



PASCO COUNTY, FLORIDA

"Bringing Opportunities Home"

Dept. Of Environmental Protection
NOV 02 2010
Southwest District

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PASCO COUNTY SOLID WASTE
RESOURCE RECOVERY FACILITY
14230 HAYS ROAD
SPRING HILL, FL 34610

October 26, 2010

Ms. Cindy Mulkey
Engineering Specialist
Florida Department of Environmental Protection
Siting Coordination Office
Mail Station 48
3900 Commonwealth Blvd.
Tallahassee, FL 32399

RE: Pasco County Resource Recovery Facility
Permit No. 1010056-002-AV
Request for Administrative Amendment to Site Certification
Landfill Equipment Shelters

Dear Ms. Mulkey:

In accordance with the provisions of Rule 62-17.205, F.A.C., Pasco County, Florida hereby requests a post certification amendment to the Site Certification for the Pasco County Resource Recovery Facility. The purpose of this amendment request is to obtain after-the-fact approval to construct three canopies that will be used to shelter equipment (fixed and mobile) utilized in landfill operations at the Facility. In addition, we are requesting that your agency update the Conditions of Certification for the Facility to reflect the fact that the diesel pump used to transfer leachate from the holding tank to mobile tankers has been replaced with an electric pump.

Canopies

The attached aerial photos in **Attachment 1** illustrate the location of the canopies that have already been constructed. As stated above, these canopies will be utilized to shelter equipment that is used in landfill operations. While these structures are not integral to the operation of the landfill, the Southwest District has nonetheless instructed Pasco County that FDEP permits must be obtained for them. The large shed in the vicinity of the A-1 landfill cell is approximately 60' by 100' and is constructed of prefabricated metal parts. It will be used to shelter mobile equipment from the elements. The second shed adjacent to the obsolete leachate treatment building is approximately 50' by 50' and is also constructed of prefabricated metal parts. This structure will be utilized to shelter tankers from rainfall

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while loading leachate for transport offsite. The third shed, covering the leachate transfer pump station, is approximately 16' by 10' and is also constructed of prefabricated metals parts.

Leachate Pump

In addition to the structures described above, we are requesting that the Department update the Conditions of Certification to reflect that the leachate transfer pump is no longer diesel-powered, but is now electrically-powered. **Attachment 2** provides the specifications for the new pump. This replacement was undertaken by Pasco County in our continuing effort to reduce emissions from County operations. The functionality of transferring leachate from the storage tank to mobile tankers is unchanged by this modification.

Thank you for your assistance in implementing these minor revisions to the Facility's Conditions of Certification. If additional information is needed to process this request, please do not hesitate to contact me at (727) 856-0119.

Sincerely,



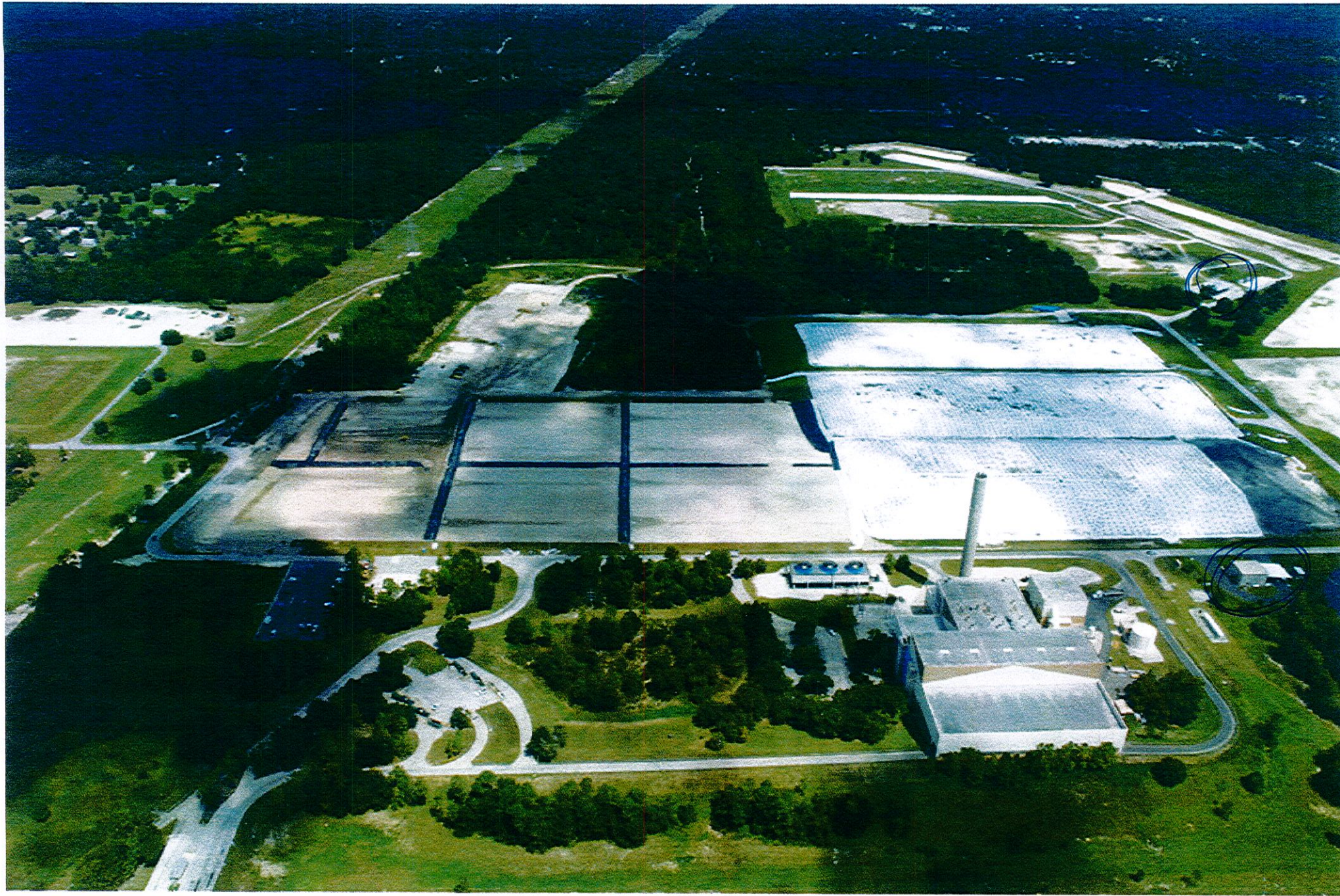
John Power
Solid Waste Facility Manager

JP/gn/admamendsitecertification

Attachments

cc: Ms. Susan Pelz, Florida Department of Environmental Protection, 13051 North Telecom
Parkway, Temple Terrace, Florida 33637-0926
Ms. Melissa Madden, Florida Department of Environmental Protection, 13051 North Telecom
Parkway, Temple Terrace, Florida 33637-0926
Bruce E. Kennedy, P. E., Assistant County Administrator
Joseph Richards, Senior Assistant County Attorney





SECTION 11312

SELF-PRIMING CENTRIFUGAL PUMPS

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required and install, complete and ready for operation and field test, the specified self-priming centrifugal pumps including the respective drives and controls as shown on the Drawings and as specified herein. One pump, drive and base shall be installed as shown in the drawings, one pump drive and base shall be delivered to the OWNER as a spare. Coordinate deliver location with OWNER.

1.02 RELATED WORK

- A. Concrete work and the installation of anchor bolts are included in Division 3, but the anchor bolts shall be furnished under this Section.
- B. Field painting, except as specified herein, is included in Section 09902.
- C. Instrumentation and control work, except as specified herein, is included in Division 13. Instrumentation and controls provided in this section shall adhere to Instrumentation and Control Specifications Sections in Division 13.
- D. Mechanical piping, valves, pipe hangers and supports are included in the respective sections of Division 15.
- E. Electrical work is included in Division 16.

1.03 SUBMITTALS

- A. Submit, in accordance with Section 01300, copies of all materials required to establish compliance with this Section. Submittals shall include the following:
 - 1. Certified shop and installation drawings showing all details of construction, dimensions and anchor bolt locations.
 - 2. Descriptive literature, bulletins and/or catalogs of the equipment.
 - 3. Data on the characteristics and performance of each pump. Data shall include guaranteed performance curves, based on actual shop tests on similar units, which show that they meet the specified requirements for head, capacity, efficiency, NPSHR, slippage with respect to speed and viscosity and brake horsepower. Curves shall be submitted on 8-1/2-in by 11-in sheets, at as large a scale as is practical. Curves shall be plotted specifically for the pump proposed from no flow at shut off head to pump capacity at minimum specified TDH. Catalog sheets showing a family of curves will not be acceptable.
 - 4. Complete master wiring diagrams, elementary or control schematics, including coordination with other electrical control devices operating in conjunction with the drives and suitable outline drawings showing such details as are necessary to locate conduit stubups and field wiring.
 - 5. The weight of individual pieces of equipment as well as the total weight of the pumping unit.
 - 6. A complete bill of materials of all equipment.

7. A list of the manufacturer's recommended spare parts to be supplied in addition to those specified in Paragraph 1.08 below, with the manufacturer's current price for each item. Include gaskets, packing, etc, on the list. List the bearings by the bearing manufacturer's numbers only.
8. Complete motor and drive data.
9. Copies of all test results, as specified in PART 3.
10. Calculations to substantiate 100,000 hours B-10 bearing life expectancy.
11. Descriptive literature on surface preparation and shop priming.

C. Manufacturer's Installation Instructions

1. Services of the equipment manufacturer's factory-trained service engineer shall be provided as required to assist in start-up, calibration, testing and training.
2. Provide one 8-hour day, for operation and maintenance startup, shutdown, troubleshooting, lubrication and safety instructions to the Owner's and Engineer's personnel on the equipment.
3. Provide services of a factory-trained service engineer for two site visits, each covering one 8-hour working day. This service shall be called for by the Owner any time within one year from plant start-up.
4. Times specified above are exclusive of travel time to and from facility and do not relieve the manufacturer from providing sufficient services to place equipment in satisfactory operation.

D. Operation and Maintenance Data

1. Complete operating and maintenance manuals shall be furnished for all equipment as provided in Section 01170. The instructions shall be prepared specifically for this installation and shall include all required cuts, drawings, equipment lists, descriptions that are required to instruct operation and maintenance personnel unfamiliar with such equipment. The maintenance instructions shall include trouble shooting data and full preventative maintenance schedules.

1.04 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM)

1. ASTM A48 - Standard Specification for Gray Iron Castings.
2. ASTM A470 - Standard Specification for Vacuum-Treated Carbon and Alloy Steel Forgings for Turbine Rotors and Shafts.

B. American Gear Manufacturers Association (AGMA)

C. American National Standards Institute (ANSI)

D. American Bearing Manufacturers Association (ABMA)

E. National Electrical Manufacturers Association (NEMA)

F. Hydraulic Institute (HI)

G. American Welding Society (AWS)

H. Occupational Safety and Health Administration (OSHA)

- I. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.05 QUALITY ASSURANCE

- A. To assure unity of responsibility, the Contractor shall ensure that the pumps and drives shall be furnished and coordinated by the pump manufacturer. The Contractor shall assume responsibility for the satisfactory installation and operation of the specified pumping systems.
- B. The equipment specified herein is intended to be standard pumping equipment of proven ability as manufactured by reputable concerns having extensive experience in the production of such equipment. The equipment furnished shall be manufactured and installed in accordance with the best practice and methods and shall operate satisfactorily when installed as shown on the Drawings.
- C. Pumps shall be the products of a single manufacturer. Pumps shall be Model JS4A-E6.2-1 by Gorman Rupp or equal having a minimum of 5 years of same size pump in operation and having a service representative within a 100 mile radius of the site.

1.06 SYSTEM DESCRIPTION

- A. The pump will transfer 6,000 gal of ash cell leachate having a relatively high salt concentration and nearly neutral pH from the leachate storage tank to a tanker trailer within approximately a 15 minute period.

1.07 DELIVERY, STORAGE AND HANDLING

- A. All equipment shall be properly crated to protect any and all components from damage during shipment.
- B. All parts shall be properly protected so that no damage or deterioration will occur during a prolonged delay from the time of shipment until installation is completed and the units and equipment are ready for operation.
- C. All equipment and parts shall be properly protected against any damage during a prolonged period at the site. The motor for each pump shall be supplied with a space heater installed inside the motor enclosure. In order to maintain the temperature of the motors well above the dew point and thus prevent condensation of moisture within the motor enclosure, energize the space heaters as soon as the motors are delivered to the site. These heaters shall remain energized until the motors are electrically connected in place and the heaters are energized by the control circuit.
- D. Factory assembled parts and components shall not be dismantled for shipment unless permission is received in writing from the Engineer.
- E. Finished surfaces of all exposed flanges shall be protected by wooden blank flanges, strongly built and securely bolted thereto.
- F. Finished iron or steel surfaces not painted shall be properly protected to prevent rust and corrosion.
- G. After hydrostatic or other tests, all entrapped water shall be drained prior to shipment and proper care shall be taken to protect parts from the entrance of water during shipment, storage and handling.

H. No shipment shall be made until approved by the Engineer in writing.

I. All equipment delivered to the site shall be stored as specified in Section 01170.

1.08 MAINTENANCE

A. Tools and Spare Parts

1. Furnish all special tools required for the proper servicing of all equipment as specified in Section 01170. All such tools shall be furnished in a suitable steel tool chest complete with lock and duplicate keys.
2. The following spare parts shall be furnished for each pumping unit.
3. One year's supply of lubricants of the type recommended by both the pump and the gear motor manufacturers.
4. All spare parts shall be properly protected for long periods of storage and packed in containers which are clearly identified with indelible markings as to the contents.

PART 2 – PRODUCTS

2.01 SELF-PRIMING CENTRIFUGAL PUMPS

A. Type: Horizontal, self priming centrifugal pumps, motor driven.

B. General

1. This Section is intended to give a general description of what is required, but does not cover all details which will vary in accordance with the requirements of the equipment as offered. It is, however intended to cover all materials, equipment and appurtenances for the complete pumping units as herein specified, whether specifically mentioned in this Section or not.
2. For all units there shall be furnished and installed all necessary and desirable accessory equipment and auxiliaries whether specifically mentioned in this Section or not, and as required for an installation incorporating the highest standards for the type of service.
3. Pump bases shall be rigidly and accurately anchored into position on concrete pads and all necessary foundation bolts, plates, nuts and washers shall be furnished and installed. Anchor bolts shall be Type 304 stainless steel.
4. Brass or stainless steel nameplates giving the name of manufacturer, the rated capacity, head, speed and all other pertinent data shall be attached to each pump.
5. The pumps and drives shall conform to the noise limitations specified in Section 01170.
6. The manufacturer shall supply all motors and factory mount them with the pumps.
7. Each pump and motor shall be designed to withstand the maximum turbine run-away speed of the pump due to backflow through the pump.
8. Pumps and pump bases shall have suitable provisions such that leakage may be collected and drained away.

C. Castings

1. Casings shall be designed for handling the fluids for which they will be used and shall be of cast iron conforming to ASTM A48, Class 30 of sufficient thickness and suitably ribbed to withstand all stresses and strains of service at full operating pressure. A cover plate shall be provided in the volute to provide convenient access to the impeller and interior parts of the pump. The inner contours of the cover plate shall match the contours of the casing which it fits. The casing shall be provided with all necessary vent, drain and gauge connections. Suction and discharge connections shall be 125 lb ANSI standard flanges and shall be

positioned as shown on the Drawings. Stationary guides shall not be permitted on either the suction or discharge side of the casing. Each pump shall be designed to retain adequate liquid in the pump casing to insure unattended automatic repriming. The entire rotating assembly which includes bearings, shaft seal and impeller, shall be removable as a unit without disturbing pump volute or piping. Means shall be provided for external adjustment of the impeller and wear plate.

D. Impeller

1. The impeller shall be 2-vane, semi-open, non-clog, cast in ductile iron, with integral pump-out vanes on the back shroud and shall be threaded to the pump shaft. Impellers shall be of physical and tensile strength requirements of ASTM A48, Class 30. Impeller shall be cast in one piece and shall be statically and dynamically balanced.

E. Shafts: Carbon Steel per ASTM A470.

F. Shaft Sleeve

1. The shaft shall be covered and protected by a stainless steel shaft sleeve which shall be stellite coated and replaceable.

G. Bearings

1. Anti-friction type, B-10 life in excess of 100,000 hours at maximum operating conditions in accordance with ABMA B3.15 and B3.16.
2. Bearings shall be all lubricated with the bearing pedestal cooled by the pumped liquid.

H. Seals

1. The pump shall be sealed against leakage by a balanced mechanical seal. Both the stationary sealing member and the mated rotating member shall be of tungsten-titanium carbide alloy. Each of the mated carbide surfaces must be grounded and polished to produce a flatness tolerance not to exceed 5.8 millionths of an inch as measured by an optical flat and monochromatic light. The stationary seal must be double floating and self-aligning during periods of shock loading. The mechanical seal shall be installed within a separate oil filled reservoir of the pump pedestal the oil serving as both lubricant and cooling media.

I. Suction Check Valve

1. The pumps shall incorporate molded one piece tapered suction check valves.

J. Wear Plate

1. Removable stainless steel wearing plates shall be provided for both the casing and the impeller and shall be designed for easy replacement. The impeller rings shall be 11 to 13 percent chrome. The casing plate shall be 17 to 19 percent chrome, with a 50 point difference in Brinell hardness in the 400 to 450 range.

K. Common Baseplate

1. Pump and drive mounted on common baseplate sufficiently reinforced to resist shock loads that may be encountered during operation. Pump flexibly coupled to motor.

L. Pressure Gauges

1. Pressure gauges shall be bourdon tube Ashcroft Duragauge Series 1279 Black Phenol Turret design 4-1/2-in dial or equal.

2. Pump suction gauges shall be calibrated from 0 to 40-ft of water above atmospheric pressure. Pump discharge gauges shall be calibrated from 0 to 100-ft of water above atmospheric pressure.
3. Gauges shall be provided with 1-in bronze ball valves, Figure No. 900-T by Jenkins Brothers or equal. Valve shall be threaded and suitable for a 400 psi working pressure. Valve ball shall be brass.
4. All pressure gauges shall be furnished with isolating diaphragm seals. Diaphragm seals shall be Teflon coated Type 316 stainless steel suitable for use with the pressure gauges. Diaphragm seals shall have a flushing connection.
5. All gauges and diaphragms shall be furnished by the pump manufacturer.

M. Motor

1. The motor shaft shall be connected to the pump shaft through a spacer type, flexible coupling. Furnish a suitable coupling guard in conformance with OSHA.
2. The motors shall conform to Section 01171.

2.02 CONTROL SYSTEM

- A. The Manufacturer shall provide a complete and fully functional control system to manually or automatically operate the pump system as specified herein and in other applicable sections of these specifications. All Manufacturers recommended safety devices shall be furnished to protect operators. All control devices, unless specified otherwise, shall be mounted in the Control Panel.
- B. Control Panel Construction
 1. The control panel shall consist of a main circuit breaker, a motor circuit protector (MCP) and magnetic starter, and a 120-volt control power transformer (fused on primary and secondary). All control components shall be mounted in one common enclosure. Control switches shall provide means to operate each motor manually or automatically.
 2. Unless specifically noted otherwise, the electrical control equipment shall be mounted within a NEMA 4X enclosure, constructed of not less than 14 gauge 316 stainless steel. Latches shall be quarter turn quick release type and all hardware shall be 316 stainless steel. Where NEMA 3R or 12 enclosures are specifically required, the door shall be provided with a pad-lockable vault type 3-point latch. The enclosure shall be equipped with a door and shall incorporate a removable back panel on which control components shall be mounted. Back panel shall be secured to enclosure with collar studs. Door(s) shall be interlocked with main circuit breaker and provided with pad-locking provision.
 3. All motor branch circuit breakers, motor starters and control relays shall be of highest industrial quality, securely fastened to the removable back panels with screws and lock washers. Back panels shall be tapped to accept all mounting screws. Self-tapping screws shall not be used to mount any component.
 4. A thermal-magnetic air circuit breaker, Type FH as manufactured by the Square D Company, or equal, shall be furnished for the main breaker. All circuit breakers shall be sealed by the manufacturer after calibration to prevent tampering. Each circuit breaker shall be adequately sized to meet the equipment operating conditions. Motor Circuit Protectors (MCP) shall be molded case with adjustable magnetic trip only, "Mag-Gard" as manufactured by the Square D or equal.
 5. An open frame, across-the-line, NEMA-rated magnetic motor/starter, Class 8536 as manufactured by the Square D Company, or equal, shall be furnished for each motor. All motor starters shall be provided with motor circuit protectors and equipped to provide under-voltage release and overload protection on all three phases. Motor starter contacts shall be easily replaceable without removing the motor starter from its mounted position. Overloads

- shall be of the melting alloy or bi-metallic type, adjustable overloads are not acceptable, Class 10 quick trip overloads shall be provided for all submersible motors. Overload reset push-buttons shall be located on the exterior of the door. Normally open and normally closed auxiliary motor overload contacts wired to terminal blocks shall be provided for each motor starter within the control panel.
6. Auxiliary contacts shall be provided for remote run indication and indication of each status and alarm condition. Additional controls shall be provided as specified herein and as required by Divisions 13, 16 and as shown on the drawings.
 7. All operating control and instruments shall be securely mounted on the exterior door. All controls and instruments shall be clearly labeled to indicate function. All exterior mounted equipment shall be NEMA 4X.
 8. Mode selector switches shall be Hand-Off-Auto type to permit override of automatic control and manual actuation of shutdown. Switches shall be NEMA 4X (800H) as manufactured by Allen-Bradley, or equal, providing three (3) switch positions, each of which shall be clearly labeled according to function.
 9. Indicator lamps shall be LED (indoors) or Incandescent (outdoors) full voltage type and mounted in NEMA 4X (800H) modules, as manufactured by Allen-Bradley. Lamp modules shall be equipped to operate at 120 volt input. Lamps shall be easily replaceable from the front of the control compartment door without removing lamp module from its mounted position. Indicators shall be provided for individual motor run and an indicator for each failure condition.
 10. A six (6) digit, non-reset elapsed time meter shall be connected to each motor starter to indicate the total running time of each motor in "hours" and "tenth of hours". The elapsed time meters shall be Series T50 as manufactured by the ENM Company or equal.
 11. A failure alarm with horn and beacon light shall be provided. Silence and reset pushbuttons shall also be furnished. A common failure reset pushbutton shall be provided to reset the alarm conditions (reset shall occur only if fault condition has been cleared). The alarm horn shall be weatherproof rated with gasket (Federal Signal Corporation, Cat. #350 or equal). The alarm beacon shall be NEMA 4X rated, red lense and solid state flasher (Ingam Products Inc. LRX-40).
 12. The control panel shall operate on a power supply of 480 volts, 3-phase, 60 hertz unless otherwise noted.
 13. The control diagrams and overload tables shall be laminated to the inside of the door except where door space is limited the laminated documents shall be in the print storage pocket.
 14. Print storage pockets shall be provided on the inside of each panel. Pocket shall be of sufficient size as required to hold all prints necessary to service the equipment. A set of reduced drawings shall be provided for each panel, fixed to fit in the storage pocket.
 15. A duplex GFCI utility receptacle (circuit breaker protected) providing 120 volts, 60 Hertz, single phase current shall be mounted on the side of the enclosure.
 16. The control panel shall include a manual and automatic mode. In the automatic mode, the pump shall be controlled by a Programmable Logic Controller (PLC).
 17. A phase monitor shall be provided for the control panel, monitors shall be model SUA-440-ASA as manufactured by Diversified Electronics Inc., or equal.
 18. All exterior mounted equipment shall be rated NEMA 4X. Hinged NEMA 4X 316 stainless steel viewing windows will be permitted where such equipment is not available with a NEMA 4X rating.
 19. The control panel shall be provided with lightning and surge protection. The surge protection devices (SPD) shall be mounted within the control panel enclosure. Lead lengths shall not be longer than 12 inches from the main circuit breaker. The SPD shall have minimum surge current capacity rating of 80 kA per phase. The surge protection devices shall be listed in accordance with UL 1449 Second Edition and as defined by IEEE C62.41 and C62.45.

20. All control panel wiring shall be numbered at both ends with type written heat shrinkable wire markers.
21. Wiring shall be stranded copper, minimum size #14 AWG (except for shielded instrumentation cable), with 600 volt, 90 degree C, flame retardant, Type MTW thermoplastic insulation.
22. The control panel shall be provided with nameplates identifying each component, selector switches, pilot lights, etc.. Nameplates shall be permanently affixed using an epoxy process (inner door nameplates shall be fastened with stainless steel screws). Nameplates shall be laminated plastic, engraved white letters with a black background.
23. All control panels shall be provided with a master nameplate located on the exterior door.
24. Where applicable provide a nameplate which reads as follows "CAUTION - THIS PANEL CONTAINS A VOLTAGE FROM AN EXTERNAL SOURCE." Letters shall be black on a high visibility yellow background.
25. Corrosion Inhibitor Emitter: Inclusion of an industrial corrosion inhibitor emitter that shall protect internal components of control panel from corrosion for up to one year. One spare emitter shall be provided for each control panel.
26. All control relays shall have 10 amp rated contacts (minimum), 11 pin with mounting base, 3PDT (minimum), with LED indicators to show relay status, relays shall be manufactured by Potter Brumfield or equal.
27. Terminal blocks shall be 600 volt heavy duty rated, tubular clamp type. Terminal strips shall be Allen Bradley catalog #1492-CA-1 or equal. Each terminal shall be individually labeled.
28. The completed control panel assembly shall be U.L. certified.
29. Intrinsically safe relays shall be solid state type with 5 amp output contacts, suitable for use on 120 volt, 60 hertz power supply and shall be Factory Mutual approved for devices in Class 1, Division 1 hazardous atmospheres. Intrinsically safe relays shall be Gems Solid State Safe-Pak as manufactured by Gems Sensors, Division of Transamerica Delaval, Inc. or equal.
30. All electronic control equipment (i.e. controllers, isolators, signal boosters, transmitters, PLC's, etc) shall be as specified in Division 13.
31. A copper ground bar with sufficient terminals for all field and panel ground connections shall be provided.
32. All signal wiring entering and exiting the control panel shall be provided with surge protection. Surge protection shall be as specified in Division 13.
33. All wiring within the control panel shall be color coded or coded using electrical tape in sizes where colored insulation is not available. The following coding shall be used. For different system voltages, the color coding shall be as required by the Engineer.

C. Control Operation and Logic

1. The control panel shall include a manual and automatic mode. In the automatic mode, the pump shall be controlled by a Programmable Logic Controller (PLC) installed within the panel. The PLC will be used to measure flow volume and operate the pump based on a selectable volume setting. The 'volume' setting shall be selectable and calibrated to measure between 3,000 to 8,000 gallons. The PLC shall measure and totalize the flow signal from a magnetic flow meter signal (4-20mA). Volume selection shall be made through a user accessible keypad with numerical four (4) digit display mounted on the exterior door. Once the desired volume is set, a start/stop button shall be provided to initiate the pump run sequence and the controller shall begin measuring the flow based on the input signal from the flow meter. Once the total preset amount is reached the pump shall stop. If the stop button is pushed before reaching and the pre-set amount, the PLC memory shall remember the amount that has been pumped and allow for continuation of the sequence if/when the pump is restarted. The panel shall include a four (4) digit counter mounted on the exterior door to

- display of the total volume (in gallons) pumped. A counter/pump sequence reset button shall be provided to reset the counter and logic sequence.
2. In the manual/hand mode the pump shall be controlled by a start/stop button to start and stop the pump. The manual mode shall not require any PLC output/input to operate the pump and shall serve as a bypass mode should the PLC fail. Relay logic shall be used to control starting and run function in the manual mode.
 3. The PLC and all devices shall be suited and rated for operation within the interior of the panel. The panel shall be designed to allow proper heat dissipation for all required power supplies, relays, switches and PLC components. All program commands and functions shall be stored in non-volatile memory. The panel shall be suitable for location outdoors and exposed to the sun.

2.03 SURFACE PREPARATION AND SHOP PRIME PAINTING

- A. All surfaces shall be prepared and shop primed as part of the work of this Section. Surface preparation and shop priming shall be as specified in Section 09901.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. The pumps and motors shall be installed in accordance with the instructions of the manufacturers and as shown on the Drawings. In addition, the Contractor shall ensure that the pumps and motors are installed under the supervision of a factory representative of the pump manufacturer.
- B. Base Pads
 1. Pumps and motors shall be installed on the existing concrete pad and shall be securely attached thereto.
 2. The pumps shall be installed on the existing concrete pad located as indicated on the Drawings. The CONTRACTOR shall field verify the location and elevation of the connecting piping and shall coordinate this information with the manufacturers of the proposed equipment.
 3. All anchor bolts for the pumps and drives shall be furnished by the equipment manufacturer.
- C. Installation shall include furnishing the required oil and grease for initial operation. The grades of oil and grease shall be in accordance with the manufacturer's recommendations.
- D. Field tests shall not be conducted until such time that the entire installation is complete and ready for testing.

3.02 FACTORY TESTS

- A. Pumps
 1. Each pump shall be non-witnessed tested in the manufacturer's shop, in accordance with the applicable test code requirements of the Hydraulic Institute and as specified herein. Pumps shall be tested with the actual motors furnished under this Section.
 2. Preliminary testing of the pump and motor shall be done to ensure that all equipment is operating properly prior to testing.
 3. Certified pump performance curves shall be submitted, including head, capacity, brake horsepower and pump efficiency for each pump supplied. Prior to conducting a pump test, notification of such test and a list of test equipment and test procedures shall be forwarded to

the Engineer at least 10 working days before the scheduled test date. All testing required to determine acceptance of individual pumps and drives shall be witnessed by Engineer. All gauges and other test instruments shall be calibrated within 30 days of the scheduled test and certified calibration data shall be provided. All venturi flow meters shall be calibrated within 2 years of the scheduled test and certified calibration data shall be provided. The supplier will seal all instruments used during a scheduled test and immediately forward the instruments to an independent testing laboratory for certified calibration checks. The cost for calibration tests shall be included in the cost of the equipment.

4. A failure of the pump meeting the operating requirements specified for any reason shall be considered an incomplete test. Upon correction of the problem causing failure, the pump shall be retested. The retesting shall be included under this Contract at no additional cost to the Owner.
5. Each pump assembly shall be submitted in the shop to a hydrostatic test. The test pressure shall be not less than 100 psig. Under this test pressure, no parts shall show undue deflection or other defects. Any defects disclosed by this test shall be corrected only by methods accepted by the Engineer.
6. Four certified copies of all factory pump test data shall be furnished to the Engineer.

3.03 FIELD INSPECTION

- A. Furnish the services of factory representatives of the pump manufacturer, who has complete knowledge and experience in the proper installation, startup and operation of the pumping and drive equipment, to inspect the final installation and supervise the field acceptance tests of the equipment.

3.04 FIELD ACCEPTANCE TESTS

- A. After the installation of the pumps and appurtenances, each complete pumping unit shall be subject to field acceptance tests under actual operating conditions.
- B. The field acceptance tests shall be made under the direct supervision of qualified representatives of the pump and motor manufacturers and in the presence of and as directed by the Engineer. Provide, calibrate and install all temporary gauges and meters, shall make necessary tapped holes in the pipes and install all temporary piping and wiring required for the field acceptance tests. Written test procedures shall be submitted to the Engineer for approval 30 days prior to testing.
- C. The field acceptance tests shall determine the characteristics of each pumping unit and in addition shall demonstrate that under all conditions of operation each unit:
 1. Has not been damaged by transportation or installation.
 2. Has been properly installed.
 3. Has no mechanical defects.
 4. Is in proper alignment.
 5. Has been properly connected.
 6. Is free of overheating of any parts.
 7. Is free of objectionable vibration and noise.
 8. Is free of overloading of any parts.
- D. Field acceptance testing shall be conducted after the installation of all equipment has been completed and the equipment operated for a sufficient period to make all desirable corrections and adjustments. Each pumping unit and all associated equipment shall be given a field acceptance test to determine that operation is satisfactory and in compliance with this Section.

- E. During the field acceptance tests, each unit shall be operated for not less than 24 hours at the maximum rated speed and pump capacity, and for not less than 8 hours at minimum speed and pump capacity.
- F. During the field acceptance tests, readings shall be taken at 30 minute intervals and recorded on suitable log sheets. These readings shall include data from pressure gauges, driver output rpm's, wet well liquid levels, power kw and all other information necessary to calculate the actual performance characteristics of the pump, driver, and ancillary equipment. A written report shall be submitted to the Engineer tabulating equipment tested, test results, problems encountered and corrective action to be taken within 2 weeks after test completion.
- G. Field acceptance tests and testing procedures shall be mutually arranged and coordinated with the Owner's plant personnel and representatives. Schedule testing procedures, with the full knowledge and consent of the Engineer, shall not adversely affect the operation of plant facilities.
- H. If any unit fails to fulfill the performance specified herein, corrective measures shall be taken and the units retested to assure full compliance with this Section. A revised written report shall be submitted to the Engineer. All costs associated with the field acceptance tests including those associated with any required corrective action, shall be borne by the Contractor.
- I. A 7 day operating period of stable and vibration-free operation shall be required for each pumping unit prior to final acceptance.

TABLE 11312-1 PUMPING REQUIREMENTS

Minimum Shutoff Head (ft)		33
Motor to be supplied (HP)	5	
Maximum Pump Speed (rpm)		1,800
Design Flow (gpm)		400
TDH at Design Flow (ft)		20
Minimum Runout Flow (gpm)		700
Minimum head allowed at minimum runout flow (ft)	10	

END OF SECTION

Pump Data Sheet - Gorman-Rupp



Company: West Pasco

Name:

Date: 10/26/2010

Pump:

Size: T4A-B-4

Type: T-SERIES
Synch speed: Adjustable

Curve: T4A-B-4

Specific Speeds:

Dimensions:

Speed: 1300 rpm
Dia: 9.764 in

Impeller:

Ns: ---
Nss: ---

Suction: 4 in
Discharge: 4 in

Search Criteria:

Flow: 400 US gpm

Head: 41 ft

Fluid:

Water
Density: 62.25 lb/ft³
Viscosity: 1.105 cP
NPSHa: ---

Temperature: 60 °F
Vapor pressure: 0.2563 psi a
Atm pressure: 14.7 psi a

Motor:

Standard: NEMA
Enclosure: TEFC
Sizing criteria: Max Power on Design Curve

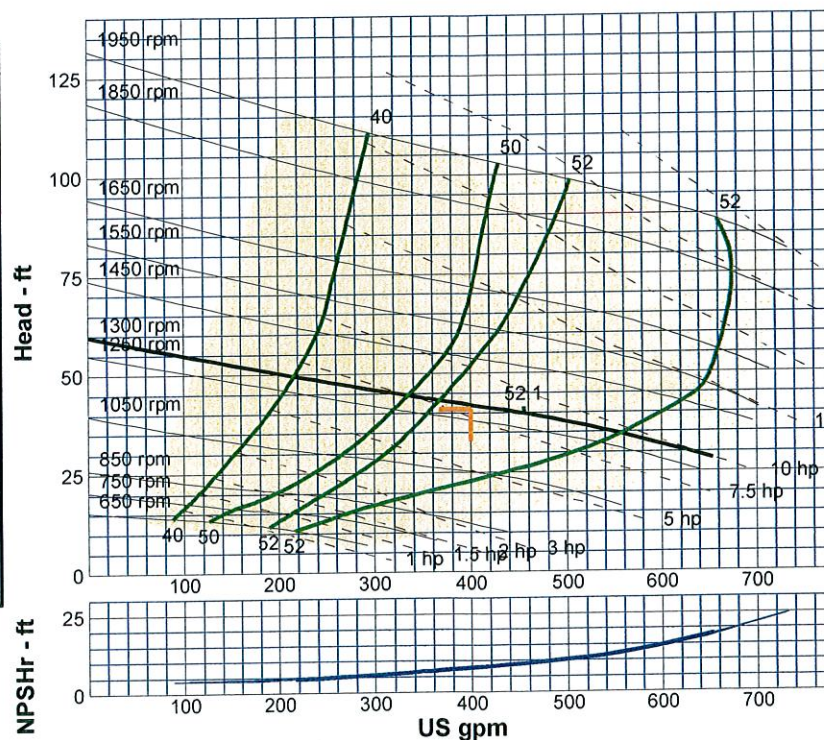
Pump Limits:

Temperature: ---
Pressure: ---
Sphere size: 3 in

Power: ---
Eye area: ---

Speed: ---
Frame: ---

---- Data Point ----	
Flow:	403.1 US gpm
Head:	41.8 ft
Eff:	52%
Power:	8.14 hp
NPSHr:	7.99 ft
---- Design Curve ----	
Shutoff head:	59.7 ft
Shutoff dP:	25.8 psi
Min flow:	---
BEP:	52% @ 455 US gpm
NOL power:	9.97 hp @ 653 US gpm
-- Max Curve --	
Max power:	29.8 hp @ 733 US gpm



Performance Evaluation:

Flow US gpm	Speed rpm	Head ft	Efficiency %	Power hp	NPSHr ft
480	1300	38.5	52	8.92	10
400	1300	42	52	8.11	7.91
320	1300	45.1	49	7.42	6.23
240	1300	48.6	42	6.9	4.96
160	1300	52.2	35	6.38	3.69