City of North Augusta, South Carolina
Public Services Department
Bid Number: 2023-4290-WW387
Post Date: August 28, 2023
Close Date: September 19, 2023
Office (803) 441-4240
Fax (803) 441-4243
Website: http://www.northaugusta.net

INVITATION TO BID

FOR

MONTECELLO WASTEWATER LIFT STATION IMPROVEMENTS

The City of North Augusta will be accepting sealed bids for the item(s) listed herein. All envelopes are to be Sealed and Clearly Labeled: **Monticello Lift Station Improvements** Bids will be opened and read publicly on **September 19, 2023 at 1:30 p.m.**

Please submit in person or mail sealed bids to:
City of North Augusta
James Sutton
Director of Public Services
61 Claypit Road
North Augusta, SC. 29841

It is the intent and purpose of the City of North Augusta that this Invitation to Bid promotes competitive bidding. It shall be the bidder's responsibility to advise the Purchasing Department at the address noted in the Special Conditions, if any language, requirements, etc. or any combination thereof, inadvertently restricts or limits the requirements stated in this Invitation to Bid to a single source.

The City of North Augusta reserves the right to accept, reject or waive any and all bid documents. Bids may not be awarded on a lump sum basis to any single vendor but may be awarded to multiple vendors on a line item basis.

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I hereby propose to furnish the goods and/or services specified at the prices or rates quoted in my bid. I agree that my bid will remain firm for a period of up to sixty (60) days in order to allow the City adequate time to evaluate the bids.

I certify that all information contained in this bid is truthful to the best of my knowledge and belief. I further certify that I am duly authorized to submit this bid on behalf of the vendor/contractor as its act and deed and that the vendor/contractor is ready, willing and able to perform if awarded the bid.

I further certify, under oath, that this bid is made without prior understanding, agreement, connection, discussion, or collusion with any other person, firm or corporation submitting a bid for the same product or service; no officer, employee or agent of the City of North Augusta or of any other bidder interested in said bid; and that the undersigned executed this Bidder's Certification with full knowledge and understanding of the matters therein contained and was duly authorized to do so.

_____
Company Name

_____
Representative

_____
Company Address

_____
City, State, Zip Code

_____(_____)_____
Telephone Number

_____(_____)_____
Fax Number

_____
Email Address

1.01 System Description

A. The pump system shall be complete with all equipment specified herein, factory assembled on fabricated steel bases.

B. Principal items of equipment shall include two horizontal, self priming, centrifugal sewage pumps, V-belt drives, motors, piping, valves, motor control panel, automatic liquid level control system, and integral wiring.

C. Pump system design, pump features, valves and piping, and motor controls shall be in accordance with requirements listed under PART 2 - PRODUCTS of this section.

1.02 Performance Criteria

A. Pumps must be designed to handle raw, unscreened, domestic sanitary sewage. Pumps shall have 4" suction connection, and 3" discharge connection. Each pump shall be selected to perform under following operating conditions:

Capacity (GPM)	200
Total Dynamic Head (FT)	150

1.03 Submittals

A. Submittal shall include shop drawings, electrical ladder logic drawings, and support data as follows: Catalog cuts sheets reflecting characteristics for major items of equipment, materials of construction, major dimensions, motor and v-belt drive data, pump characteristic curves showing the design duty point capacity (GPM), head (FT), net positive suction head required (NPSHr), and hydraulic brake horsepower (BHP). Electrical components used in the motor branch and liquid level control shall be fully described.

B. Shop drawings shall provide layout of mechanical equipment and anchor bolt locations for pumps. Contractor piping connections and station access clearances shall be dimensioned relative to the station centerline. The electrical ladder logic drawings shall illustrate motor branch and liquid level control circuits to extent necessary to validate function and integration of circuits to form a complete working system.

C. Installation shall be in accordance with written instructions provided by the pump supplier. Comprehensive instructions supplied at time of shipment shall enable personnel to properly operate and maintain all equipment supplied. Content and instructions shall assume operating personnel are familiar with pumps, motors, piping and valves, but lack experience on exact equipment supplied.

D. Documentation shall be specific to the pump system supplied and collated in functional sections. Each section shall combine to form a complete system manual covering all aspects of

equipment supplied by the system manufacturer. Support data for any equipment supplied by others, even if mounted or included in overall station design, shall be provided by those supplying the equipment. Instructions shall include the following as a minimum:

a. Functional description of each major component, complete with operating instructions.

b. Instructions for operating pumps and pump controls in all modes of operation.

c. Calibration and adjustment of equipment for initial start-up, replacement of level control components, or as required for routine maintenance.

d. Support data for commercially available components not produced by the system manufacturer, but supplied in accordance with the specifications, shall be supported by literature from the prime manufacturer and incorporated as appendices.

e. Electrical schematic diagram of the pump system circuits shall be in accordance with NMTBA and JIC standards. Schematics shall illustrate, to the extent of authorized repair, pump motor branch, control and alarm system circuits including interconnections. Wire numbers and legend symbols shall be shown. Schematic diagrams for individual components, not normally repairable by the station operator, need not be included. Details for such parts shall not be substituted for an overall system schematic. Partial schematics, block diagrams, and simplified schematics shall not be provided in lieu of an overall system diagram.

f. Mechanical layout drawing of the pumps and components, prepared in accordance with good commercial practice, shall provide installation dimensions and location of all pumps, motors, valves and piping.

1.05 **Pump Design**

A. Pump shall be horizontal, self-priming centrifugal type, designed specifically for handling raw unscreened domestic sanitary sewage or industrial waste. Pump solids handling capability and performance criteria shall be in accordance with requirements listed under PART 1 GENERAL of this section. Pump shall be vertically staged incorporating a lower and upper volute casing united by a ductile iron transition chamber, allowing for a direct and smooth flow path to the impeller in the upper casing.

B. Pump suction and discharge connections of the lower casing shall be vertically inline with one another.

C. The cover plates and rotating assemblies shall be interchangeable between both casings.

D. The discharge port of the upper casing shall be capable of being rotated to allow for multiple pipe orientations.

1.06 **Serviceability**

A. Pumps to be supplied with a drain kit for ease of maintenance. The kit to contain 10' length of reinforced plastic hose with a female quick connect fitting at one end, and factory installed drain fittings in each pump. Fittings include a stainless steel pipe nipple, stainless steel bushing, stainless steel gate valve and aluminum male quick connect fitting.

B. The following minimum spare parts shall be furnished with the pump system:

a. One spare pump mechanical seal (complete with shaft sleeve).
b. One cover plate O-Ring.
c. One rotating assembly O-Ring.
d. One set of impeller clearance adjustment shims.
e. One complete rotating assembly which shall include the impeller, shaft, bearings, seal and o-rings necessary to replace any of the original pump assemblies.

1.07 **Valves and Piping**

A. Each pump shall be equipped with a full flow type check valve, capable of passing a 3" spherical solid, with flanged ends and be fitted with an external lever and spring. 316 stainless steel body ring shall be threaded into the valve port. Valve clapper shall be cast iron, rubber face, and shall swing completely clear of waterway when valve is full open. The seating shall be by a resilient field replaceable ring on the valve disc contacting a bronze or stainless seat ring in the valve body. Hinge pin shall be of 18-8 stainless steel construction and shall be utilized with bronze bushings and packing type seal. Valves shall be equipped with removable cover plate to permit entry or for complete removal of internal components without removing the valve from the line. Valve shall be rated at 175 psi water working pressure, 350 psi hydrostatic test pressure. Valves other than full flow type or valves mounted in such a manner that prevents the passage of a 3" spherical solid shall not be acceptable.

B. A 2-way plug valve must allow pump(s) to be isolated from the force main. Valve shall pass 3" spherical solids. The plug valve shall be non-lubricated, tapered type. Valve body shall be semi-steel with flanged end connections drilled to 125 pound standard. The drip-tight shutoff plug shall be mounted in stainless steel bearings, and shall have a resilient facing bonded to the sealing surface. Valve shall be operated with a single lever actuator.

C. An automatic air release valve shall be furnished for each pump designed to permit the escape of air to the atmosphere during initial priming or unattended repriming cycles. Upon completion of the priming cycle or repriming cycle, the valve shall close to prevent recirculation. Valves shall provide visual indication of valve closure, and shall operate solely on discharge pressure. Valves which require connection to the suction line shall not be acceptable.

D. All valve parts exposed to sewage shall be constructed of cast iron, stainless steel, or similar corrosion resistant materials. Diaphragms, if used, shall be of fabric reinforced neoprene or similar inert material.

E. A cleanout port, three inches in diameter, shall be provided for ease of inspection, cleanout, and service.

F. A gauge kit shall be supplied for each pump. Suction pressure must be monitored by a glycerin-filled compound gauge, and discharge pressure by a glycerin-filled pressure gauge. Gauges to be at least 4 inches in diameter, graduated in feet water column. Rated accuracy shall be 1% of full scale reading. Compound gauge shall be graduated -34 to +34 feet water column minimum. Pressure gauge to be graduated 0 to 230 feet water column minimum.

1.08 **Drive Unit**

A. Pump motors shall be 40 HP, horizontal TEFC, 1800 RPM, NEMA design B with cast iron frame with copper windings, induction type, with normal starting torque and low starting current characteristics, suitable for continuous service. The motors shall not overload at the design condition or at any head in the operating range as specified.

B. Power to pumps transmitted V-belt drive assemblies. The sheave/belt combination shall provide the speed ratio needed to achieve the specified pump operating conditions.

1.09 **Electrical Control**

A. Electrical control equipment shall be mounted within a NEMA 4X stainless steel enclosure. Door shall be hinged and sealed with a neoprene gasket and equipped with captive closing hardware. Control components shall be mounted on a removable steel back panel secured to enclosure with collar studs.

B. A properly sized heavy duty circuit breaker shall be furnished for each pump motor. The circuit breakers must be sealed by the manufacturer after calibration to prevent tampering.

C. Motor Starter: Starter: A reduced voltage, solid state motor starter shall be furnished for each pump motor. The starter construction shall be modular with separately replaceable power and control sections. The power section shall consist of six back-to-back SCR's rated 208 to 480 volts, 50/60 hertz. The SCR's shall have a minimum repetitive peak inverse voltage rating of 1400 volts at 480 volts. The enclosed operating temperature range shall be 0 to 40 degrees C at altitudes up to 2000 meters without derating.

D. Starting Modes: Starting modes shall be selectable soft start, current limit, or full voltage. Soft starting the pump shall include an adjustable initial torque value of 0 to 90 %. The acceleration ramp shall be adjustable from 0 to 30 seconds. The starter shall include a selectable kick start providing a current pulse at start. Kick start level shall be adjustable from 0 to 90% of locked rotor torque. Kick start time shall be adjustable from 0 to 2 seconds. Current limit mode shall provide means for limiting the starting current to a programmable value between 50 and 600% of full load current. Full voltage start shall provide across the line starting with a ramp time of less than 0.25 seconds.

E. Bypass: When the start ramp time is complete, the starter shall energize an integral bypass contactor. When in the bypass mode, the bypass contactor shall carry the motor load to minimize internal heating in the electrical enclosure.

F. Protection: The starter shall include protective features: Communication fault, control temperature, excess starts/hour, stall, jam, line fault, open gate, overload, overvoltage, phase reversal, power loss, underload, under voltage, shorted SCR, open bypass and voltage unbalance.

G. The control panel shall be equipped to monitor the incoming power and shut down the pump motors when required to protect the motor(s) from damage caused by phase reversal, phase loss, low voltage, and voltage unbalance. An integral time delay shall be provided to minimize nuisance trips. The motor(s) shall automatically restart when power conditions return to normal.

H. The lift station shall be equipped with a 3 KVA step-down transformer to supply 115 volt, AC, single phase for the control and auxiliary equipment. The primary and secondary side of the

transformer to be protected by a thermal magnetic circuit breaker, sized to meet the power requirements of the transformer. An operating mechanism shall penetrate the control panel door. and a padlock able operator handle shall be secured on the exterior surface. Interlocks must prevent opening the door until circuit breakers are in "OFF" position. An additional mechanism(s) shall be provided on the circuit breaker permitting the breaker to be operated and/or locked with the control panel door in the open position.

1.10 Liquid Level Control Non-Contact Radar Sensor & Alarm

A. The transducer shall be include but not limited to; FMCW radar type, emitting W-Band energy. The frequency change is proportional to distance and is converted into filling height. Variations in the filling height are converted into a linear 4-20mAdc signal. Signal processing shall filter out false reflections and other background noises.

B. Pump system supplier shall provide one 115 volt AC alarm light fixture with vapor-tight red globe, guard, conduit box, and mounting base. The design must prevent rain water from collecting in the gasketed area of the fixture, between the base and globe. The alarm light will be shipped loose for installation by the contractor.

Warranty

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

Each pump shall be, warranted for sixty (60) months to be resistant to rust, corrosion, corrosive soils, effects of airborne contamination or physical failures occurring in normal service for the period of the pump station warranty.

All other equipment, apparatus, and parts furnished shall be warranted for twelve (12) months, excepting only those items that are normally consumed in service, such as light bulbs, oils, grease, packing, gaskets, etc. The pump supplier shall be solely responsible for warranty of the pump system and all components furnished.

The manufacturer’s technical representative shall inspect the completed installation, correct or supervise the correction of any defect or malfunction, and instruct operating personnel in the proper operation and maintenance of the equipment

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DESCRIPTION	QTY	UNIT PRICE	TOTAL COST
Self Priming Pump with 40 Horsepower Motor, Complete Assembly with Base Plate Package and Heater for Outdoor Operation	2		
Automatic Air Release Valves	2		
4” Discharge Check Valve	2		
4” Discharge Isolation Valves	2		
Duplex Control Panel with NEMA 4XSS Enclosure, RVSS Starters and VEGA Radar Level Control System	1		
Manufacturers Representative System Startup	1		
		Sub Total	
		Tax	
		Freight	
		Total	**$**

COMPANY NAME: _____

REPRESENATIV3E: _____

DATE: _____

DELIVERY TIME: _____

PHONE NUMBER: _____

EMAIL: _____