

CITY OF FAIRHOPE
BID INVITATION

January 21, 2010

Sealed proposals will be received by the City of Fairhope of Baldwin County, Alabama, in the City of Fairhope offices, 555 South Section St. Fairhope, Alabama, until 2:00P.M. February 17, 2010, and then publicly opened thereafter, for furnishing all labor and materials, and performing all work required by the City of Fairhope and described as follows:

Bid Number 003-10, MATERIALS FOR LIFT STATION KEY ALLEGRO

Questions or comments pertaining to this bid must be presented in writing, sent as e-mail or faxed to the attention of the Purchasing Manager, Daniel P. Ames, P.O. Drawer 429, 555 South Section St., Fairhope, Al 36532, e-mail: dan.ames@cofairhope.com, fax number: 251-990-0125, Seventy Two (72) hours prior to the bid opening or will be forever waived.

All bids must be on blank forms provided in the Bid Documents. **BID BOND IS WAIVED.**
THERE WILL BE NO PREBID MEETING.

The City of Fairhope is an Equal Opportunity Employer and requires that all contractors comply with the Equal Employment Opportunity laws and the provisions of the Contract Documents in this regard. The City also encourages and supports the utilization of Minority Business Enterprises on this and all public bids.

All bids, with their guarantee (when required), must be enclosed in a sealed, opaque envelope, clearly identified on the outside as a "**Sealed Bid**" with **Item Name, Bid Number, City of Fairhope's Name and Address and Bidder's Name and Address**. Each bid must be in a separate envelope. Bids made out in pencil will not be accepted.

Failure to observe the instructions contained herein will constitute grounds for rejection of your bid. The City reserves the right to accept or reject all bids or any portion thereof whichever is in the best interest of the City of Fairhope.

The company that is awarded the bid must have Workman's Compensation Insurance on all of its employees if work is done on City premises. General Liability Insurance must be maintained to hold the City harmless in the event of an accident. Proof of Workman's Compensation Insurance if work is done on City premises and General Liability Insurance specifying coverage must accompany this bid packet. See specifications for details.

No bids will be considered unless the bidder, whether resident or non-resident of Alabama, is properly qualified to submit a proposal for this type of work in accordance with all applicable laws of the State of Alabama. Where applicable, this shall include evidence of holding a current license from the State Licensing board for General Contractors, Montgomery, Alabama, as required by Chapter 8 of Title 34, of the Code of Alabama, 1975. In addition, non-residents of the State if a corporation, shall show evidence of having qualified with the Secretary of State to do business in the State of Alabama. Bidder must have a current business license or purchase a business license with the City of Fairhope prior to bid being awarded.

Daniel P. Ames,
Purchasing Manager

Posted: 01-21- 2010

GENERAL REQUIREMENTS

AWARD OR REJECTION OF BIDS

1. The Bid will be awarded to the lowest responsible bidder complying with conditions of the invitation for bids, provided his bid is reasonable and it is in the interest of the City of Fairhope to accept it. The bidder to whom the award is made will be notified at the earliest possible date. The City of Fairhope, however, reserves the right to reject any and all bids and to waive any informality in bids received whenever such rejection or waiver is in the interest to the City of Fairhope.

COMPLIANCE

1. All bid components will comply with all Federal, State and Local laws, ordinances, codes and regulations.
2. The awarded vendor will be responsible for insuring that all items meet specifications before delivery.
3. Awarded vendor will make no substitutions for bid items without prior written approval of the City of Fairhope Purchasing Department.

ORDERING

1. The City of Fairhope Purchasing Department will issue Purchase Order(s) to the awarded vendor for bid items as needed.
2. If awarded vendor fails to fill Purchase Order(s) or deliver on time, the City of Fairhope reserves the option to procure needed, comparable items from any source, and bill the awarded vendor for associated expenses generated by such failure.

PACKAGING & DELIVERY

1. Deliver bid items to City of Fairhope Warehouse, 555 South Section Street, Fairhope, AL, or other designated City site, maintaining product in proper state, undamaged.
2. At point of delivery, awarded vendor will present an itemized delivery ticket **with the Purchase Order Number clearly referenced thereon**, to City of Fairhope receiving personnel for signing.
3. F.O.B. City of Fairhope, as directed.
4. Shortages, defective or damaged items will be rejected. The awarded vendor will replace such items within ten (10) working days.
5. If applicable, all titles, fees, as well as other charges, are to be paid by awarded vendor. Awarded vendor is to furnish prepaid certificate of title in the name of the City of Fairhope, Title shall change upon acceptance of delivery at the Owner approved delivery location.
6. The bidder shall give the City at least 24 hours notice (Weekends and Holidays excluded) prior to delivery on site.

WARRANTY

1. Winning Bidder will provide written warranty for all parts and labor for a period of (1) one year commencing from date of written acceptance of delivery by City of Fairhope. Winning Bidder will provide written copies of all other applicable warranties, such as, Manufacturer's warranty. Those warranties, if any, will be in addition to the Winning Bidder's warranty, and the terms of which will not be altered by the Winning Bidder's warranty.

PAYMENT

1. Invoices -- Upon completion of service and delivery of materials specified in the applicable purchase order, awarded vendor will submit an invoice and signed delivery ticket to:
City of Fairhope
Accounts Payable Department
P.O. Box 429
Fairhope, AL 36533
2. **All invoices must reference appropriate Purchase Order Numbers**
3. Payment Of Invoice: All invoices received by the City of Fairhope are payable within thirty (30) days from the date of receipt by the City of Fairhope, provided they are approved by the City of Fairhope.

If you are unable to furnish an item as specified and desire to offer a substitute, give full description of the item. No errors will be corrected after bids are opened. No prices shall include State or Federal Excise Taxes. Municipalities are exempt from Alabama Sales Tax by state law.

Any attachments hereto are made and become a part of this inquiry and must be signed by bidder.

- Our bid form must be filled in completely.
- All pages of this bid form must be returned.
- All documents requested must be attached to the back of page of such request and acknowledgement must be made where blank appears.
- A signed contractual agreement must be in place prior to beginning work or services.

I hereby affirm I have not been in any agreement or collusion among bidders or prospective bidders in restraint of freedom of competition, by agreement to bid at a fixed price or to refrain from bidding or otherwise.

Company: _____ **Date:** _____

Company Representative: _____
(Print)

Title: _____

Company Representative: _____
(Signature in ink)

THIS MUST BE NOTARIZED!

Sworn to and subscribed before me this _____ day of _____, 20__.

Notary Public

My Commission expires: _____

SCOPE OF WORK AND SPECIFICATIONS
BID NO. : 003-10
BID NAME: MATERIALS FOR LIFT STATION KEY ALLEGRO

SCOPE OF WORK

1. The Awarded Vendor to provide all necessary supervision, labor, tools, materials and safety equipment to perform the following tasks:
 - a. Provide LIFT STATION MATERIALS as per specifications, as ordered by Purchase Orders.
 - b. Deliver items to the City of Fairhope Warehouse, Fairhope Al, or other designated City site.
 - c. Provide current, applicable Material Safety Data Sheets (MSDS) with each delivery, notifying receiving personnel of any changes, replacements or revisions.
 - d. The attached specifications are intended and provided solely as a general and non-exhaustive expression of the intent and purpose of the City of Fairhope regarding this bid; said specifications should be so considered by the bidders. The use of specific names is not intended to restrict the bidder or any seller or manufacturer, but is solely for the purpose of indicating the type, size and quality of materials, product services, or equipment best suited for the City of Fairhope. Accordingly, the bidder admits and agrees that said specifications are not complete in every detail and that the work and materials not indicated or expressly mentioned in said specifications, but which are reasonably necessary for the full and faithful performance of the item(s) bid in accordance with the full and faithful intent, will be included in the bid and incorporated in the work by the bidder and at the bidder's sole expense, the same as if indicated and specified.

SPECIFICATIONS (Supplied by Water & Sewer Department)

PURPOSE:

The City of Fairhope will accept bids on LIFT STATION MATERIALS with the following minimum specifications.

TECHNICAL SPECIFICATIONS:

COMPLY YES NO

**SUBMERSIBLE LIFT STATION
FAIRHOPE, ALABAMA**

GENERAL:

Furnish two (2) submersible non-clog sewage pumps as specified herein. Each pump shall be furnished with a **12HP, 1760 RPM** submersible electric motor suitable for operation on 240 volts, 3 phase, 60 hertz, 4-wire service, a 4 inch cast iron discharge connection with anchor bolts, upper guide bar bracket, 25 feet of stainless steel lifting cable, and 50 feet of hypalon jacketed type SPC cable, P-MSHA approved and sized according to N.E.C. and ICEA standards. The pumps shall be similar to existing in the

Fairhope system and shall be Flygt Model NP3153 (OR EQUAL). Each pump shall be capable of producing following:

Primary Design Point	169 GPM @ 81' TDH
Minimum Design Point	65 GPM @ 90' TDH
Maximum Design Point	900 GPM @ 26' TDH
Horsepower (min)	12

1. PUMP DESIGN: _____

The pumps shall be automatically and firmly connected to the discharge connection, guided by no less than two guide bars extending from the top of the station to the discharge connection. There shall be no need for personnel to enter the wet-well. Sealing of the pumping unit to the discharge connection shall be accomplished by a machined metal to metal watertight contact. Sealing of the discharge interface with a diaphragm, O-ring or profile gasket will not be acceptable. No portion of the pump shall bear directly on the sump floor.

2. PUMP CONSTRUCTION: _____

Major pump components shall be of grey cast iron, ASTM A-48, Class 35B, with smooth surfaces devoid of blow holes or other irregularities. All exposed nuts or bolts shall be of stainless steel construction. All metal surfaces coming into contact with the pumpage, other than stainless steel 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. Critical mating surfaces where watertight sealing is required shall be machined and fitted with Nitrile or Viton rubber O-rings. Fittings 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 torque limit.

Rectangular cross sectioned gaskets requiring specific torque limits to achieve compression shall not be considered as adequate or equal. No secondary sealing compounds, elliptical O-rings, grease or other devices shall be used.

Each unit shall be provided with an integral motor cooling system. A motor cooling jacket shall encircle the stator housing, providing for dissipation of motor heat regardless of the type of pump installation. An impeller, integral to the cooling system and driven by the pump shaft, shall provide the necessary circulation of the cooling liquid through the jacket. The cooling liquid shall pass about the stator housing in the closed loop system in turbulent flow providing for superior heat transfer. The cooling system shall have one fill port and one drain port integral to the cooling jacket. The cooling system shall provide for continuous pump operation in liquid or ambient temperatures of up to 104°F. (40°C.). Operational restrictions at temperatures below 104°F are not acceptable. Fans, blowers or auxiliary cooling systems that are mounted external to the pump motor are not acceptable.

4. MOTOR: _____

The pump motor shall be a NEMA B design, induction type with a squirrel cage rotor, shell type design, housed in an air filled, watertight chamber. The stator windings shall be insulated with moisture resistant Class H insulation rated for 180°C (356°F). 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 motor shall be inverter duty rated in accordance with NEMA MG1, Part 31. 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 is not acceptable. The use of pins, bolts, screws or other fastening devices used to locate or hold the stator and that penetrate the stator housing are not acceptable. The motor shall be designed for continuous duty while handling pumped media of up to 104°F. The motor shall be capable of withstanding at least 15 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 junction chamber shall be sealed off from the stator housing and shall contain a terminal board for connection of power and pilot sensor cables using threaded compression type terminals. The use of wire nuts or crimp-type connectors is not acceptable. The motor and the pump shall be produced by the same manufacturer.

The motor service factor (combined effect of voltage, frequency and specific gravity) shall be 1.15. The motor shall have a voltage tolerance of +/- 10%. The motor shall be designed for continuous operation in up to a 40°C. ambient and shall have a NEMA Class B maximum operating temperature rise of 80° C. A motor performance chart shall be provided upon request exhibiting curves for motor torque, current, power factor, input/output kW and efficiency. The chart shall also include data on motor starting and no-load characteristics.

Motor horsepower shall be sufficient so that the pump is non-overloading throughout its entire performance curve, from shut-off to run-out.

5. BEARINGS:

The integral pump/motor shaft shall rotate on two bearings. The motor bearings shall be sealed and permanently grease lubricated with high temperature grease. The upper motor bearing shall be a single ball type bearing to handle radial loads. The lower bearing shall be a two row angular contact ball bearing to handle the thrust and radial forces. The minimum L₁₀ bearing life shall be 50,000 hours at any usable portion of the pump curve.

6. MECHANICAL SEALS:

Each pump shall be provided with a positively driven dual, tandem mechanical shaft seal system consisting of two seal sets, each having an independent spring. The lower primary seal, located between the pump and seal chamber, shall contain one stationary and one positively driven rotating corrosion resistant tungsten-carbide ring. The upper secondary seal, located between the seal chamber and the seal inspection chamber, shall contain one stationary and one positively driven rotating corrosion resistant tungsten-carbide seal ring. All seal rings shall be individual solid sintered rings. Each seal interface shall be held in place by its own spring system. The seals shall not depend upon direction of rotation for sealing. Mounting of the lower seal on the impeller hub is not acceptable. Shaft seals without positively driven rotating members or conventional double mechanical seals containing either a common single or double spring acting between the upper and lower seal faces are not acceptable. The seal springs shall be isolated from the pumped media to prevent materials from packing around them, limiting their performance.

Each pump shall be provided with a lubricant chamber for the shaft sealing system. The lubricant chamber shall be designed to prevent overfilling and shall provide capacity for

lubricant expansion. The seal lubricant chamber shall have one drain and one inspection plug that are accessible from the exterior of the motor unit. The seal system shall not rely upon the pumped media for lubrication.

The area about the exterior of the lower mechanical seal in the cast iron housing shall have cast in an integral concentric spiral groove. This groove shall protect the seals by causing abrasive particulate entering the seal cavity to be forced out away from the seal due to centrifugal action.

A separate seal leakage chamber shall be provided so that any leakage that may occur past the upper, secondary mechanical seal will be captured prior to entry into the motor stator housing. Such seal leakage shall not contaminate the motor lower bearing. The leakage chamber shall be equipped with a float type switch that will signal if the chamber should reach 50% capacity.

7. PUMP SHAFT: _____

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 shall not be acceptable. The shaft shall be AISI type 431 stainless steel. Shaft sleeves will not be acceptable.

8. IMPELLER: _____

The impeller shall be of gray cast iron, ASTM A-48 Class 35B, 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 shall be hardened to Rc 45 and shall be capable of handling solids, fibrous materials, heavy sludge and other matter normally found in wastewater. The screw shape of the impeller inlet shall provide an inducing effect for the handling of up to 5% sludge and rag-laden wastewater. The impeller to volute clearance shall be readily adjustable by the means of a single trim screw. The impellers shall be locked to the shaft, held by an impeller bolt and shall be coated with alkyd resin primer.

9. VOLUTE/SUCTION COVER: _____

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 inlet and discharge size shall be as specified. The volute shall have integral spiral-shaped, sharp-edged groove(s) that is cast into the suction cover. The spiral groove(s) shall provide the sharp edge(s) across which each impeller vane leading edge shall cross during rotation so to remain unobstructed. The internal volute bottom shall provide effective sealing between the multi-vane semi-open impeller and the volute.

10. PROTECTION: _____

Each pump motor stator shall incorporate three thermal switches, one per stator phase winding and be connected in series, to monitor the temperature of the motor. Should the thermal switches open, the motor shall stop and activate an alarm. A float switch shall be installed in the seal leakage chamber and will activate if leakage into the chamber reaches 50% chamber capacity, signaling the need to schedule an inspection.

The thermal switches and float switch shall be connected to a Mini CAS control and status monitoring unit. The Mini CAS unit shall be designed to be mounted in the pump control panel.

11. MIX-FLUSH VALVE: _____

One pump shall be equipped with an automatically operating valve that will provide a mixing action within the sump at the start-up of the pumping cycle.

This valve shall be mounted directly on the pump volute and shall direct a portion of the pumpage into the sump to flush and re-suspend solids and grease by the turbulent action of its-discharge. The turbulent action caused by the flow shall also provide some sump aeration benefits. The valve shall be mounted on the pump volute so that it can be removed from the sump along with the pump during normal and routine maintenance checks and shall be positioned on the volute to provide for non-clogging operation. The valve shall be equipped with an adjustable, wear-resistant discharge nozzle which shall be used to direct flow from the valve to optimize mixing action within the sump.

The valve shall not require any external power source or control to operate, neither electric nor pneumatic. The use of the external power source is not acceptable. The valve shall be suitable for use in Class I, Division 1 hazardous locations.

The valve shall open at the beginning of each pumping cycle and shall automatically close during pump operation after a pre-selected time of operation. The valve shall operate automatically by differential pressure across the valve and shall be actuated through a self-contained hydraulic system which uses an environmentally safe fluid. A method of adjusting the valve operating time shall be provided.

12. CONTROLS: _____

It is the intention that this specification shall cover a complete Duplex Pump Lift Station Electrical Control System as hereinafter described and all necessary appurtenances which might normally be considered a part of the complete electrical system for this installation. All of the automatic control equipment is to be supplied by one manufacturer. It shall be factory assembled, wired and tested and covered by complete electrical drawings and instructions.

The control system described hereafter is a Bulletin LC150/(B300)/FP1 Control System as manufactured by Siemens Water Technologies of St. Paul, MN. (OR EQUAL). The naming of a manufacturer of equipment in this specification is not intended to eliminate competition or prohibit qualified manufacturers from offering equipment. Rather, the intent is to establish a standard of excellence in the construction of and for the types of material used, and to indicate a principle of operation desired. The contractors bid shall be based on the use of Siemens Water Technologies equipment (OR EQUAL).

13. SYSTEM COORDINATION AND SINGLE SOURCE RESPONSIBILITY: _____

The equipment provided shall be a completely integrated automatic control and monitoring system consisting of the required automation and alarm monitoring equipment in a factory wired and tested assembly. The automatic control and alarm/monitoring system components shall be standard, catalogued, stocked products of the system supplier to assure one source responsibility, immediately available spare/replacement parts, proper system interconnections and reliable long term operation.

The hardware that is installed in the control and monitoring system shall be readily available. None of the hardware in the system shall be part of a discontinued line or classified as hardware that is on repair status only. The Supplier shall provide documentation verifying the continuing availability of the system hardware for full integration of the original hardware with future hardware improvements. All necessary mounting panels, stands, hangers, and brackets shall be furnished and installed and shall comply with the relevant sections of the Specifications.

14. QUALITY ASSURANCE:

The Supplier shall maintain quality in both design and workmanship as well as materials used in manufacture of equipment supplied. All equipment supplied under this Contract shall be of new manufacture.

The Supplier shall be a firm that is engaged in the manufacturing of process control systems. The system shall be in regular production with pre-designed hardware and software for process control systems. When the specification conflicts with a manufacturer's standard system, the standard system may be furnished if the intention of the specification is met.

System shall be a standard system. Custom one of a kind application software and customized hardware components will not be accepted. A standard system is defined as one which is available, at time of bid, with fully tested hardware and software, full documentation, and prepared training classes such that no development must be done beyond system configuration.

Supplier shall be responsible for detailed engineering, manufacture, programming, test, start-up and demonstration of all equipment and software programs to provide a complete operating system.

The Supplier shall have been continuously involved in the design and manufacture of control systems for the past ten (10) years. The Supplier shall have successfully built and placed into operation, systems similar to the one proposed herein and will furnish a list of at least ten (10) operating installations upon request by the Engineer. The Supplier shall have on staff a qualified instrument technicians and shall maintain a stock inventory of spare parts for all major components in the system.

The Supplier shall be responsible for engineering and implementing necessary interface between the supplied equipment and the existing equipment or interface junction boxes. Supplier shall document this interface including point-to-point wiring diagrams.

Provide all engineering and render coordination assistance, necessary for calibration of overall control system and to resolve interface discrepancies between panels, equipment, instrumentation and final control devices. Where interface conflicts exist, the Supplier shall document conflicts in writing to the City providing absolute information such as terminal numbers, device name, tests performed and diagnosis of problem.

All of the equipment listed herein shall be furnished by a single supplier.

All equipment supplied shall be of the most current and proven design at the time of delivery. The completed System and the equipment provided by the Supplier shall be compatible with the functions required and shall be a complete working System.

All electrical components of the System shall operate on 120 volt, single- phase, 60 Hertz current, except as otherwise noted in the specifications and on the drawings.

The Supplier shall be Siemens Water Technologies, St. Paul, Minnesota, or equal.

15. DOCUMENTATION: _____

The complete assembly shall be provided with job-specific wiring diagrams, parts lists, enclosure dimensional and door layout drawings and instructions.

Production Schematics shall be submitted for approval for all equipment herein specified. The Production Schematics Submittal shall include a Document List. An Order Specification shall be included which shall describe in detail the major functionality of the equipment being provided as well as components used detailed down to major component level. Each panel shall be provided with a job-specific wiring diagram, parts list, enclosure door layout and enclosure dimension drawing. Manufacturer's wiring diagrams that are not job-specific (standard drawings with options crossed out, etc.) are not acceptable. The wiring diagram requirement applies to all field mounted instrumentation and control equipment. Interconnection details shall be shown for all field mounted instrumentation. A Description of Operation shall be provided detailing the operation of the complete system, including the control and alarm handling.

Provide As-built Drawings and Instruction Manuals. These manuals shall include corrected Shop Drawings. In addition, a detailed Programming and Operations Manual for the Microprocessor-based Controller Unit shall be included. The manual shall include all information as detailed for the Shop Drawing Submittals above.

16. GENERAL EQUIPMENT REQUIREMENTS: _____

U.L. SERIALIZED LABEL

The control panel(s) shall be constructed in compliance with Underwriter's Laboratories Categories 698A and 913 standards – "Enclosed Industrial Control Panel Relating to Hazardous Locations with Intrinsically Safe Circuit Extensions" listing and following-up service. The control panel(s) shall bear the Underwriter's Laboratories serialized label for "Enclosed Industrial Control Panel Relating to Hazardous Locations with Intrinsically Safe Circuit Extensions".

Prior to shipment from the manufacturer's facility to the jobsite for installation, an Underwriter's Laboratories (U.L.) representative shall inspect the completed control panel(s). Upon successful completion of the inspection, the panel shall be assigned the required "Enclosed Industrial Control Panel Relating to Hazardous Locations with Intrinsically Safe Circuit Extensions" serialized U.L. label, indicating the equipment is built in accordance with the practices and requirements of the Underwriter's Laboratories 698A and 913 categories.

While the use of U.L. listed components is encouraged, their use alone and/or the alternate use of a U.L. 508A – "Enclosed Industrial Control Panel" serialized label will not be considered an acceptable or satisfactory alternate to the "Enclosed Industrial Control Panel Relating to Hazardous Locations with Intrinsically Safe Circuit Extensions" serialized label specified above. Upon request from the Engineer, the panel manufacturer shall supply documentation to the owner proving they are a U.L. recognized manufacturing facility for the type of equipment required. Only the labeled products of U.L. 698A and 913 "Enclosed Industrial Control Panel Relating to Hazardous Locations with Intrinsically Safe Circuit Extensions" recognized panel manufacturer shall be considered acceptable for use on this project.

17. WIRING: _____

All wiring shall be minimum 600 volt UL type MTW or AWM and have a current-carrying capacity of not less than 125% of the full load current. The conductors shall be in complete conformity with the national electric codes, state, local and NEMA electrical standards. For ease of servicing and maintenance, all wiring shall be color coded. The wire color code shall be clearly shown on the drawings, with each wire's color indicated.

In addition, the equipment wiring shall be permanently marked with wire numbers that correspond to the system schematics. The numbering convention shall comply with the municipal industry standard.

All control wiring shall be contained within plastic/PVC wiring duct with covers. Where dimensional constraints prevent the use of wiring duct, wires shall be trained to panel components in groupings. The wire groupings shall be bundled and tied not less than every 3 inches with nylon self-locking cable ties as manufactured by Panduit or equal.

18. INCOMING SERVICE AND LIGHTNING ARRESTOR: _____

The service pole and metering will be done ahead of the lift station control panel as provided by the local electrical utility company. The lift station control panel shall be service entrance rated. Conduit and wiring between the power company termination and the lift station shall be furnished and installed by the City of Fairhope. The utility power will be 240 volts, 3 phase, 4 wire, 60 Hertz.

A lightning arrestor shall be supplied in the control system and connected to each line of the load side of main power disconnect. The arrestor shall protect the control system against damage as the result of transient voltage surges caused by lightning interference, switching loads and power line interference's. It shall begin shunting to ground at 1000 volts maximum.

All metering shall be done ahead of the main disconnect and control panel. The meter shall be installed by the City of Fairhope in accordance with local power company requirements.

Each panel shall be supplied with a properly sized control power circuit breaker and control power transformer (where necessary). The breaker shall supply power to all control wiring within the enclosure.

19. NAMEPLATES: _____

All major components and sub-assemblies shall be identified as to function with laminated, engraved bakelite nameplates, or similar approved means.

20. CONTROL SYSTEM AND CONTROL PANEL: _____

20.1 ENCLOSURE:

The described equipment shall be housed in a NEMA Type 4X, stainless steel, enclosure. The enclosure door shall be provided with a 3 point padlock-able latch and aluminum dead front operator's inner door. This weatherproof, rain-tight enclosure shall be designed specifically for mounting in an unprotected outdoor location. It shall have a gasketed, hinged, front weather door with locking capability and an internally mounted hinged dead front panel so that all the components normally actuated by Operating Personnel are accessible

without opening the dead front and yet are not exposed to the elements or to unauthorized personnel. The enclosure shall be supplied with 18" floor stand kit and louvered skirts made of the same material as the enclosure to cover incoming conduit.

20.2 INCOMING POWER CIRCUIT INTERRUPTS: ___ ___

The control panel shall include a thermal magnetic main circuit breaker to provide an incoming power disconnect means and short circuit/overcurrent protection for the control panel equipment

The circuit breaker must have a minimum ampere interrupting capacity of 25,000 @ 240 volt symmetrical RMS amps. The circuit breaker shall be operable through the operator's door of the enclosure and shall have a trip rating to allow full voltage starting and continuous operation of the motors. The circuit breaker shall be a Square-D FAL Line (OR EQUAL).

The commercial power input to the control panel/main breaker shall be UL service entrance rated and labeled.

20.3 CONTROL POWER TRANSFORMER: ___ ___

The control panel shall include a control power transformer for converting the high voltage incoming three phase service to 120 VAC single phase power. The 120 VAC power shall be used to power internal control components. The control power transformer shall be rated for 230/460-120 VAC single phase at 500VA with Class 105 Deg. C insulation and shall be UL Listed. The control power transformer shall be supplied with primary and secondary fusing.

The control power transformer shall be of single epoxy resin impregnated construction to eliminate the possibility of moisture, dust, dirt, and industrial contaminants from affecting operation and shortening transformer life. The unit shall have integrally molded barriers between terminals and transformer to protect against electrical creepage.

20.4 PHASE FAILURE/UNDERVOLTAGE PUMP PROTECTION: ___ ___

Independent power monitors shall be provided on the load side of the pump disconnects to monitor incoming voltage and provide protection to the motors. These power monitors shall detect incoming service abnormalities including phase-loss, unbalance, reversal, over voltage, under-voltage and rapid cycling protection and provide automatic cutout of pumps and provide local alarm. Upon detection that incoming power has returned to normal, the unit will restore pump operation and discontinue alarm. This device shall have a nominal 2-4 second dropout delay and (2-300 second) adjustable restoration time delay.

The power monitor shall have built in dual color LED indicator. The indicator shall be green when system is normal and shall turn red upon detection of improper single or three phase power. The unit shall protect itself from voltage spikes and transients with internal transient protection meeting IEEE 587 standards.

The power monitor system shall also include a stagger time delay function providing time delay between lead and lag pump start to eliminate simultaneous

starting of motors upon return of system power. This feature shall be in operation in all modes of pump operation.

20.5 BRANCH CIRCUIT BREAKERS AND MOTOR STARTERS: ___ ___

A thermal magnetic circuit breaker shall be supplied as branch circuit protection for each pump motor. The circuit breaker must have a minimum ampere interrupting capacity of 25,000 @ 240 volt symmetrical RMS amps. The circuit breakers shall be operable through the operator's door of the enclosure and shall have a trip rating to allow full voltage starting and continuous operation of the motors. The circuit breaker shall be a Square-D FAL Line (OR EQUAL).

A NEMA rated, full-voltage, across-the-line magnetic motor starter with ambient-compensated, quick-trip class 10 overload sensing for submersible pumps in each phase to provide over current and running protection shall be provided for each pump motor. The overload trip setting shall be operator adjustable within normal pump operating ranges. Operator's door mounted, electronic overload reset push-buttons shall be provided (Mechanical O.L. operators are not acceptable). Motor Starters shall be of the same manufacture as the circuit breaker provided for the pumps.

120 VAC control power for each motor starter coil and H-O-A selector switch shall be provided.

A control power circuit breaker shall be provided and operable through the operators door of the control panel to provide a disconnect means and short circuit protection for any 120 VAC (or less) devices not powered from motor starter circuits.

20.6 PUMP CONTROL SELECTOR SWITCHES & "RUN" LIGHTS: ___ ___

The control panel shall have three position selector switches mounted on the front door for Hand-Off-Auto operation of each pump. In the Hand position the motor shall be called to operate. In the Off mode the motor shall not be allowed to operate. In the Auto mode, the motor shall operate in response to control signals from the controller.

An operator's door mounted, 30.5mm diameter, NEMA Type 4X selector switch(s) shall be industrial rated heavy duty NEMA Type 4X with modular contact block assemblies. Contact Blocks shall be stacking screw together type with parallel double break contacts with wiping action. Contact blocks shall be rated NEMA A600, 600 Volt, 10A continuous duty, 7200VA make, 720VA break AC. Contacts shall have compression type screw terminals with self lifting spring washers to insure that the wire remains secure even under sever vibration. Snap together contact blocks are not acceptable. All pilot devices specified herein are to be Square D Class 9001 Type SK Line (OR EQUAL).

Unless specified otherwise, Selector Switch(s) shall be of the maintained position.

An operator's door mounted, 30.5mm diameter, NEMA Type 4X, pilot light with a "Green" lens and a replaceable bulb shall be provided for each pump to indicate a "pump running" condition. All pilot devices specified herein are to be Square D Class 9001 Type SK Line (OR EQUAL).

20.7 PUMP RUNNING TIME METERS: _____

An operator's door mounted, 120 VAC powered running time meter measuring hours and tenths and hundredths of hours of operation up to 99999.99 hours shall be furnished for each pump motor indicated.

20.8 LIQUID LEVEL RESPONSIVE PUMP/ALARM CONTROLLER: _____

The PUMP CONTROL – TELEMETRY UNIT shall be furnished for monitoring and automatically controlling the lift station pumps in a pump down mode of operation in response to a Level process variable as based on preconfigured setpoints. Unit shall be capable of communicating station status and alarms to a master station via (Dedicated Leased Voice Grade Phone Line/VHF/UHF/Spread Spectrum) communications. The master station will be future.

The PUMP CONTROLLER – TELEMETRY UNIT shall be a standard, catalogued product of a water and wastewater pumping automation equipment manufacturer regularly engaged in the design and manufacture of such equipment. The PUMP CONTROLLER – TELEMETRY UNIT shall be specifically designed for water and wastewater pumping automation utilizing built-in preconfigured control and telemetry strategies allowing pump up or down mode pump control of 1 to 3 pumps. "One of a kind" systems using custom software with a generic programmable controller will not be acceptable.

The operating program shall be resident in non-volatile FLASH memory and include full-scale ranging and pump-up/down determination. The controller shall be arranged to operate up to three (3) pumps plus high and low (analog) alarms. The ON and OFF adjustments of each pump and alarm setpoint shall be full-range adjustable through use of an authorized operator access code and a keypad. The controller display shall show the operation of each control stage.

The controller shall include keypad adjustable on-delay timing logic to provide staggered pump starting following a power failure condition. Keypad adjustable off delay timing for each pump control stage shall provide smooth transition between control stages.

The PUMP CONTROLLER – TELEMETRY UNIT shall be able to operate on either 120 AC or 10–30 VDC power sources. The unit shall be battery backed to provide continued system monitoring and alarm annunciation in the event of primary power failure. Unit shall have built in battery charging circuitry to maintain and charge battery. Battery shall be sized to provide a minimum of 4 hours of back up power. Back up battery power will extend to necessary process sensors, local alarm lights, horns and telemetry equipment. A power on LED shall be built on board providing local indication that power is available to the unit.

The PUMP CONTROLLER – TELEMETRY UNIT shall be furnished with a user friendly "View-At-A-Glance™" (OR EQUAL) operator interface allowing adjustment and viewing of all system parameters and status. The operator interface shall be suitable for front door mounting including locations requiring wash-down and moisture protection.

- The process variable signal, Pump 1, 2, & 3 On/Off and High & Low Setpoints, shall be displayed simultaneously via front panel mounted long lasting Ultra Bright LED bar graphs. These bar graphs shall be vertically mounted in parallel fashion to provide relational viewing of all setpoints vs. the measured process. Each display column shall have a minimum of 40 segments of resolution. Each

setpoint column shall have a status LED mounted on top of the associated setpoint providing indication of setpoint activation status. Units that require operator action to view the above parameters are not acceptable.

- To assure the highest resolution and accuracy, the process display shall be configured to display the full range of the actual measured process. Range can also be offset allowing display of a pressure or level range that does not start at zero. The display ranges shall be field configurable.
- System Pump On/Off and Alarm setpoint parameters shall be easily adjustable via individual up and down pushbutton arrows located next to the associated setpoint display column(s).
- The unit shall have a built in process simulation capability allowing the operator to verify system operation by forcing the process variable up or down via pushbutton arrows located next to the process display. To prevent accidentally leaving the unit in simulation mode, the PUMP CONTROLLER shall be configured to automatically restore monitored process display within 2 minutes after last keypad usage or immediately upon operator initiated restore.
- The display unit shall incorporate a high contrast LCD panel allowing for viewing of higher level functions including the following:
 - Process display to XX.X of the full scale process range.
 - Time and Date Stamped Alarms & Events
 - Pump Statistics (Including Run Time, Number Of Starts, Daily Average Number Of Starts)
 - System diagnostics
 - Controller Security
 - Unauthorized Station Entry Detection

The PUMP CONTROLLER – TELEMETRY UNIT shall provide on board 24 VDC loop power output for external loop powered sensor. A built-in Analog Supply Voltage Status LED shall indicate availability of loop power. Unit shall be able to monitor a user selectable – 4-20 mA or 0-10 Volt analog input representing the process to be controlled. The analog digital conversion shall not be less than 16 bit to allow accurate measurement of the process variable. The analog input circuitry shall provide optical isolation from the main board to the field device. A minimum of 1000 volts electrical isolation shall be required. The Analog process signal shall be displayed locally via 40 segment vertical LED display and the LCD digital display as specified above. This signal shall also be available for telemetry transmission.

The PUMP CONTROLLER – TELEMETRY UNIT shall have the ability to monitor up to 16 digital inputs to be used to provide monitoring of local station status. Each discrete input shall provide optical isolation from the main board to the field device. A minimum of 1500 volts electrical isolation shall be required. An on board LED shall be provided indicating that digital Input isolation is not compromised. All discrete inputs shall be available for telemetry transmission. The following inputs shall be monitored:

- Pump 1, 2, 3 Run – This signal shall be used to provide local display of pump run status, pump total run time, pump average daily starts. For each pump.
- Pump 1, 2, 3 In Auto – This signal shall be used by the controller to determine pump availability. A pump in this mode cannot be called into operation.
- Pump 1, 2, 3 High Temperature/Seal Failure – This signal shall be used by the controller to disable the pump required when a High Temperature is the cause of the failure, and provide local alarm display. Controller shall be able to differentiate alarm. A Seal Failure shall not disable pump operation.

- High & Low Float/Pressure – This signal shall be used by the controller to provide back up control of the pumps in the event of primary (analog) sensor failure.
- Pump Inhibit – This signal shall be used by the controller to inhibit pumps from operating.
- Power Quality – This signal shall be used by the controller to disable pumps in the event incoming station power is unsuitable for use as determined by an optional external power monitoring device.
- Door Switch & Door Acknowledge– These signals shall be used by the controller to monitor station access as detected by an optional external door/limit switch an optional external alarm disabling switch.
- Alarm Silence – This signal shall be used by the controller to monitor an optional external silence push button and will temporarily disable the alarm horn output.

The PUMP CONTROLLER – TELEMETRY UNIT LCD shall operate in a manual scrolling menu mode with the various displays shown in sequence as selected by the keypad's up/down arrow keys. The display shall indicate the specific function entered on the keypad to confirm that selection of a particular output or other function from the keypad during adjustment or review routines.

The PUMP CONTROLLER – TELEMETRY UNIT shall be protected from unauthorized changes via built-in system security. The unit shall support 3 levels of security in a hierarchical structure allowing different levels of access to the PUMP CONTROLLER for differentiation of desired access levels to include Operator, Maintenance, & Supervisory access levels.

The PUMP CONTROLLER – TELEMETRY UNIT shall provide outputs for interface to local pumps and alarm annunciation equipment. Relay isolated contact outputs for activation of Pump 1, Pump 2, Pump 3, Common Alarm and Alarm Horn shall be provided. Each contact shall be rated for a minimum of 10 amps at 120 VAC or 5 Amps at 240 VAC. Open collector outputs for Low and High Level Alarm shall be provided for interface to off board monitoring equipment. Open collector outputs shall have a minimum operating range of 5-30 VDC @ 100 mA.

The PUMP CONTROLLER – TELEMETRY UNIT shall provide s 4-20 mA output signal for interface to external equipment including VFDs, Chart Recorders or other monitoring devices. Analog output can be configured to provide output representing process variable for retransmission or as a process control output for interface to VFDs, Valves, or other process controlled device.

The PUMP CONTROLLER – TELEMETRY UNIT shall support contact closure inputs from float or pressure switches representing high and low (*Level/Pressure*). The PUMP CONTROLLER – TELEMETRY UNIT shall annunciate these inputs as alarms and use them to provide back up control in the event the primary (analog) sensor fails. Unit will provide local alarm indication and utilize the inputs to cycle pumps on and off to maintain system operation.

The PUMP CONTROLLER – TELEMETRY UNIT shall have built-in standard operator adjustable alternation functions allowing for sequencing and equalizing wear of the pumps. The following alternation sequences shall be supported.

- Fixed
- Rotary
- First On First Off (FOFO)

- Utilize One Favor Others (UOFO)
- Emergency Mode

The PUMP CONTROLLER – TELEMETRY UNIT shall include built-in Pump Failure detection logic. In the event the pump has been called into operation and the pump run signal is not received within a pre-adjustable time period. A motor failure shall be produced. The failed motor shall be disabled, an alarm shall be displayed and the next available pump based on the selected alternation sequence shall be requested to start.

The controller shall include built in site intrusion detection logic that will monitor an external sensor (motion sensor, door switch, etc.) and allow authorized access to the station via controller keypad entry of proper security code or access level. The intrusion system upon detection of entry, will allow a preset amount of time for the operator to go the controller keypad and enter the proper code. When the operator logs out and leaves the facility, the controller shall allow a preset amount of time for the operator to get out before re-arming.

In addition to the pump and alarm control capability, the controller shall provide alarm annunciation. The controller shall upon the occurrence of an alarm sound an audible device and flash the alpha-numeric display. The display will indicate the alarm description, complete with the time and date of the alarm occurrence. An acknowledge pushbutton shall be provided to allow silencing of the audible device while the digital display will continue to show the alarm function, complete with time and date information, until the condition has cleared. A built-in alarm and status historian shall retain the last 100 time and date stamped events providing a historical record of recent activity.

The PUMP CONTROLLER – TELEMETRY UNIT shall include a volumetric lift station flow and pump performance monitoring capability allowing station flow measurement without the use of an in line flow meter. In addition to flow measurement, the PUMP CONTROLLER shall provide pump performance related information. Pump station flow and pump performance data shall be viewable locally through built in LCD or available for telemetry transmission to master station. The following information is to be provided:

- Average Station Influent Flow Rate
- Maximum Station Influent Rate (K Gal) w/Date & Time
- Current Day Total Effluent Flow (K Gal)
- Previous Days Total Effluent Flow (K Gal)
- Average Daily Effluent Flow (K Gal)
- Maximum Daily Effluent Flow (K Gal) w/Date & Time
- Total Station Effluent Flow (K Gal)
- Average Flow Rate Pump 1, 2, 3 Over All Cycles (GPM) – Each Pump
- Average Flow Rate Pump 1, 2, 3 Over Last Three Cycles (GPM) – Each Pump
- Total Flow Pump 1, 2, 3 (K Gal) – Each Pump
- Flow Rate Pumps 1, 2 (K Gal)
- Flow Rate Pumps 1, 3 (K Gal)
- Flow Rate Pumps 2, 3 (K Gal)
- Flow Rate Pumps 1, 2, 3 (K Gal)
- Pump 1, 2, 3 Low Flow Rate Alarm (Setpoint) – Each Pump
- Pump 1, 2, 3 Run Time – Each Pump
- Pump 1, 2, 3 Number Of Starts – Each Pump

- Pump 1, 2, 3 Average Number Of Starts – Each Pump

The PUMP CONTROLLER – TELEMETRY UNIT shall have one (1) RS-232C serial communications port that shall be available for telemetry communications. The RS-232 serial port shall support open communication standards including as a minimum, MODBUS RTU or ASCII and USFilter Open. Unit shall support communication data rates of 1,200 to 38,800 baud rates. On board communication diagnostic LEDs shall be available to provide indication of communications activity for verification and troubleshooting.

Unit shall be constructed for industrial applications for use in harsh environments. Unit shall have a Temperature Operating range of -40 to + 85 Deg C, and be able to operate in environments with 10-90% non condensing humidity. Unit shall be UL Listed and in compliance with FCC part 15 Class A emissions and CE IEC61000 Surge Withstand certifications.

All connections shall be made via plug-in terminal blocks with a minimal rating of 10 Amps, 300 Volts and capable of accepting 30-12 AWG wire.

It is the intention of this specification that a standard controller/transceiver be provided, with all of the control and communications features described as a fully-integrated assembly. The controller shall be a U.S. Filter Control Systems LC150.

20.9 SUBMERSIBLE LEVEL TRANSDUCER:

The liquid level of the wet well shall be sensed by a submersible level transducer. The transducer shall be a 3-wire type to operate from the level controller's regulated supply voltage and produce an instrumentation signal in direct proportion to the measured level excursion over a factory-calibrated range of zero to 10 feet of water.

The transducer shall be of the solid-state head-pressure sensing type, suitable for continuous submergence and operation and 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 in a location and as shown on the job plans.

The transducer housing shall be fabricated of type 316 stainless steel with a bottom diaphragm 2-5/8" diameter of heavy-duty, limp, foul-free, molded Teflon (TM) bonded to a synthetic rubber back/seal.

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.

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 shall not be acceptable in that they are subject to damage or distortion. Sensing principles employing LVDTs, resistive or pneumatic elements shall not be acceptable.

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 and expansion and contraction of air due to temperature changes and altitude as well as prevent fouling from moisture and other corrosive elements.

The transducer assembly shall be installed where directed by the Engineer and connected with other system elements and placed in successful operation.

The sensor shall be suspension-mounted using a US Filter Control Systems Stainless Steel Cable Suspension Mounting Kit (OR EQUAL). The mounting kit shall consist of a 2' 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.

20.10 REDUNDANT LIQUID LEVEL RESPONSIVE HIGH LEVEL ALARM/PUMP CONTROL:

An independent high level alarm and redundant pump control capability with features as hereinafter listed shall be provided in addition to the specified primary control system. It shall be powered by a 120 VAC circuit breaker.

The independent alarm/control panel equipment shall be designed to UL Industrial Control Panel standards and shall incorporate 120 VAC input power transient protection, a fused primary and a DC power supply with limited 12 VDC to power the intrinsic safety barrier level sensing float circuit(s). The front face of the controller accessible through the operator's door and shall incorporate four red LED indicators; a "control hold" LED, a redundant control "turn on" LED, a high level alarm/monitor LED, a "control contacts" energized LED and a pump "off delay" time control adjustment with a 0-5 minute range.

The redundant controller shall operate in conjunction with necessary direct-acting float switches (as specified elsewhere) to provide back up control of lift pumps, detection of high level and to protect the pumps from damage that may result from low wet well levels. The system shall monitor the float switch inputs and provide local indication of system operation via LEDs. Built in relay contacts shall be interfaced to alarm circuitry and pump motor starter pilot circuitry. The back up system shall not interfere with primary controller operation when wet well levels are within normal operating range. The back up system will only become active, and bypass the primary control and sensor system and assume full control, in the event wet well levels go outside of normal operating range. Back up sensors shall be mounted and configured to operate outside primary controller setpoint settings.

Upon detection of abnormally high wet well level the back up system shall provide independent dedicated high level alarm indication and contact closure output for activation of common alarm system. The back up system shall also provide independent dedicated control output active indication and dual isolated outputs

An operator's door mounted 120 VAC duplex ground fault interrupter (GFI) type, convenience receptacle rated at 15 amperes shall be supplied for the operation of a trouble light, drill, etc. It shall be protected by a separate 15 ampere trip rated circuit breaker accessible from the operator's door.

20.14 LOCAL ALARM SYSTEM: _____

A top mounted weatherproof, strobe alarm indication light assembly with shatter resistant polycarbonate red lens mounted on a polycarbonate/ABS blend case shall be provided. The alarm light shall be NEMA 4X rated, suitable for indoor or outdoor mounting and operate on 120 VAC and be PLC rated. The strobe tube shall provide a minimum of 300,000 peak candela output and shall be rated for 3,000 hour life.

The alarm light shall flash upon occurrence of an alarm condition.

20.15 CONDENSATION PROTECTIVE HEATER: _____

A 100 watt, 120 VAC condensation protective heater and adjustable high temperature cutout thermoswitch shall be supplied in the control panel. The heater's surface area for heat dissipation shall be large enough to prevent a skin burn (if an operator's hand should inadvertently come in contact with the unit when energized).

20.16 OVER-TEMPERATURE PUMP PROTECTION & PUMP SEAL FAILURE ALARM: _____

Over-temperature protection shall be provided in the control panel to operate in conjunction with the over-temperature switch in each pump motor. The control shall provide pump operation lockout upon the occurrence of high temperature.

The circuitry shall also include a 30.5mm diameter, NEMA Type 4X, red "pump overtemp" shutdown alarm indicating light (with front replaceable bulb) and a 30.5mm diameter, NEMA Type 4X, manual reset push-button on the operator's door for each pump motor. All pilot devices specified herein are to be Square D Class 9001 Type SK Line (OR EQUAL).

An operator's door mounted 30.5mm diameter, NEMA Type 4X, red seal fail alarm light (with front replaceable bulb) and a panel mounted seal leakage relay (to operate with the pump seal leak sensor) shall be provided to indicate a pump seal failure alarm condition for each sewage pump. The seal leakage relay shall be of solid state design incorporating LED for visual indication of sensor activation. Unit shall include built in low voltage sensor and electrical surge protection. Unit shall be CSA approved and UL recognized. All pilot devices specified herein are to be Square D Class 9001 Type SK Line (OR EQUAL).

20.17 FIBERGLASS BASINS: _____

1. Unless otherwise indicated, the plastic terminology used in this specification shall be in accordance with the definitions given in American Society for Testing and Materials (ASTM) designations D3299-81. This specification is for the hand lay-up, chopped spray technique and filament wound methods for manufacturing of vertical underground fiberglass

basins. Other methods of manufacturing shall not be acceptable.

2. The resin used shall be of a commercial grade and shall be evaluated as a laminate by test or determined by previous service to be acceptable for the environment. The resins used may contain the minimum amount of fillers or additives required to improve handling properties. Up to 5% by weight of thixotropic agent which will not interfere with visual inspection may be added to the resin for viscosity control. Resins may contain pigments and dyes by agreement between fabricator and engineer, recognizing that such additions may interfere with visual inspection of laminate quality.
3. The reinforcing material shall be a commercial grade of glass fiber having a coupling agent which will provide a suitable bond between the glass reinforcement and the resin.
4. The laminate shall consist of an inner surface, an interior layer, and a filament-wound structural exterior layer of laminate body.
5. The inner surface shall be free of cracks and crazing with a smooth finish and with an average of not over two pits per square foot, providing the pits are less than 1/8" in diameter with not over 1/32" deep and are covered with sufficient resin to avoid exposure of inner surface fabric. Some waviness shall be permissible as long as the surface is smooth and free of pits. Between 0.100 and 0.020 inches of resin-rich surface shall be provided.
6. A minimum of 0.100 inch of the laminate next to the inner surface shall be reinforced with 30% by weight of chopped-strand fiber having fiber lengths from 0.5 to 2.0 inches.
7. Subsequent reinforcement shall be continuous-strand roving fiberglass. The thickness of the filament-wound portion of the tank shell shall vary with the tank height to provide the aggregate strength necessary to meet the tensile and flexural requirements. If additional longitudinal strength is required, the use of other reinforcement, such as woven fabric, chopped-strand mat, or chopped strands shall be interspersed in the winding to provide additional strength. Glass content of this filament-wound structural layer shall be 50 to 80% by weight. The exterior surface shall be relatively smooth with no exposed fibers or sharp projections. Hand work finish shall be present to prevent fiber exposure.
8. The tank walls must be designed to withstand wall collapse based on the assumption of hydrostatic type loading by backfill with a density of 120 lb./cu.ft. The tank wall laminate must be constructed to withstand or exceed two times the assumed loading for any depth of basin.
9. For the tank bottoms, subsequent reinforcement shall be of 1.5 oz./sq.ft. chopped strand fiber or woven roving to a thickness to withstand applicable hydrostatic uplift pressure, with a safety factor of 2. In saturated conditions, the center deflection of any empty tank bottom shall be less than 3/8" (elastic deflection) and will not interfere with bottom pump mounting requirements nor rail system.

10. The width of the first layer of joint overlay shall be 3" minimum. Successive layers shall uniformly increase in width to form a smooth contour laminate that is centered on the joint $\pm\frac{1}{2}$ ". A highly filled resin paste may be placed in the crevices between joined shall be roughened to expose glass fiber. This roughened area shall extend beyond the lay-up areas so that no reinforcement is applied to an unprepared surface. Surfaces shall be clean and dry before lay-up. The entire roughened area shall be coated with resin after joint overlay is made.
11. The finished laminate shall be as free as commercially practicable from visual defects such as foreign inclusions, dry spots, air bubbles, pinhole, pimples, and delamination.
12. The surfaces shall be relatively smooth, hand finish is acceptable, with no exposed fibers or sharp projections.
13. Tanks shall be mounted on cradles if shipping is horizontal, or on a suitable skid or pallet if shipping in the vertical position. The tank shall be secured to the cradles or skid so that there can be no movement of the tank in relation to the skid or cradle under normal handling.
14. The tank bottoms shall extend past the tank walls so that the O.D. is approximately 4" larger in diameter than the O.D. of the sidewalls. This larger diameter shall serve as an anti-flotation flange. Anti-flotation flange shall not require bolt holes to secure the tank to the concrete pad.
15. Both tanks shall include link seals and the type discharge fittings shown on the plans. The wet-well tank shall include a caulking type bolt-on thermoplastic influent hub for mounting in the field. The hub shall be beveled approximately three degrees to accommodate gravity pipe coming in from various angles. The influent hub shall have a textured surface in order to provide better caulking adhesion. The valve vault tank shall include link seal fittings. Both tanks shall include a 3" NPT fitting for the valve box drain.
16. The top flange and cover O.D. shall assure a tight fit and afford ease of access not possible with recessed covers. Noncorroding stainless steel heli-coils shall be inserted in all bolt holes of the top flange and shall be positively locked with threads and resin to prevent stripping. A 10-hole pattern shall accommodate the mounting of the cover.
17. Covers shall be of aluminum with an O.D. equal to the O.D. of the top flange on the basin. Cover shall be secured by stainless steel bolts. Covers shall be designed for live load of 300 lb./sq.ft.

21.00 PUMP TEST:

The pump manufacturer shall perform the following inspections and tests on each pump before shipment from factory:

1. Impeller, motor rating and electrical connections shall first be checked for compliance to the customer's purchase order.

2. A motor and cable insulation test for moisture content or insulation defects shall be made.
3. Prior to submergence, the pump shall be run dry to establish correct rotation and mechanical integrity.
4. The pump shall be run for 30 minutes submerged, a minimum of six (6) feet under water.
5. After operational test No. 4, the insulation test (No. 2) is to be performed again.

A written report stating the foregoing steps have been done shall be supplied with each pump at the time of shipment upon request.

The pump cable end will be sealed with a high quality protective covering, to make it impervious to moisture or water seepage prior to electrical installation.

22.00 SITE TEST: _____

The pump shall be tested at start-up and voltage, current, and other significant parameters recorded. The manufacturer shall provide a formal test procedure and forms for recording data. Only factory certified service personnel shall perform start-up service. Proof of certification shall be required prior to equipment approval.

PUMP WARRANTY

The pump manufacturer shall warrant the units being supplied to the owner against defects in workmanship and material for a period of five (5) years or 10,000 hours under the Municipal Wastewater - Permanent Installation Warranty Policy.

23.00 DOCUMENTATION: _____

Awarded Vendor will supply five (5) sets of detailed standard submittal drawings, Operation and Maintenance instruction manuals and parts list. Standard submittals will consist of:

- a) Pump Outline Drawing
- b) Control Data
- c) Access Frame Data
- d) Typical Installation Guides

Parts Lists and Technical Manuals shall be supplied after start-up has been completed.

24.00 EXPERIENCE CLAUSE: _____

The pump manufacturer shall have a minimum of 1,000 units of similar type pumps, installed and operating for no less than five (5) years in the United States.

26.00 SERVICE: _____

The pump supplier shall employ factory trained service personnel. These persons shall be authorized by the manufacturer to perform all maintenance and repair work on the above pumps. Factory certification of service personnel shall be provided to the engineer prior to approval of pumps. Only factory certified personnel shall perform start up on the specified material. The supplier shall also maintain a factory trained service personnel within 20 miles of the jobsite. Suppliers which cannot perform factory warranty work in their own service facility shall not be considered. Proof of such facilities shall be furnished to the City of Fairhope.

27.0 VENDOR COMPLIANCE

27.01 Items bid must comply with all specifications listed.

27.02 Vendor must acknowledge VENDOR COMPLIANCE. If vendor does not acknowledge VENDOR COMPLIANCE, it will be understood that vendor cannot fulfill said specifications.

If it is necessary to bid alternate materials or to take exceptions to the specifications as set forth, this must be so stated in your bid. For each item, please place an X in the appropriate space (Yes__ No__) to signify whether or not you are in complete compliance with the specification. Failure to follow the format or answer the specification may cause your bid to be disqualified. If you need extra space to describe your product, please attach extra sheets. When doing this, be sure your description references the appropriate question number.

27.03 Compliance with or variations from the specifications must be noted as to each item on the Specification Sheet. This requirement must be met even though the Purchasing Manager may alter the specifications in the form of an addendum to accommodate variances. A request for a change in the specifications to accommodate a variation must be called to the attention of the Purchasing Manager at least 72 hours before the bid opening date. All requests for such changes will be considered and the merits weighed. Only those changes in specifications deemed to be in the best interest of the City will be made. In the event of a change in specifications, an addendum will be supplied to bidders. Exceptions may be accepted if they are minor, equal, or superior to that which is specified, and provided that they are listed and fully explained on a separate page entitled, "Exceptions to Specifications". The exceptions shall refer to the specification page and paragraph number. The City shall determine which (if any) exceptions are acceptable and this determination shall be final.

28.0 QUANTITIES The City of Fairhope does not guarantee The purchase of any set quantities.

CITY OF FAIRHOPE
BID PROPOSAL

BID NO.: 003-10

BID NAME: MATERIALS FOR LIFT STATION KEY ALLEGRO

Delivery lead time ARO: _____ Days

We propose to meet or exceed the above specifications for the sum of:

BID PRICE TOTAL: \$ _____

Each bid must give the full business address of the bidder and must be signed by him with his usual signature. Bids by partnerships must furnish the full names of all partners and must be signed with the partnership name by one of the members of the partnership, or by an authorized representative, followed by the signature and designation of the person signing. Bids by corporations must be signed with the legal name of the corporation followed by the name of the State of Incorporation and by the signature and designation of the president, secretary, or other person authorized to bind it in the matter. The name of each person shall also be typed or printed below the signature. A bid by a person who affixes to this signature the word "president," "secretary," "agent," or other designation without disclosing his principal, may be held to be the bid of the individual signing. When requested by the City of Fairhope, Baldwin County, Alabama, satisfactory evidence of the authority of the officer signing in behalf of the corporation shall be furnished.

The undersigned agrees to furnish the goods/services as requested by you for the City of Fairhope, Baldwin County, Alabama in your invitation to bid, and certifies that they will meet or exceed the specifications called for. The undersigned has read all information pertaining to this bid and has

