **PUBLIC WORKS BIDS - Completed, Signed and Properly Notarized Affidavits (in Original Format) required;** Non-Conviction Affidavit, Non-Collusion Affidavit, Campaign Contribution Affidavit and E-Verify Affidavit must be completed, signed, notarized and submitted by low bidder within 10 days after bid opening to the Purchasing Department on all solicitations for construction, alteration or demolition of public building or project, including but not limited to requirements found in LSA-RS 38:2212.9; LSA-RS 38:2212.10; LSA-RS 38:2224; Code of Ordinances, Jefferson Parish, Louisiana, Sec 2-923.1. Failure to comply will cause bid to be rejected; the Parish reserves the right to award bid to the next lowest responsive and responsible bidder in this event. For the convenience of vendors, all affidavits have been combined into one form entitled PUBLIC WORKS BID AFFIDAVIT. This affidavit must be submitted in its original format for the bid to be considered responsive.
15. **NON PUBLIC WORK BIDS - Completed, Signed and Properly Notarized Affidavits (in Original Format) required;** Non-Collusion Affidavit, and Campaign Contribution Affidavit must be completed, signed, notarized and submitted by low bidder within 10 days after bid opening to the Purchasing Department. See LSA-RS 38:2212.10; LSA-RS 38:2224; Code of Ordinances, Jefferson Parish, Louisiana, Sec 2-923.1 Failure to comply will cause bid to be rejected; the Parish reserves the right to award bid to the next lowest responsive and responsible bidder in this event. For the convenience of vendors, all affidavits have been combined into one form entitled NON PUBLIC WORKS BID AFFIDAVIT. This affidavit must be submitted in its original format for the bid to be considered responsive.

It shall be the duty of every parish officer, employee, department, agency, special district, board, and commission: and the duty of every contractor, subcontractor, and licensee of the parish, and the duty of every applicant for certification of eligibility for a parish contract or program, to cooperate with the Inspector General in any investigation, audit, inspection, performance review, or hearing pursuant to Jefferson Parish Code of Ordinances Section 2-155.10(19). By submitting a bid, vendor acknowledges this and will abide by all provisions of the referenced Jefferson Parish Code of Ordinances.

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Page: 4

BID NO.: 50-00116157

JEFFERSON PARISH

PURCHASING DEPARTMENT
P.O. BOX 9
GRETN, LA. 70054-0009
504-364-2678

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BUYER: CGasper

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JEFFERSON PARISH is expecting all products to be new and all work is to be done in a workman-like manner, according to standard practices. Any deviations or alterations from the specifications must be indicated and backup documentation supplied with your quotation.

DELIVERY: FOB JEFFERSON PARISH

INDICATE DELIVERY DATE ON EQUIPMENT AND SUPPLIES

8-10 WEEKS

INDICATE STARTING TIME (IN DAYS) FOR CONSTRUCTION WORK

INDICATE COMPLETION TIME (IN DAYS) FOR CONSTRUCTION WORK

In the event that addenda are issued with this bid, bidders MUST acknowledge all addenda on the bid form. Bidder must acknowledge receipt of an addendum on the bid form as indicated. Failure to acknowledge any addendum on the bid form will result in bid rejection.

Acknowledge Receipt of Addenda: NUMBER: _____

NUMBER: _____

NUMBER: _____

NUMBER: _____

LOUISIANA CONTRACTOR'S LICENSE NO.: (if applicable) _____

***** ALL BIDDERS MUST COMPLETE SECTION BELOW *****

FIRM NAME:

FLUID PROCESS & PUMPS

SIGNATURE:

(Must be signed here)

Bill Bloom

TITLE:

SALES

PRINT OR TYPE NAME:

Bill Bloom

ADDRESS:

P.O. BOX 10608

CITY, STATE:

NEW ORLEANS, LA.

ZIP:

70181

TELEPHONE:

(504) 733-1330

FAX:

(504) 736-9348

EMAIL ADDRESS:

BB@FLUIDPROCESS.NET

TOTAL PRICE OF ALL BID ITEMS: \$ 16,411.00

INVITATION TO BID FROM JEFFERSON PARISH - continued

BID NO.: 50-00116157

SEALED BID

ITEM NUMBER	QUANTITY	U/M	DESCRIPTION OF ARTICLES	UNIT PRICE QUOTED	TOTALS
1	1.00	EA	FLYGT 3 HP SUBMERSIBLE PUMP 0010 - Flygt 3 Hp Submersible Pumps, 230/3 Phase with FM Explosion Proof Motors, 50 Foot Power Cable, Hi Chrome Impellers and Insert Rings Item Model: NP3085.095	5,300.00	5,300.00
2	1.00	EA	0020 - 4 Inch Straight Discharge Adapters Item Model: 4 Inch ADAPT	400.00	400.00
3	1.00	EA	0030 - FLS Seal Leakage Detector with Motor Thermal Switches Item Model: FLS	200.00	200.00
4	1.00	EA	0040 - Flygt SmartRun VFD's-3HP 230/3-For Installation in JP Control Panel By Others Item Model: SRC311	9,611.00	9,611.00
5	1.00	EA	0050 - Siemens A1000i Submersible Level Transducer with 50 Foot of Cable and Suspension Kit Item Model: A1000i	600.00	600.00
6	1.00	EA	0060 - Freight to Jefferson Parish	300.00	300.00
7	1.00	EA	0070 - Factory Startup	NO CHARGE	NO CHARGE
*NOTE: WE ARE BIDDING AN ALTERNATE MANUFACTURER TO MEET AND/OR EXCEED ATTACHED SPECIFICATIONS. LINE ITEMS 1 & 2 - HYDROMATIC PUMP CO. LINE ITEMS 3, 4 & 5 - TESCO CONTROLS, SUBMITTAL DATA CAN BE FURNISHED UPON RECEIPT OF PURCHASE ORDER					

**SPECIFICATIONS
SMALL SOLIDS-HANDLING SUBMERSIBLE PUMPS
AND CONTROL COMPONENTS
SEWER LIFT STATION, JEAN LAFITTE & ELTON
JEFFERSON PARISH DEPARTMENT OF SEWERAGE**

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. GENERAL – The equipment described herein pertains to pump stations up to and including 50 Hp, three phase, 230/480 VAC and below for Jefferson Parish Department of Sewerage. The pumps, controls, and accessories shall be provided by a single supplier to insure for a completely integrated pumping and controls solution. The equipment performance and material specifications shall be used to establish a level of quality suitable for the intended service. The control system shall be capable of being integrated into the Jefferson Parish SCADA system, if so desired. That work shall be performed by Jefferson Parish Department of Sewerage personnel.
- B. Vendor shall furnish one (1), submersible solids-handling pump with integral electric submersible motors, cooled by closed loop cooling system, base elbows, and other accessories required for complete installation. Control Components shall also be furnished by the equipment supplier to insure for a fully functioning pump system. Pumps shall have discharge size and motor ratings as shown in these specifications.
- C. The Vendor shall be responsible for supplying the equipment specified herein to meet or exceed these specifications. The System Supplier shall be an Authorized Distributor of the proposed products, and shall be capable of servicing the products with repair service and parts available to the Jefferson Parish Department of Sewerage. The responsive System Supplier shall routinely stock complete pumps, controls, and parts to repair those units in their own facility. All equipment approved for this project shall meet or exceed all performance, service, and warranty requirements of this specification.

1.02 QUALITY ASSURANCE

A. Manufacturer's Qualifications

1. All equipment for this project shall meet or exceed all performance, service, and warranty requirements of this specification.
2. The solid-handling pumps must be suitable for domestic sewage, pre-treatment plant effluent, and possible storm water. The pumps shall be designed and fully guaranteed for this use. The fluid temperature range shall be from 40 degrees to 104 degrees Fahrenheit.

1.03 TESTING

A. General

Each pump shall be shop tested and field tested as specified hereinafter. All costs for the tests shall be borne by the Bidder. In the event any equipment fails to meet the performance values set forth in this specification, the equipment shall be modified and re-tested or replaced with equipment that performs in accordance with this specification.

B. Shop Tests

Each pump and motor shall be performance tested as specified hereinafter; all pumps shall be tested with motor cable to be supplied with the pumps. Three copies of certified test reports, including actual test records, shall be submitted and approved by the Engineer prior to shipment of the equipment.

Each pump shall be tested for performance at the factory to determine the head vs. capacity, motor total electrical power draw (KVA), and motor active electrical power draw (KW) for the full speed at which the pumps are specified and shown on a performance test curve, certified by a registered professional engineer, as continuous functions throughout the pump's performance range. Tests of models, prototypes, or similar units will not be accepted.

The motor and cable on each pump shall be tested for moisture

content or insulation defects. After the test, the pump cable end shall be fitted with a shrink-fit rubber boot to protect it from moisture or water.

C. Field Tests

Equipment shall be field tested as specified hereinafter. Field testing shall be composed of preliminary tests and acceptance tests. The Bidder shall provide the services of authorized equipment supplier's representatives to conduct all field tests.

1. Preliminary tests shall be run on all pumps, motors, and control systems to demonstrate that they are in proper working order.
2. Acceptance tests shall be run to demonstrate that the pumping units, motors, and control system meet the following requirements:
 - a. The pumping units operate as specified without excessive noise, cavitation, vibration, and without overheating of the bearings.
 - b. All automatic and manual controls function in accordance with the specified requirements.

1.04 PERFORMANCE

Performance Requirement	3 Hp – 4” Pumps
Minimum Shutoff Head (ft.)	36 Feet
Rating (GPM/Ft)	350 GPM@19' TDH
Maximum Active Motor Input Power at Rating (KW)	2.5 KW
Maximum Active Shaft Power at Rating (KW)	2.0 KW
Maximum Specific Energy at Rating (KWHr/MG)	122 KWH/MG
Maximum NPSHRe at Either Rating (Ft.)	13 feet
Motor Rating (HP) at 40 degrees C	3.0 Hp
Voltage/Cycle/Phase	230/460V/60Hz/3
Motor Design Type	NEMA B – Inverter
Motor Service Factor	1.15
Motor Insulation Rating	H
Maximum Pump Speed (RPM)	1700
Maximum Rated Current (A)	9.6/4.8 Amps
Minimum Rated (FL) Power Factor (%)	0.83
Maximum Starting Current (A)	44/22 Amps
Discharge Size (inches)	4-inch

*** - NOTE: Pump Suction and Discharge Must Be on Same Centerline.**

1.05 SUBMITTALS

- A. Complete assembly, foundation support, and installation drawings, together with detailed specifications and data covering pumps, motors, material used, parts, devices, and other accessories forming a part of the equipment furnished shall be submitted for approval in accordance with the procedure set forth in the General Conditions.

Data and specifications for the equipment shall include, but shall not be limited to the following:

- a. Setting Plans. Setting plans shall include:
1. Anchor bolt layout
 2. Anchor bolt dimensions
 3. Outline dimensions and weights of pumps, bases, motors, and control enclosures.
- b. Pumps. Data and drawings shall include:
1. Manufacturer, type, and model number.
 2. Assembly drawing, nomenclature and material list, O&M manual, and parts list.
 3. Type, manufacturer, model numbers, location, and spacing of bearings.
 4. Impeller type, diameter, thru-let dimensions, shredder size, number of vanes, and identification number.
 5. Complete motor performance data including: rating, voltage/phase/frequency; design type; service factor; insulation class; motor pole number; actual rotation speed when combined with the specified pumps; current, power factor, and active input power (KW) as a continuous function of shaft power from no load to at least 115 percent load, start (max. inrush) current; locked rotor current; NEC code letter; and motor torque as a continuous function through the motor start cycle from no rotation to synchronous speed.
 6. Complete performance test curve(s) showing full range (shutoff to run-out) head vs. Capacity, NPSHR, hydraulic efficiency, motor active (KW) input power, motor total (KVA) input power (Based on measured current and voltage), and shaft power (BHP). See Section 1.03B

Shop Tests.

7. Location and description of Service Centers and spare parts stock.
8. Warranty for the proposed equipment.

The manufacturer shall indicate, by arrows to points on the Q/H curves, limits recommended for stable operation, between which the pumps are to be operated to prevent surging, cavitation, and vibration. The stable operating range shall be as large as possible, and shall be based on actual hydraulic and mechanical characteristics of the units and shall meet the hydraulic performance requirements of the proposed system.

- B. Furnish shop drawings and other pertinent data to the Engineer and obtain his approval before fabrication. The drawings shall be complete with respect to dimensions, materials of construction, wiring diagrams, and all supporting engineering information.
- C. At least one month before installation, submit four (4) copies of operation and maintenance instructions to the Engineer.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, and handle items of equipment in a manner that will prevent any damage.
- B. Follow manufacturer's instructions for short term and long term storage, particularly with respect to proper lubricants and periodic rotation of shafts and bearing.
- C. Touch up shop paint to prevent corrosion.

1.07 CO-ORDINATION

- A. Co-ordinate with Department of Sewerage Lift Stations personnel to avoid interferences, and to provide for timely installation.

1.08 WARRANTY

- A. The equipment shall be warranted for a period of 18 months from shipment, or 12 months from start up, whichever occurs first.

PART 2 - PRODUCTS

2.01 Solids-Handling Pumps with Electric Submersible Motors

- A. Furnish one (1) submersible solids-handling pump. Each pump shall be equipped with radiant cooling submersible electric motors connected for operation on 230/460 volts, 3 phase, 60 hertz, and 4-wire service. Pumps shall be furnished with 60 feet of submersible cable (SUBCAB) suitable for submersible pump applications. The power cable shall be sized according to NEC and ICEA standards and also meet with P-MSHA Approval. Each pump shall be supplied with a mating 6 inch cast iron base elbow with the base drilled on an ANSI B16.1 bolt pattern on a 6 inch discharge.
 - 1. Acceptable Manufacturers will be those who meet or exceed all performance, material, warranty, and service requirements of these specifications

2.02 PUMP DESIGN

- A. The pumps for this application shall be designed to operate in a fully submerged configuration, without the need of an external cooling source. The motors and cable entry system shall be capable of complete submergence and capable of handling a liquid temperature of at least 104 degrees Fahrenheit.

2.03 PUMP CONSTRUCTION

- A. Major pump components shall be of gray cast iron, ASTM A-48, Class 35B, with smooth surfaces devoid of blow holes or other casting irregularities. Higher density cast irons (Class 40 and above) with reduced vibration dampening capacity, will not be acceptable for pump driver castings, such as stator and bearing housings. All exposed nuts or bolts shall be AISI type 316 stainless steel. All metal surfaces coming into contact with the pumped media, other than stainless steel and/or brass, shall be protected by a factory-applied spray coating of acrylic dispersion zinc phosphate primer with a polyester resin paint finish on the exterior of the pump.

Sealing design shall incorporate metal-to-metal contact between machined surfaces. Pump/Motor unit mating surfaces where watertight sealing is required shall be machined and fitted with Nitrile

or Viton Rubber O-rings. Joint sealing will be the result of controlled compression of rubber O-rings in two planes and O-ring contact of four sides without the requirement of a specific bolt torque limit.

Rectangular cross sectioned gaskets that require specific torque limits to achieve compression will not be accepted. No secondary sealing compounds, elliptical O-rings, grease or other devices shall be used.

2.04 COOLING SYSTEM

- A. Each unit shall be provided with an adequately designed integral cooling system that allows up to 10 motor starts per hour, with a partially-submerged motor, on a continuous basis in an ambient 104 degree Fahrenheit environment, and in a standard available version, with no damage to motor windings, bearings, or drive shaft seals. The pump supplied under this specification shall be suitable for continuous operation; under, partially submerged conditions. The cooling system shall be a glycol cooled, stainless steel cooling jacket system providing for dissipation of motor heat, regardless of the type of pump installation.

2.05 CABLE ENTRY SEAL

- A. The cable entry seal design shall provide strain relief and preclude specific torque requirements to insure a watertight and submersible seal. The cable entry shall consist of at least two elastomer grommets, flanked by washers; all having a close tolerance fit against the cable outside diameter, the cable entry inside diameter, and compressed by the body containing a strain relief function, separate from the function of sealing the cable. The assembly shall provide ease of changing the cable, when necessary, using the same entry seal. Epoxies, silicones, or other secondary sealing systems will not be accepted.

The cable junction chamber shall be sealed off from the stator housing and shall allow connection of the motor leads to the power cable in an isolated sealing chamber.

2.06 MOTOR

- A. Each pump shall be driven by a vertical, submersible squirrel cage induction motor, shell type NEMA B design, housed in a dry watertight

chamber. The motor and the pump shall be produced by the same manufacturer.

The stator winding shall be insulated with moisture resistant Class H insulation, rated for a temperature of 180° Celsius. The stator shall be insulated by the trickle impregnation method, using Class H monomer-free polyester resin, resulting in a winding fill factor of at least 95%. The stator shall be heat shrink fitted into the cast iron stator housing. The use of multiple step dip and bake type stator insulation process will not be accepted. The use of bolts, pins, screws, or other fastening devices used to locate or hold the stator and that penetrate the stator housing will not be accepted. The motor shall be designed for continuous duty, while handling pumped media of up to 104 degrees Fahrenheit. The motor shall be capable of withstanding at least 10 evenly spaced starts per hour. The rotor bars and short circuit rings shall be made of aluminum.

Three thermal switches shall be embedded in the stator end coils, one per phase winding, to monitor the stator temperature. These thermal switches shall be used in conjunction with, and supplemental to, external motor overload protection, and shall be connected to the motor control panel.

The motor service factor (combined effect of voltage, frequency, viscosity, and specific gravity) shall be 1.15. The motor shall have a voltage tolerance of plus or minus 10%. The motor shall be designed for continuous operation in a 40° Celsius ambient environment, and shall have a NEMA Class B maximum operating temperature rise of 80° Celsius. A motor performance curve shall be provided upon request, showing torque as a function of speed, and current, power factor, speed, input power in KW, and efficiency as a function of shaft power.

The motor shall be sized to be non-overloading when the pump is operated at any point on the pump performance characteristic curve.

Pump and motor shaft shall be a solid continuous unit. The pump shaft is an extension of the motor shaft. Couplings and shafts incorporating sleeves will not be accepted. The pump shaft shall be completely isolated from the pumped liquid.

Pump motor power cables installed shall be oil resistant chloroprene rubber jacketed, type SPC multi-conductor cable, suitable for submersible pump applications and heavy mechanical stresses. The

power cable shall also be sized according to NEC and ICEA standards and also have P-MSHA approval. The total length of each cable shall be a minimum of 60 feet long. Power cables shall each include a ground check conductor.

Motors shall be a minimum of IE3 Premium Efficiency rated.

2.07 BEARINGS

- A. The integrated pump/motor shaft shall rotate on two (2) sealed and permanently lubricated bearings. External bearing lubrication ports, which allow bearing contamination and over-packing, will not be accepted. The upper bearing, providing for radial thrust, shall be a single row, roller or ball bearing. The lower bearing shall consist of one double row angular contact bearing for combined axial and radial loads. Minimum L_{10} bearing life shall be 50,000 hours at any usable portion of the pump curve.

2.08 MECHANICAL SEAL

- A. Each pump shall be provided with dual tandem mechanical shaft seal system comprising two totally independent seal assemblies. The seals shall operate in a seal lubricant buffer chamber that hydro-dynamically lubricates the lapped seal faces at a constant rate. The inner seal, located between the lubricant buffer chamber and the stator housing, shall contain one stationary and one positively driven rotating ring, functioning as an independent secondary barrier between the pumped liquid and the stator housing. Both inner seal faces shall be corrosion resistant Tungsten Carbide (WCCR). The outer of the tandem set of seals functions as the primary barrier between the pumped liquid and the stator housing. This set shall consist of a stationary ring and a positively driven rotating ring, both of which shall be corrosion resistant WCCR.

Each interface shall be held in contact by its own spring system, supplemented by external liquid pressures. The seals shall require neither maintenance nor adjustment, but shall be easily inspected and replaceable. The lower (outer) seal shall not bear on the impeller and shall remain fixed upon impeller removal.

Upon request of the Engineer or Jefferson Parish, the pump manufacturer shall provide dry-run/leakage test procedures and data for

the specific pump shaft seal system on pumps proposed for this project.

Shaft seals without positively driven rotating members, or conventional double mechanical seals with a common single or double spring acting between the upper and lower units, requiring a substantial pressure differential to offset external pressure and effect sealing, will not be accepted, nor considered equal to the dual independent seal system specified. Cartridge-type seals comprising a single rotating element sandwiched between dual stationary elements will not be considered a dual tandem seal system and will not be accepted. Seals shall not be of the uni-directional type, but capable of dual rotation with no damage. The shaft sealing system shall be capable of withstanding volute pressures up to 1.5 times pump shutoff head. No seal damage shall result from operating the pumping unit in its liquid environment, from running pump dry, or from reverse pump operation. The seal system shall not rely upon the pumped media for lubrication.

Each pump shall be provided with a seal buffer chamber containing FDA-approved, non-toxic lubricant for the shaft sealing system. Petroleum-based oil in the buffer chamber will not be accepted. The buffer chamber shall be designed to ensure that air is left in the buffer chamber to absorb the expansion of the lubricant due to temperature variations. The drain and inspection plug, with positive anti-leak seal, shall be easily accessible from the outside.

2.09 PUMP SHAFT

- A. The pump and motor shaft shall be a single piece unit. The pump shaft is an extension of the motor shaft. Shafts using mechanical couplings will not be accepted. The shaft shall be stainless steel – ASTM A479 S43100-T. Shaft sleeves will not be accepted.

2.10 IMPELLER

- A. The impeller shall be of Hi-Chrome Iron, ASTM A532 (Alloy III A) 25% dynamically balanced, semi-open, multi-vane, back swept, screw-shaped, non-clog design. The impeller leading edges shall be mechanically self-cleaned automatically upon each rotation as they pass across a spiral groove located on the volute suction. The screw-shaped leading edges of the impeller must be capable of handling solids, fibrous materials, heavy sludge, and other matter normally

found in back wash water. The impeller to volute clearance shall be readily adjustable by the means of a single trim screw. The Impeller shall be locked to the shaft, held by an impeller bolt, and treated with a corrosion inhibitor. The design stated above shall be used, with a Brinnell hardness of at least 500.

Mass moment of inertia calculations of the rotating assembly shall be provided by the pump manufacturer upon request.

2.11 VOLUTE

- A. The pump volute shall be a single piece gray cast iron, ASTM A-48, Class 35B, non-concentric design with smooth passages of sufficient size to pass any solids that may enter the impeller. Minimum discharge size shall be 10 inches. The volute shall have an integral spiral-shaped, sharp-edged insert ring that is pressed into the suction cover of the volute. The spiral groove(s) of the insert ring shall provide the sharp edge(s) across which each impeller vane leading edge shall cross during rotation, so to remain unobstructed. The insert ring shall provide effective sealing between the multi-vane semi-open impeller and the volute. It shall be constructed of ASTM A532 (Alloy III A) 25% – Hi-Chrome Iron.

2.12 PROTECTION

- A. All stators shall incorporate thermal switches in series to monitor the temperature of each phase winding. At 140° Celsius, the thermal switches shall open, stop the motor, and activate an alarm.

USE OF VOLTAGE SENSITIVE SOLID STATE SENSORS AND TRIP TEMPERATURE ABOVE 140° CELSIUS WILL NOT BE ACCEPTED.

- B. Each pump/motor unit shall be provided with a stator leakage sensor that will sense water intrusion into the motor housing, in the event of seal failure or cable entry failure.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Inspect all equipment upon arrival at job site and prior to installation. Notify manufacturer of any damage and/or shortage.

3.02 PREPARATION

- A. Make corrections and/or repairs as required for items inspected and found deficient.

3.03 FIELD QUALITY CONTROL

- A. The manufacturer's field engineer or representative shall inspect and check the installation after erection and be on hand for initial start-up of the equipment for a period of at least three days. He shall also instruct Department of Sewerage personnel in the operation and maintenance of the system.

3.04 ADJUSTING AND CLEANING

- A. Adjust equipment as required, and within limits of manufacturer's instructions for proper alignment.
- B. Apply proper type and quantity of lubricants for short term storage or start-up operation, as applicable.
- C. Clean equipment of any foreign matter or substances.
- D. Field paint all components to be painted in accordance with manufacturer's recommendations.

3.05 PROTECTION

- A. After installation and painting, protect the equipment from any damage by work of other trades. Repair any damage that nevertheless occurs.

PART 4 – DUPLEX CONTROL PANEL COMPONENTS

4.01 SCOPE

- A. The Pump Supplier shall provide components for a Triplex Pump Control system that shall control 3 pumps in an energy conservation mode of operation. The system shall be capable of adapting to

changing inflow conditions and shall automatically regulate pumped outflow, based on inflow conditions, and shall seek optimal energy efficiency for the pump station. This shall be accomplished by either providing a Programmable Logic Controller (PLC) with Variable Frequency Drives (VFDs) to provide this adaptable feature, or Variable Frequency Drive with integral software that is SCADA ready for operation. This system will incorporate the functionality as noted in the following sections.

4.02 Electrical Control Panel Furnished by JEFFERSON PARISH

- A. JEFFERSON PARISH shall furnish a NEMA 3R stainless steel control panel that will house the equipment furnished herein to provide integral liquid level control, moisture and thermal protection modules, and/or PLC and/or VFD's, and will be provided with the minimum of the following:
- (a) Mainline lugs of the appropriate sizes shall be furnished for connecting the incoming supply power. The lugs shall be suitable for use with aluminum or copper conductors.
 - (b) Each pump motor circuit shall be protected by a properly sized E frame molded case circuit breaker. Each pole of these breakers shall provide inverse time delay overload protection and instantaneous short circuit protection by means of a thermal magnetic element. The breaker shall be operated by a toggle type handle and shall have a Quick-make, Quick-break over center switching mechanism that is mechanically trip free from the handle, so that the contacts cannot be held closed against short circuits and abnormal currents. Tripping due to overload or short circuit shall be clearly indicated by the handle automatically assuming a position midway between the manual "ON" and "OFF" position. The minimum interrupting rating of the breaker shall be 42,000 amps at 460 VAC. Pump motor circuit breaker toggle shall be operable through a cutout in the inner door.
 - (c) Hand-Off-Automatic (integral the VFD HMI) switches to select the operating mode for each pump installed on the control panel inner deadfront door.
 - (d) Elapsed time meters for each pump motor.
 - (e) In the event either pump operation selector switch is in the "Off" position, the control system software shall

automatically designate the operating pump motor as the "next pump motor to operate" after that pump motor is started.

- (f) The hinged inner door shall be provided fabricated from, 5052-H32.080, marine alloy aluminum. The hinged inner door shall contain cutouts for all circuit breaker toggles. Control switches and indicators shall be labeled and mounted to the hinged inner door to keep operators from entering the live electrical compartment. A warning sign stating "DANGER -- Disconnect All Sources Of Power Before Opening Door" shall be installed on the inner door. The inner door shall be completely removable for ease of service, and shall be held closed by at least two (2) hand operated 1/4 turn fasteners. The following items shall be mounted on the inner door:
 - (g) Pilot lights – Alarm, Pump Run, Pump Fail
 - (h) Hand-Off-Automatic – Integral to the VFD Operator Interface
 - (i) Hour meters
 - (j) Back-panel
 - (k) The control system enclosure shall include a removable back-panel. The back-panel shall be painted white and fabricated from cold roll steel.
 - (l) Components shall be fastened to the back-panel using stainless steel pinhead machine screws. All devices shall be clearly labeled in accordance with the schematic ladder diagram.
 - (m) Transient Voltage Surge Suppressors on the 120VAC circuit
 - (n) Loop Power Surge Suppressor
 - (o) Lightning Arresstor

B. Energy Management Components furnished by the Pump Supplier

- (a) A Variable Frequency Drive shall be provided for each pump in the system, sized for the appropriate voltage and power. The pump drive shall be supplied by the pump manufacturer and designed for wastewater pumping, with functionality pre-programmed for the specific pump model used, or a PLC of equivalent functionality shall be provided. The pump drive shall provide all level control functionality, hand/auto operation, pump alternation, pump over temperature monitoring, seal leakage monitoring, pump self-cleaning, sump cleaning, and pipe cleaning algorithms. The pump drive shall also include capability to monitor station inflow, pump speed, and energy consumption in order to automatically operate the pump station at optimal energy efficiency.

The pump drive shall be tested and approved in accordance with national and international standards and comply with Directive 98/37/EC, Safety of Machinery and EN60204-1.

It shall conform to the relevant safety provisions of the Low Voltage Directive 2006/95/EC and the EMC Directive 2004/108/EC, and has been designed and manufactured in accordance with the following harmonized European standards:

EN 61800-5-1: 2003	Adjustable speed electrical power drive systems. Safety requirements. Electrical, thermal, and energy.
EN 61800-3 2nd Ed: 2004	Adjustable speed electrical power drive systems. EMC requirements and specific test methods
EN 55011: 2007	Limits and Methods of measurement of radio disturbance characteristics of industrial, scientific, and medical (ISM) radio-frequency equipment (EMC)
EN60529 : 1992	Specifications for degrees of protection provided by enclosures

The variable frequency drive ampere rating shall be equal to or greater than the ampere rating listed on the motor being driven by the variable frequency drive.

- (b) The drive units shall be modularly constructed. Printed circuit boards shall be connected in such manner that they are easily removed from the unit. Power components shall be readily accessible and be connected in such manner that they are easily removed from the unit. The pump drive shall be freestanding for wall mounting or cabinet installation construction, for 230-480V, 60HZ 3Phase supply. It holds an IP55 and IP66 isolation class.

C. System Operation – VFD or PLC Functionality

a. High/Low Level Sump Control:

The pump controls system shall provide automatic level control via means of a submersible pressure transducer (4-20mADC)

and one (1) non-mercury liquid level float switch. User-programmable Start Level shall indicate the point at which the pump will start. Upon activation the pump shall run at maximum speed for a pre-determined period, then ramp down to the energy efficient Optimal speed, calculated by the pump drive. When the water level reaches the Stop Level, the pump shall stop. The Optimal Speed shall either be calculated by the pump drive or manually entered by the user.

In case of high inflow, the pump drive shall increase pump speed until the water level begins to decrease. When the water level reaches the Stop Level, the pump shall stop.

In case of very high inflow, in a duplex installation, when a single pump is unable to overcome the inflow conditions even at maximum speed, additional pumps shall be activated and run at maximum speed until the Stop Level is reached. If water levels continue to rise, a High Level Alarm shall be activated.

The pump drive shall incorporate a Minimum Speed function that prevents the pump from operating at speeds too low to move water based on the pump curve.

b. Run Time Averaging (Duplex Application Only):

In cases of duplex pumps/drives, the pump drive shall provide capability to balance run times for even wear. This shall be an internal function of the drive and not require external devices, such as an Alternating Relay. The function shall operate by determining a "random" start level, based on the Start Level setting. Each drive shall determine its own random start level independent of each other. New random start levels will be determined every 24 hours. The pump with the lowest random start level shall be first to start on any given pump cycle. The second pump shall remain in Standby capacity in case the lead pump shall not be able to lower the water level as described in the section above. By recalculating the random start levels every 24 hours, balanced run times are accomplished.

c. Pump Cleaning Function:

The Pump drive shall incorporate a "self-cleaning" function to remove debris from the impeller. The cleaning shall be triggered by three circumstances:

1. Soft Clogging: When motor current equals 20% or greater above rated motor current, in the drive, for a period of 7 seconds
2. Hard Clogging: When motor current equals 80% or greater above rated current for a period of 0.01 seconds
3. Schedule Cleaning: The pump drive is pre-programmed to perform cleaning regularly

The cleaning function shall consist of forced stopping, reversal, and forward runs - timed to allow for debris to fall from the impeller. After cleaning cycle is complete, drive shall resume to automatic operation.

d. Sump Cleaning Function:

The pump drive shall incorporate a sump cleaning function to ensure surface solids and grease is regularly removed from the sump. The sump cleaning function shall perform regularly when enabled by the operator. Sump cleaning shall consist of the following functions:

1. Sump cleaning is triggered when internal timer expires and during a normal pump down cycle
2. Pump is automatically ramped to maximum speed
3. Pump runs at maximum speed for designated time or until the pump is "snoring"
4. When Sump Cleaning is over, the pump is shut off and resumes normal operation

e. Pipe Cleaning Function:

The pump drive shall incorporate a pipe cleaning function to avoid discharge pipe sedimentation and clogging due to reduced pump speed. This shall be an automatic feature that initiates with every pump cycle. Upon reaching Pump Start Level, the drive shall operate the pump at 100% speed for a determined time before ramping down to the most energy efficient speed for the duration of the cycle.

f. Energy efficient speed finder:

The pump drive shall provide a function that automatically calculates the most energy efficient speed for the pump, based on station inflow characteristics. An algorithm calculates the optimal speed whereby the most water is pumped using the least amount

of energy. The optimal speed is constantly adjusted to account for changes in flow, without requiring operator adjustment, multiple setpoints, etc.

The energy efficient function prevents the drive from running off of the system curve for the pump. This will ensure maximum hydraulic efficiency, as well as maintain electrical efficiency.

g. Alarms & Monitoring:

The pump drive shall provide alarms and monitoring for the drive, pump, and sump. Alarms shall be presented on the LCD display, via a Summary Alarm relay and via Modbus registers. All alarms, when occurring, shall remain active until reset. Alarms shall have a built-in 4 second delay to prevent nuisance tripping. Alarms shall be as follows:

1. Pump Monitoring:
 - a. Pump Over Temperature (thermal contacts in motor stator)
 - b. Pump Seal Leak (Flygt FLS leakage sensor)
2. Sump Monitoring:
 - a. High Sump Level (via level float switch or submersible transducer)
 - b. Submersible transducer Sensor Error (Submersible transducer is not connected, reports faulty values, or the wrong start level is used)
3. Pump drive Monitoring (includes, but not limited to):
 - a. Drive Overcurrent
 - b. Drive Overload Trip
 - c. Drive Overvoltage
 - d. Drive Undervoltage
 - e. Drive Overtemperature (internal)
 - f. Drive Overtemperature (ambient)
 - g. Drive Undertemperature (ambient)
 - h. Input Phase Loss
 - i. Drive Output Max Torque Exceeded

D. Submersible Pressure Transducer

1. The liquid level of the wet well shall be sensed by a submersible level transducer. The transducer shall be a 2-wire type to operate from the level controller's regulated loop power supply, and produce an instrumentation signal (4-20mA) in direct proportion to the measured level excursion over a factory-calibrated range of zero to ten (10) feet of water.

2. The transducer shall be of the solid-state head-pressure sensing type, suitable for continuous submergence and operation. It shall be installed in accordance with manufacturer's instructions. The bottom diaphragm face of the sensor shall be installed approximately 6 inches above the wet well floor. The sensor shall be mounted using a stainless steel cable suspension system, as shown on the job plans.
3. The transducer housing shall be fabricated of type 316 stainless steel, with a bottom diaphragm 2-5/8 inch diameter of heavy-duty, limp, foul-free, molded Teflon (TM), bonded to a synthetic rubber back/seal.
4. A hydraulic fill liquid behind the diaphragm shall transmit the sensed pressure to a solid-state, variable-capacitance transducer element, to convert the sensed pressure to a corresponding electrical value. The sensed media shall exert its pressure against the diaphragm that flexes minutely, so as to vary the proximity between an internal ceramic diaphragm and a ceramic substrate, to vary the capacitance of an electrical field created between the two surfaces. A stable, hybrid, operational amplifier assembly shall be incorporated in the transducer to excite and demodulate the sensing mechanism. The transducer shall incorporate laser-trimmed, temperature compensated, high quality components and construction, to provide a precise, reliable, stable output signal, directly proportional to the sensed pressure over a factory-calibrated range.
5. The transducer element shall incorporate high over-pressure protection, and be designed to withstand intermittent overpressures five times the full-scale range being sensed. Metallic diaphragms will not be accepted, in that they are subject to damage or distortion. Sensing principles employing LVDTs, resistive, or pneumatic elements will not be accepted.
6. The internal pressure of the lower transducer assembly shall be relieved to atmospheric pressure through a heavy-duty urethane jacketed hose/cable assembly and a slack PVC bellows mounted in the control panel. The sealed breather system shall compensate for variations in barometric pressure, expansion, and contraction of air, due to temperature changes and altitude, as well as prevent fouling from moisture and other corrosive elements.
7. The transducer assembly shall be installed where directed by the Engineer, connected with other system elements, and placed in successful operation.
8. The sensor shall be suspension-mounted using a stainless steel cable

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suspension mounting kit. The mounting kit shall consist of a 2 foot long one-inch NPT type 316 stainless steel pipe with coupling, bolt, cable clamps, and hardware. The required length of 1/8 inch diameter 7 x 19 stainless steel cable shall also be provided.