

**PART 1 - GENERAL**

**1.1 PROJECT SCOPE**

- 1.1.1 Requirements for providing a *six inch diesel skid mounted pump*.
- 1.1.2 The pump shall be delivered to the owner within 8 weeks of contract commencement or as stated in the notice to proceed.

**1.2 GENERAL**

- 1.2.1 The specifications herein state the minimum requirements of the *Pemberton Township Municipal Utilities Authority*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The *Pemberton Township Municipal Utilities Authority* may consider as “irregular” or “non-responsive”, any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *Pemberton Township Municipal Utilities Authority* to make a reasonable determination of compliance to the specification. It shall be the bidder’s responsibility to carefully examine each item of the specification. Failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected, without review, as “non-responsive”. All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.
- 1.2.2 EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the specified *one 2019 Godwin Dri-Prime<sup>®</sup> CD150M six-inch (6”) by six-inch (6”) pump*, as interpreted by the *Pemberton Township Municipal Authority*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence but will require an explanation at each deviation or substitution.
- 1.2.3 INTERPRETATIONS: In order to be fair to all bidders no oral interpretations will be given to any bidder as to the meaning of the specification’s documents or any part thereof. Every request for consideration shall be made in writing to the *Pemberton Township Municipal Utilities Authority*. Based on written inquiry the *Pemberton Township Municipal Utilities Authority* may choose to issue an Addendum in accordance with Local Public Contract Laws.
- 1.2.4 GENERAL SPECIFICATIONS: Units described shall be new, unused and of the current year’s production. The style of pump being bid must be in production for a minimum of 5 years (include users list). Unit shall be of the latest design and in current production, completely serviced, ready for work and shall include all standard and optional equipment as specified herein. All bidders must have the ability to demonstrate the unit they are bidding prior to bid date.

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- 1.2.5 Bidders must have a fully stocked parts and service facility within 100 miles of the *Pemberton Township Municipal Utilities Authority*. The *Pemberton Township Municipal Utilities Authority* shall have the right to inspect the office and shall be the sole judge of its adequacy to fulfill this requirement.
- 1.2.6 Bidders, at the request of the *Pemberton Township Municipal Utilities Authority*, must be prepared to review their specifications with the *Pemberton Township Municipal Utilities Authority* and if requested must also be prepared to provide a trial unit for the convenience of the *Pemberton Township Municipal Utilities Authority*. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *Pemberton Township Municipal Utilities Authority*.

**1.3 SYSTEM DESCRIPTION**

- 1.3.1 The standby pump specified in this section will be used to *pump raw sewage*
- 1.3.2 The pump and accessories shall be supplied by the pump manufacturer.
- 1.3.3 The pump priming system shall be capable of generating 25 in Hg (28 feet) of vacuum at sea level. It shall also be capable of operation using extended suction lines.

**1.4 DESIGN REQUIREMENTS**

OPERATING SPEED (MAXIMUM) RPM	2000
MAXIMUM SOLIDS HANDLING SIZE	3 INCHES
IMPELLER DIAMETER	11.0 INCHES
SUCTION SIZE	6 INCHES
DISCHARGE SIZE	6 INCHES
MAXIMUM SUCTION LIFT	28 FEET
MAXIMUM DUTY POINT TDH	X GPM AT X FT (INCLUDING A 15 FT DYNAMIC SUCTION LIFT)
SECOND DUTY POINT TDH	X GPM AT X FT (INCLUDING A 15 FT DYNAMIC SUCTION LIFT)

**1.5 REFERENCES**

1.5.1 ANSI (B16.5) - Standard for Cast Iron Pipe Flanges and Flanged Fittings.

**2 PART TWO - PRODUCTS**

**2.1 ACCEPTABLE MANUFACTURERS**

2.1.1 The pump shall be a Model CD150M, size 6" x 6" as manufactured by GODWIN PUMPS, Bridgeport, New Jersey, or Equal.

**2.2 EQUIPMENT**

2.2.1 CASING, SUCTION COVER: Pump castings shall be cast iron. Pump design shall incorporate a direct suction flow path that is in axial alignment with the impeller eye. There shall be no turns, chambers, or valves between the suction flange and the impeller eye.

2.2.2 IMPELLERS: The pump impeller shall be an open, three-bladed, non-clog type with pump-out vanes on the back shroud and fabricated of hardened cast- chromium steel construction (minimum Brinell Hardness 200 HB).

2.2.3 WEARPLATES: Shall be fully adjustable and replaceable, fabricated of cast iron. Wear plate clearances shall have no relationship to the ability of the pump to achieve a prime.

2.2.4 BEARINGS AND SHAFTS: Pump shall be fitted with a bearing bracket to contain the shaft and bearings. Bearings shall be roller bearings of adequate size to withstand imposed loads for sustained pumping at maximum duty points. Minimum ISO L<sub>10</sub> bearing life to be 100,000 hours. Impeller shafts shall be fabricated of 1.5% chromium alloy.

2.2.5 SEALS: Seals shall be high pressure, mechanical, self-adjusting type with silicon carbide faces capable of withstanding suction pressures to 58 psi. The mechanical seal shall be cooled and lubricated in a liquid bath reservoir, requiring no maintenance or adjustment. Pump shall be capable of running dry, with no damage, for periods up to 24 hours. All metal parts shall be of stainless steel. Elastomers shall be Viton.

2.2.6 PUMP SUCTION AND DISCHARGE FLANGES: Shall be cast iron ANSI (B16.5) Class 150, flat faced.

2.2.7 PUMP GASKETS: Shall be compressed fiber and/or Teflon.

2.2.8 PUMP O-RINGS: Shall be Buna-N.

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- 2.2.9 PRIMING SYSTEM: Pump shall be fitted with a fully automatic priming system incorporating an air compressor and air ejector assembly. No vacuum pumps will be accepted. The self-lubricated, self-cooled compressor shall be mounted on the pump bearing bracket and belt driven by the pump shaft. The priming system shall require no fail-safe protection float gear or any adjusting at high or low suction lifts. Pumps with self-priming chambers modified with vacuum priming systems shall not be accepted as equal. The pump must be capable of running totally dry for periods up to 24 hours, then re-priming and returning to normal pumping volumes. Pump and priming system is capable of priming the pump from a completely dry pump casing. Equipment acceptance shall be contingent upon the pump's ability to run continuously at full speed in a completely dry condition. The engineer may require a demonstration.
- 2.2.10 CHECK VALVE: Pump shall be supplied with a ball-type check valve mounted on the discharge of the pump, allowing unrestricted flow from the impeller. The check valve shall prevent in-line return of flow when the pump is shut off. Non-return valve elastomers shall be Nitrile rubber and shall be field replaceable.
- 2.2.11 DRIVE UNIT: The drive unit shall be a diesel, water-cooled engine. The engine shall drive the pump by use of direct-connected intermediate drive plate. Starter shall be 12 VDC electric. A Godwin PrimeGuard 2 control panel consisting of a low oil pressure safety shutdown, high temperature shutdown, tachometer, and hour-meter shall be integrated into the engine control panel. Unit shall include a tachometer and an hour meter. Battery shall have 180 amp hour rating. Drive unit shall be an Isuzu 4LE2X Final Tier 4 or equal, rated at 62 HP (continuous) at 2400 R.P.M. A certified, continuous-duty engine curve shall be supplied to the owner/engineer. Engines not meeting current EPA emissions standards for off road diesel engines shall not be accepted as equal.
- 2.2.12 GOVERNOR: Governor shall be electronic type via the engine control module (ECM). Engine speed shall be adjustable to operate the pump between maximum and minimum design operation speeds.
- 2.2.13 FUEL SOURCE: Integral skid fuel tank capacity shall be sufficient to provide at least 24 hours of operating time at full load. The engines shall be capable of operating satisfactorily on commercial grade of distilled No. 2 fuel oil.
- 2.2.14 EXHAUST: Engine shall include a muffler of suitable size.
- 2.2.15 SOUND ATTENUATED ENCLOSURE: The engine and pump shall be completely enclosed inside an acoustical enclosure to reduce pump and engine noise to 69 dBA or less at a distance of 30 feet. The enclosure will be fourteen and sixteen-gauge sheet metal panels backed with one inch and two-inch layers of polydamp acoustical sound-deadening material. The enclosure shall be removable for easy access to the engine / pump for maintenance and repair. The enclosure doors shall all be equipped with latches that are keyed alike. For maintenance and service needs, the enclosure sides shall have hinged

doors for quick access to the engine oil fill, fuel fill port, oil dipstick, and filters

- 2.2.16 **TRAILER:** The pump, and engine shall be trailer mounted with a pintle type trailer hitch. Tires and suspension shall be adequately sized for the required load range ratings. Trailers shall be equipped with, front and rear support stands, lifting bar, safety chains, and side and rear reflectors. Trailer design shall be in compliance with applicable D.O.T. regulations.
- 2.2.17 **SKID BASE:** The pump and engine shall be skid mounted to a structural steel double wall skid base with an 80 gallon fuel tank. The tank shall including an integral containment berm size for 110% of capacity of the fuel tank. The fuel tank shall be equipped with two (2) sets of drain plugs front and rear providing access to the double wall tank and integral fuel tank. The base tank shall include fork pockets and weld nuts for anchoring to concrete with optional mounting brackets. The skid base shall be designed to install optional trailer or sound attenuated enclosure components. When installed, trailer components shall meet US DOT safety standard for road going trailers.
- 2.2.18 **FACTORY PAINTING:** Pump, engine, and base shall be shop primed and finish painted at the place of manufacturer. Materials and dry film thickness for priming and finish paint shall be in accordance with customer specifications.

### **2.3 AUTOMATIC STARTING CONTROL SYSTEM**

- 2.3.1 The engine shall be equipped with a factory installed PrimeGuard 2 microprocessor-based controller as supplied by Godwin Pumps of America, Inc. and designed to start/stop the engine at a signal supplied by high and low level floats or a 4-20 mA transducer.

#### **2.3.2 ENGINE/PUMP CONTROL SPECIFICATION**

The engine shall be started, stopped, and controlled by a PrimeGuard 2 high performance, state of the art digital controller as supplied by Godwin Pumps. The PrimeGuard 2 Controller shall be weather proof enclosed, and contain an external weatherproof, 12-position keypad accessible without the need to remove or open any protective cover or enclosure. It shall be designed to start/stop the engine at a signal supplied by high and low level floats or a 4-20 mA transducer. The PrimeGuard 2 Control Panel shall provide the following functions without modification, factory recalibration or change of chips or boards by simply accessing the keypad.

- 2.3.2.1 The keypad shall be a capacitive touch-sensing system. No mechanical switches will be acceptable. The keypad shall operate in extreme temperatures, through ice, snow, mud, grease, etc. and maintain complete weather tight sealing.

- 2.3.2.2 During periods of inactivity the unit shall conserve energy and go to “sleep” (115mA parasitic battery draw).
- 2.3.2.3 The PrimeGuard 2 Controller shall function interchangeably from float switches, pressure switch, or transducer, as well as manual start/stop by selection at the keypad. No other equipment or hardware changes are required.
- 2.3.2.4 The PrimeGuard 2 Controller shall be capable of varying the engine speed to maintain a constant level in a process without a change to the panel other than via the keypad.
- 2.3.2.5 The PrimeGuard 2 Controller can be programmed to start and stop the pumpset up to three times daily or three times a week (i.e. a start, exercise cycle on three separate times for a varying length of time via the keypad).
- 2.3.2.6 Manual-Automatic Button
  - 2.3.2.6.1 In Manual Mode, the “Start” button starts engine and runs until “Stop” is pressed or an emergency shutdown occurs.
  - 2.3.2.6.2 In Automatic Mode, start/stop sequencing is initiated by either one (1) high-level N/O and one (1) low-level N/C narrow angle float switches, a 4-20mA transducer, a signal from a digital input, or a single analog 4-20mA speed reference. As a backup, the controller shall also have the option to operate off a transducer with one (1) high-level N/O narrow angle float switch.
- 2.3.2.7 The Controller shall integrate the engine safety shut-off for low-oil temperature and high-temperature, and provide over-speed protection.
- 2.3.2.8 The Controller shall include standard, field adjustable parameters for engine cycle crank timer, shutdown time delay, warm-up time delay, and cool-down time delay.
- 2.3.2.9 The Controller shall have two circuit boards, one for the control board and one capacitive touch keypad board. The capacitive keypad circuit boards has eight (8) available relays that can be programmable to output desired parameter on the display and to be used as dry-contacts for communication with City/Municipality SCADA systems. All via the keypad without changing relays, chips, printed circuits, or any hardware or software.
- 2.3.2.10 Standard components shall consist of (6) digital inputs, (8) analog inputs, (1) magnetic pick-up input, (6) 10-amp form “C” relays, (2) 20-amp form “C” relays, (1) RS485 port, (1) J1939 port, and (1) 320x240 pixel QVGA full graphic LCD display with backlight, (1) 12 position keypad, LED lamps for visual indication of shutdown (red), warning (amber) and power (green).

- 2.3.2.11 The industrially hardened PrimeGuard 2 Controller shall withstand vibration of 3g, 3 axis, frequency swept 10-1000 Hz, in an operating temperature Range of 4° to 176°F (-20° to 80°C) and an operating humidity range of 0-95% Non-Condensing.

## **2.4 OPTIONS**

- 2.4.1 **FULLY AUTOMATIC TRICKLE CHARGER:** The unit shall include a fully automatic trickle charger powered by 6-amps, 115 VAC.
- 2.4.2 **ENGINE BLOCK/ COOLANT HEATER:** The drive unit shall be supplied with an integral 1000-Watt engine block heater. Heater to be supplied with three wire plug, 110 VAC required.
- 2.4.3 **FLOAT SWITCHES:** The PrimeGuard 2 Controller shall be supplied with one-normally open and one-normally closed narrow angler (10° to 20°) float switches. The floats shall be constructed with tilt sensation mercury switches enclosed within stainless steel. Each float will have a minimum 25 ft. waterproof cable wired into a twist-lock wiring harness that connects directly to the PrimeGuard 2 Controller.
- 2.4.4 **LEVEL TRANSDUCER:** The unit shall be supplied with one (1) sewage compatible level transducer assembly including a single 4-20 mA level transducer (0-10 psig), which shall integrate with the engine control panel via a single multi-pin plug.
- 2.4.5 **WORK LIGHTS:** The unit shall be supplied with two (2) adjustable position 12VDC work lights operated by a single switch; integrated into the engine control panel. Control shall be via a mechanical timer switch.
- 2.4.6 **DOT LIGHT:** The trailer shall include a DOT approved lighting package.

## **3 PART THREE - EXECUTION**

### **3.1 MANUFACTURERS SERVICES**

- 3.1.1 The manufacturer shall furnish the services of a competent factory representative to do the following:
- 3.1.1.1 Inspect the system prior to delivery, supervise the start up and testing of the system, and certify the system has been properly furnished and is ready for operation.
- 3.1.1.2 Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

**3.2 TOOLS AND SPARE PARTS**

3.2.1 The manufacturer shall furnish the following on or prior to delivery of the pump.

3.2.1.1 A recommended list of spare parts.

3.2.1.2 An Operations and Maintenance manual for the pump and engine.

**MISCELLANEOUS HOSES AND FITTINGS NEEDED**

- 3 each, 6" x 10' Light weight helix hose with Godwin QD Fittings, or Equal.
- 1 each, 6" One piece suction screen with male Godwin QD fittings, or Equal
- 1 each, 6" Godwin QD Step Bow, or Equal
- 14 each, 6" x 50' Heavy Duty Orange layflat hose with Godwin QD fittings, or Equal
- 5 each, 6" x 10" Godwin QD pipe, or Equal
- 3 each, 6" Godwin QD pipe with female NPT drain, or Equal
- 1 each, 4" male NPT x 2" female NPT adapter, or Equal
- 1 each, 2" Close Nipple
- 1 each, 2" Ball Valve
- 1 each, 2" female cam & groove x 2" male NPT adapter
- 2 each, 2" combination air valve ARI D-025-2, or Equal
- 3 each, 6" x 3" Godwin QD pipe, or Equal
- 3 each, 6" 90 degree Godwin QD bend, or Equal
- 1 each, 6" 45 degree Godwin bend, or Equal

**3.4 WARRANTY**

3.4.1 The manufacturer shall furnish the following to the owner:

3.4.1.1 A copy of the engine manufacturer's parts and labor warranty.

3.4.1.2 A one year Parts and Labor Warranty issued by the manufacturer on the pumpset. This warranty must cover all pump parts, including the mechanical seal.