

**CITY OF MEXICO BEACH
LIFT STATION DIESEL BYPASS PUMP INSTALLATION**

PROJECT # 50112881

SECTION 00000 – JOHN DEERE SPECS

PART 1 – GENERAL

1.1 PROJECT SCOPE

1.1.1 Requirements for providing a 6-inch diesel sound attenuated pump.

1.2 GENERAL

1.2.1 The specifications herein state the minimum requirements of the City of Mexico Beach (CITY). All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY 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 CITY 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 three (3) Godwin Dri-Prime® CD150S six-inch (6”) by six-inch (6”) sound attenuated pump, as interpreted by the CITY for LS 9, 11 and 13. 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 specifications documents or any part thereof. Every request for consideration shall be made in writing to the CITY. Based on written inquiry the CITY 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 10 years (include user’s 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.

- 1.2.5 Bidders must have a fully stocked parts and service facility within 100 miles of the CITY. The pump supplier shall be an authorized warranty center for the Pump and Diesel Engine manufacturer. The pump supplier shall have to be on call 24 hours a day 7 days a week regardless of a holiday. The CITY 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 CITY, must be prepared to review their specifications with the CITY and if requested must also be prepared to provide a trial unit for the convenience of the CITY. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the CITY.

1.3 DESIGN REQUIREMENTS

- 1.3.1 The pump specified in this section will be used to pump raw unscreened sewage at LS 9, 11 and 13.
- 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.
- 1.3.4 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.

1.4 DESIGN REQUIREMENTS

OPERATING SPEED (MAXIMUM)	2200 RPM
MAXIMUM SOLIDS HANDLING SIZE	3.0 INCHES
IMPELLER DIAMETER	11.2 INCHES
SUCTION SIZE	6 INCHES
DISCHARGE SIZE	6 INCHES
MAXIMUM SUCTION LIFT	28 FEET
MAXIMUM DUTY POINT	X GPM AT X FT TDH (INCLUDING A 15 FT DYNAMIC SUCTION LIFT)
SECOND DUTY POINT	X GPM AT X FT TDH (INCLUDING A 25 FT DYNAMIC SUCTION LIFT)

1.5 REFERENCES

- 1.5.1 ANSI (16.5) - Standard for Cast Iron Pipe Flanges and Flanged Fittings.

PART 2 – PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- 2.1.1 The pump shall be a Model CD150S, size 6" x 6" as manufactured by GODWIN PUMPS, Bridgeport, New Jersey, or CITY approved equal.

2.2 EQUIPMENT

- 2.2.1 PRIMING SYSTEM: Pump shall be fitted with a fully automatic priming system incorporating an air compressor and air ejector assembly. The compressor shall be mounted as an integral part of the pump rotating assembly and be driven via a HTD cog belt off of the pump shaft. It shall be lubricated via the diesel engine oil pump. The compressor belt shall be tensioned via an adjustable belt tensioner. The belt shall be removable without separating the engine flywheel (bell housing) from the pump. The priming system shall require no fail-safe protection float gear or any adjusting at high or low suction lifts. 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.
- 2.2.2 CASING, SUCTION COVER, AND SEPARATION TANK: 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.
- 2.2.3 IMPELLER: The pump impeller shall be a two-bladed type fabricated from hardened cast steel (minimum Brinell Hardness 200 HB). The impellers and shaft fixing shall be splined.
- 2.2.4 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.
- 2.2.5 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 L₁₀ bearing life to be 100,000 hours. The installation of the pump shaft and bearings shall not require shims or adjustment. The splined impeller shaft shall be fabricated of carbon steel.
- 2.2.6 SEALS: Seals shall be high pressure, mechanical, self-adjusting type with silicon carbide faces capable of withstanding suction pressures up to 58 psi. The mechanical seal shall be cooled and lubricated in a liquid bath reservoir, requiring no maintenance or adjustment. The lip-seal shall ride on the mechanical seal sleeve and make no contact with the pump shaft. 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.

- 2.2.7 PUMP SUCTION AND DISCHARGE FLANGES: Shall be cast iron ANSI (16.5) Class 150, flat faced.
- 2.2.8 PUMP GASKETS: Shall be compressed fiber and/or Teflon.
- 2.2.9 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.
- 2.2.10 DRIVE UNIT: The drive unit shall be a diesel, water-cooled engine. The engine shall drive the pump by use of a direct-connected intermediate drive plate. Starter shall be 12VDC. 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 a John Deere 4045TF290 rated at 74 HP. A certified continuous duty engine curve shall be supplied to the owner/engineer. The engine shall be rated for Emergency Standby Use only. Engines not certified for emergency operation will not be considered.
- 2.2.11 GOVERNOR: Governor shall be a mechanical type. Engine speed shall be adjustable to operate the pump between maximum and minimum design operation speeds.
- 2.2.12 FUEL SOURCE: Integral skid fuel tank capacity shall be sufficient to provide at least 22 hours of operating time at full load.
- 2.2.13 EXHAUST: Engine shall include a muffler of suitable size.
- 2.2.14 SOUND ATTENUATED ENCLOSURE: The engine and pump shall be completely enclosed with fourteen and sixteen-gauge sheet metal panels backed with one inch and two-inch layers of polydamp acoustical sound-deadening material. The acoustical enclosure shall reduce pump and engine noise to 69 dBA or less at a distance of 30 feet. 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
- 2.2.15 FACTORY PAINTING: Unit 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 manufacturer's standards.

2.3 ENGINE CONTROL SPECIFICATION

- 2.3.1 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 Controller shall be weatherproof 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.

- 2.3.1.1 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
- 2.3.1.2 During periods of inactivity the unit shall conserve energy and go to “sleep” (115mA parasitic battery draw).
- 2.3.1.3 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.
- 2.3.1.4 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.
- 2.3.1.5 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 all via the keypad).
- 2.3.1.6 Manual-Automatic Button
 - 2.3.1.6.1 In Manual Mode, the “Start” button starts the engine and runs until “Stop” is pressed or an emergency shutdown occurs.
 - 2.3.1.6.2 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.
 - 2.3.1.6.3 The Controller shall integrate the engine safety shut-off for low-oil temperature and high-temperature, and provide over-speed protection.
 - 2.3.1.6.4 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.
 - 2.3.1.6.5 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 key play without changing relays, chips, printed circuits, or any hardware or software.

2.3.1.6.6 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) 3.8in 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).

2.3.1.6.7 The industrially-hardened PrimeGuard 2 Controller shall withstand vibration of 3g, 3 axis, frequency swept 5-2000 Hz, in an operating temperature range of -40° to 185°F (-40° to 85°C) and an operating humidity range of 0-70% non-condensing at 85°C.

2.3.1.6.8 AUTO-THROTTLE: The engine shall be fitted with an auto-throttle and integrated into the PrimeGuard control panel for variable engine speed control.

2.3.2 FIELD SMART TECHNOLOGY: The unit shall be equipped with Field Smart Technology (FST) integrated with the PrimeGuard 2 controller. Field Smart shall allow remote communication with the pumpset via password protected cloud-based webserver. FST shall have the ability to communicate anywhere in the world and offer 3 modes of communication—GPS, Cellular, Satellite. FST shall allow the unit to be started, stopped, and vary the speed from the web hosted platform and transmit the following data at a minimum:

- Timestamp
- Engine hours
- Engine on/off
- Engine Temp
- Battery Voltage
- RPM
- Oil Pressure
- Optional voice alarm notifications

FST shall read data from the PrimeGuard 2 and, on electronic engines, directly from the ECU. All Data shall be recorded in one minute intervals and available for download. The web hosted platform shall enable users to set alarms for engine on, engine off, geofence barriers and ECU alarms.

2.3.3 ELECTRONIC FUEL SENDER: The unit shall be supplied with (1) custom length fuel sensor assembly. Fuel sensor will have a 1½in NPT brass pipe plug and a sensor output of 33-240ohms. The sensor shall integrate with the engine control panel via the analog inputs on the PrimeGuard2.

2.4 WATER LEVEL DEVICES

2.4.1 FLOAT SWITCHES: One-normally open and one-normally closed narrow angle (10° to 20°) float switches integrate into automatic pump controller. The floats shall be constructed with tilt sensation 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 a PrimeGaurd 2.

- 2.4.2 LEVEL TRANSDUCER: The unit shall be supplied with (1) one 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.
- 2.4.3 ENGINE BLOCK 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.
- 2.4.4 FULLY AUTOMATIC TRICKLE CHARGER: The unit shall include a fully automatic trickle charger powered by 6-amps, 115 VAC.
- 2.4.5 INTERIOR LIGHT: The unit shall include a single switch operated 12 VDC interior dome light mounted within the enclosure.
- 2.4.6 WORKING LIGHT: The unit/s shall include two (2) externally base mounted, adjustable, 12 VDC flood light/s, rearward facing the suction and discharge piping operated by a single switch.
- 2.4.7 PUMP RUNNING STROBE LIGHT: The unit shall include a 12 VDC Yellow strobe light mounted on the enclosure to operate while the engine is running.
- 2.4.8 PUMP OFF STROBE LIGHT: The unit shall include a 12 VDC Red strobe light mounted on the enclosure to operate while the engine is off.
- 2.4.9 DC / AC INVERTOR: The unit shall include one (1) 12 VDC to 110 VAC volt single-phase inverter, 1750 watts, mounted inside enclosure, single 15-amp GFI outlet, one (1) fusible link.

PART 3 – 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.

3.3 WARRANTY

3.3.1 The manufacturer shall furnish the following to the owner:

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

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