INVITATION FOR BIDS

FOR THE PURCHASE OF A GORMAN-RUPP 4" SELF-PRIMING SEWAGE PUMP AND TRAILER

RESPONSE DUE: 5:00 p.m. on August 15, 2022

Town of Windsor
Public Works Department
8400 Old Redwood Highway
Windsor, CA 95492

Contact:
David Ernst
Wastewater Superintendent, Project Manager
dernst@townofwindsor.com
707-838-5328

Approved for Release:

7/19/2022

Shannon Cotulla, Public Works Director/Town Engineer Date

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INVITATION FOR BIDS FOR THE PURCHASE OF A GORMAN-RUPP 4" SELF-PRIMING SEWAGE PUMP AND TRAILER FOR THE TOWN OF WINDSOR

Section 1 - INTRODUCTION

The Town of Windsor Public Works Department is issuing an Invitation for Bids (IFB) to facilitate the purchase of a 4" pump . The required 4" pump specifications and options are specifically outlined herein and in the attached Appendices.

The Town intends to award the purchase of a Model Year 2022 GORMAN-RUPP 4" SELF-PRIMING SEWAGE PUMP AND TRAILER or equivalent, based on evaluation and selection criteria of each vendor's qualifications and bid. This 4" pump will be used by the Town of Windsor Public Works maintenance staff to service municipal water distribution and sewer collection systems. All equipment shall be new and unused and delivered with the manufacturer's standard warranty.

The Town requires the following list of minimum vendor qualifications:

1. Bidder shall be regularly and continuously engaged in the business of providing commercial 4" pump sales for at least five (5) years.

2. Bidder shall be a factory authorized dealer of commercial 4" pumps.

3. Bidder shall possess all permits, licenses and professional credentials necessary to supply product and perform services as specified under this Invitation for Bids (IFB).

The Town of Windsor's Purchasing Policies and Procedures are established under Section 1 of Chapter 6 in Title 1 of the Town of Windsor Code. Competition in purchasing provides equal opportunity for qualified vendors to compete for local business to offer the best prices, quality, or service.

The Town of Windsor (Town) has prepared this Invitation for Bids. The following six (6) firms are receiving this IFB and the IFB has been posted on the Town's website:

- Aaction Rents, Windsor
- United Rentals, Santa Rosa
- Peterson Caterpillar, Santa Rosa
- Cresco Equipment, Livermore
- Herc Rentals Inc., Santa Rosa
- Pape Machinery, Rohnert Park

Section 2 – BACKGROUND

Windsor is located in central Sonoma County, approximately 20 miles east of the Pacific Ocean. The City of Healdsburg is approximately five miles to the northwest and Santa Rosa, the Sonoma County seat, lies seven miles to the southeast. The Town of Windsor encompasses 7.3 square miles (4,672 acres). Future growth and land use changes for the Town of Windsor are limited to the Urban Growth Boundary (UGB). The Windsor UGB currently encompasses 7.5 square miles and includes the incorporated areas of the Town as well as surrounding unincorporated areas that may be affected by the future growth of the Town.
The Town, together with the Windsor Water District, owns and operates:

- a potable water production, storage and distribution system,
- a wastewater collection system and reclamation facility, and
- a recycled water storage and distribution system.

These utility systems require ongoing maintenance, service, and repair and the Town provides the necessary staffing and equipment to provide a highly effective professional maintenance division.

Section 3 – FORMAT AND CONTENTS OF BID DOCUMENTS

To maintain uniformity in the bid evaluation process, your Invitation for Bid (IFB) shall be limited to a maximum of fifteen (15) pages **including all attachments**. Paper size shall be limited to 8 ½-inch by 11-inch size in the proposals except for figures and tables for which 11 inches by 17 inches may be used. The text font shall not be smaller than size 11 except within any tables included. The bid shall include the following sections in the order below:

- **BIDDER INFORMATION - ACCEPTANCE FORM – APPENDIX A**
- **WINDSOR BID SCHEDULE FORM – APPENDIX B**
- **MINIMUM 4" PUMP AND EQUIPMENT SPECS – APPENDIX C**

Quoted Price Must Include:

A. All pricing as quoted will remain firm for the term of any contract or purchase order that may be awarded because of this IFB.

B. Unless otherwise stated, Bidder agrees that, in the event of a price decline, the benefit of such lower price shall be extended to the Town.

C. All prices are to be F.O.B. destination. Any freight/delivery charges are to be included.

D. Taxes and freight charges:

1. The prices quoted shall be the total cost the Town will pay for this contract including sales, use, or other taxes, and all other charges.

2. No charge for delivery, drayage, express, parcel post packing, cartage, insurance, license fees, permits, costs of bonds, or for any other purpose, except taxes legally payable by Town, will be paid by the Town unless expressly included and itemized in the bid.

E. All prices quoted shall be in United States dollars and "whole cent," no cent fractions shall be used. There are no exceptions.

F. Price bids shall include any and all payment incentives available to the Town.

G. Bidders are advised that in the evaluation of cost, if applicable, it will be assumed that the unit price quoted is correct in the case of a discrepancy between the unit price and an extension.

H. Federal and State minimum wage laws apply. The Town has no requirements for living wages. The Town is not imposing any additional requirements regarding wages.

I. Prevailing Wages: Pursuant to Labor Code Sections 1770 et seq., vendor shall pay to persons performing labor in and about Work provided for in Contract not less than the general prevailing rate of per diem wages for work of a similar character in the locality in which the Work is performed, and not less than the general prevailing rate of per diem wages for legal holiday and overtime work in said locality, which per diem wages shall not be less than the stipulated rates contained in a schedule thereof which has been ascertained and determined by the Director of the State Department of Industrial Relations to be the general prevailing rate of per diem wages for each craft or type of workman or mechanic needed to execute this contract.

J. Statement acknowledging that the Town of Windsor does not have equipment or facilities to unload pump and trailer unit(s). The Town will not receive and shall not be responsible to unload any unit.

Section 4 – EVALUATION AND SELECTION CRITERIA

Each bid will be independently evaluated for completeness by staff and will be reviewed and scored based on the following criteria:

- Total bid amount including tax, delivery, destination, and any other ancillary charges.
- Thoroughness of compliance with itemized bid specifications.
- Evaluation of alternate submittals of equal to or better products.
- Bidder qualifications.

- The selection will be made to the lowest responsible bidder who meets the requirements of these specifications, terms, and conditions herein.
- Awards may also be made to the subsequent lowest responsible bidders who will be considered the back-up Vendors and who will be called in ascending order of amount of their quotation.
- After evaluating all bid submittals, the lowest qualified bidder will be determined.
- A recommendation will be made to the Windsor Town Council for an award of bid to the selected company.

Section 5 – CONTRACT

The Town's Bidder Information and Acceptance Form (Attachment A) will be considered acceptable to the successful consultant unless the consultant notifies the Town of any exceptions in writing at the time the proposal is submitted.

Section 6 - INSURANCE
Not used.

Section 7- QUESTIONS AND ADDENDA

If your firm intends to submit an IFB, in order to ensure that all interested firms are notified of such clarifications or corrections, please provide one email contact to the Town Project Manager as soon as possible.
Questions on this Invitation for Bids can be addressed **via email or telephone by no later than August 8, 2022 at 5:00 p.m**. to the Town Project Manager listed on the cover of this IFB.
Should addenda be needed, a copy will be sent by email to all firms who previously expressed interest in bidding by notifying the Project Manager via email and posted on the Town's website prior to the proposal due date. All addenda shall become part of this IFB. Please note that Town of Windsor business hours are Monday – Thursday, 7:00 a.m. - 6:00 p.m.

Section 8 – LOBBYING

With the exception of contacting work staff to ask questions regarding this IFB, any party submitting an IFB of party representing a Consultant shall not lobby any Town of Windsor Council Member or staff, agent or evaluation panel member regarding this IFB. Any party attempting to influence the bid process through ex parte contact may have their bid rejected.

Section 9 – RESERVATIONS

- Town of Windsor reserves the right to reject any and all bids and to waive minor irregularities to any bid.
- Town of Windsor reserves the right to request clarification of information submitted and to request additional information from the vendor.
- Town of Windsor reserves the right to award the contract to the next most qualified vendor if the successful vendor does not execute a contract within sixty (60) days after the award of the contract has been announced.

- Any quote may be withdrawn up to the date and time set in this IFB. Any bid not timely withdrawn shall constitute an irrevocable offer for a period of one hundred twenty (120) days to sell to the Town of Windsor the equipment described in the following specifications.
- The contract or purchase order resulting from acceptance of a bid by Town of Windsor shall be in a form supplied or approved by Town of Windsor and shall reflect the specifications in this IFB. Town of Windsor reserves the right to reject any proposed agreement or contract that does not conform to the specifications contained in this IFB and which is not approved by Town of Windsor.
- Town of Windsor shall not be responsible for any cost incurred by the vendor in preparing, submitting, or presenting its response to the IFB.
- All bids, documents, and forms will become the property of Town of Windsor upon delivery and acceptance of the sealed proposal.

Section 10 – PROCESS AND SCHEDULE

1. Instructions to Bidders

A. All bids must be submitted to:

Town of Windsor
Attn: GORMAN-RUPP 4" PUMP AND TRAILER IFB
David Ernst
P.O. Box 100
9291 Old Redwood Highway
Windsor, CA 95492
(707) 838-5328
dernst@townofwindsor.com

B. All bids must be in a sealed envelope and clearly marked on the front: **IFB – GORMAN-RUPP 4" SELF-PRIMING SEWAGE PUMP AND TRAILER Purchase**. All bids must be received by 5:00 p.m. Pacific Time on August 15, 2022. Submissions received after that time, even if postmarked earlier, will be disregarded. All bids will be reviewed and assessed for completion to make sure they meet the Town's requirements. One (1) copy of the IFB must be provided to the Town of Windsor with the following forms attached:

- Windsor Bidder Acceptance Form;
- Windsor Bid Form

No faxed or telephone bids will be accepted. E-mail submissions may be accepted only upon prior notice and approval by the Town.

C. Bids should be prepared simply and economically, utilizing the attached bid form. Factory brochures, special bindings, colored displays, promotional materials, etc., are not desired. Emphasis should be on completeness and clarity of content.

Use of recycled paper for requests and any printed or photocopied material created pursuant to a contract with Town of Windsor as well as use of both sides of paper sheets for any submittal to Town of Windsor is desirable whenever practical.

D. Town of Windsor will answer any questions up to the deadline date of the IFB and will notify the selected vendor upon approval.

E. All bids must include the following information:

1. The names and contact information of individuals who will be working on the quote and their areas of responsibility.
1. An accurate mailing address of the firm or organization.
2. Itemized breakdown of the 4" pump , equipment, and features.
3. The final pricing including additional fees, discounts, rebates, equipment, and taxes.
4. Timeline outlining the order, shipment, and delivery of the equipment.
5. Statement that all bids are good for one hundred twenty (120) days.
6. Vendors submitting alternates to the GORMAN-RUPP 4" SELF-PRIMING SEWAGE PUMP AND TRAILER and optional equipment listed must provide written documentation and proof of their submission being equal to or better than the above-described specifications and as fully described in writing with accompanying documentation.

2. Schedule

Town of Windsor will maintain the following time schedule and select a qualified vendor for the purchase of the 4" pump once all bids are received by the deadline submission date.

Issue Invitation for Bids	July 18, 2022
Questions Deadline	August 8, 2022
Deadline for Submission of Bids	August 15, 2022 @ 5 p.m.
Award Notification	August 18, 2022
Town Council Approval (tentative)	September 21, 2022

APPENDIX A
WINDSOR BIDDER INFORMATION AND ACCEPTANCE FORM

1. The undersigned declares that the Bid Documents, including, without limitation, the IFB, Addenda, and Appendices have been read.
2. The undersigned is authorized, offers, and agrees to furnish the articles and/or services specified in accordance with the Specifications, Terms & Conditions of the Bid Documents of this IFB.
3. The undersigned has reviewed the Bid Documents and fully understands the requirements in this Bid including, but not limited to, the requirements under the Town's Purchasing Provisions, and that each Bidder who is awarded a contract shall be, in fact, a prime contractor, not a subcontractor, to Town, and agrees that its Bid, if accepted by Town, will be the basis for the Bidder to enter into a purchase agreement or purchase order with Town in accordance with the intent of the Bid Documents.
4. The undersigned acknowledges receipt and acceptance of any and all addenda.
5. The undersigned acknowledges that Bidder will be in good standing in the State of California, with all the necessary licenses, permits, certifications, approvals, and authorizations necessary to perform all obligations in connection with this IFB and associated Bid Documents.
6. It is the responsibility of each bidder to be familiar with all of the specifications, terms and conditions. By the submission of a Bid, the Bidder certifies that if awarded a purchase agreement or purchase order they will make no claim against the Town based upon ignorance of conditions or misunderstanding of the specifications.
7. Patent indemnity: Vendors who do business with the Town shall hold the Town of Windsor, its officers, agents and employees and volunteers, harmless from liability of a nature or kind, including cost and expenses, for infringement or use of any patent, copyright or other proprietary right, secret process, patented or unpatented invention, article or appliance furnished or used in connection with the contract or purchase order.
8. The undersigned acknowledges ***ONE*** of the following (please check only one box):

   ☐ Bidder _____ (name of bidder) is NOT local to the Town of Windsor and is not eligible for any bid preference; **or**

   ☐ Bidder _____ (name of bidder) is LOCAL to the Town of Windsor and is requesting 5% bid preference, and has attached the following documentation to this Appendix:

   - Copy of a verifiable business license, issued by the Town of Windsor.

Official Name of Bidder: _____
Street Address Line 1: _____
Street Address Line 2: _____
City: _____ State: _____ Zip Code: _____
Webpage: _____

Type of Entity / Organizational Structure (check one):

☐ Corporation ☐ Joint Venture
☐ Limited Liability Partnership ☐ Partnership
☐ Limited Liability Corporation ☐ Non-Profit / Church
☐ Other: _____

Jurisdiction of Organization Structure: _____
Date of Organization Structure: _____

Primary Contact Information:
Name / Title: _____
Telephone Number: _____ Fax Number: _____
E-mail Address: _____
SIGNATURE: _____
Name and Title of Signer: _____
Dated this _____ day of _____ 20____

APPENDIX B
4" PUMP BID SCHEDULE FORM

Bidder hereby certifies to Town of Windsor that all representations, certifications, and statements made by Bidder, as set forth in this Bid Form and attachments are true and correct and are made under penalty of perjury pursuant to the laws of California.

Item No.	DESCRIPTION	U/M	EST. QTY.	UNIT COST	EXTENDED COST
1	GORMAN-RUPP FOUR-INCH (4") SELF-PRIMING PUMP DRIVEN BY A LIQUID-COOLED DIESEL ENGINE. PUMP SHALL HAVE LIQUID LEVEL CONTROL SYSTEM. PUMP AND ENGINE SUITABLE TO BE MOUNTED ON HIGHWAY TRAILER OR DOT WHEEL KIT, OR EQUIVALENT, AND ALL STANDARD EQUIPMENT SHOWN IN THE ATTACHED APPENDIX C.	LS	1	$	$
2	FACTORY MOUNTED ON A TWO-WHEEL HIGH SPEED WHEEL KIT RATED FOR 55 MPH. THE WHEEL KIT SHALL BE EQUIPPED WITH P225/75R15 PNEUMATIC TIRES, ADJUSTABLE FRONT AND REAR VERTICALLY ADJUSTABLE PIN TYPE SUPPORT STANDS, AND A LUNETTE EYE OR BALL TYPE HITCH OR EQUIVALENT	LS	1	$	$
3	OPTIONAL EQUIPMENT- SEE ATTACHED APPENDIX C	LS	1	$	$
4	DELIVERY AND SHIPPING FOB	LS	1	$	$
6	**TOTAL COST**	$		$	$
7	**SALES TAX (8.25%)**	$		$	$
8	**GRAND TOTAL COST**	$		$	

WRITTEN TOTAL AMOUNT:

_____

SIGNATURE: _____ DATE: _____

APPENDIX C
MINIMUM 4" PUMP & EQUIPMENT REQUIREMENTS

SPECIFICATIONS FOR A GORMAN-RUPP
SELF-PRIMING CENTRIFUGAL PUMP MODEL T4A60S-4LE2T FT4
With Auto-Start Control

PART – GENERAL

Four-inch (4") self-priming pump driven by a liquid-cooled diesel engine. Pump shall have liquid level control system. Pump and engine suitable to be mounted on highway trailer or DOT wheel kit.

1.01 Performance Criteria

A. Pump must be designed to handle raw unscreened domestic sanitary sewage, industrial waste, trash or debris. Pump shall have 4-inch suction connection, and 4-inch discharge connection. Each pump shall be selected to perform under following operating conditions:

At an engine speed of 2,050 rpm, the pump shall be capable of reaching a maximum head of 150 feet, and a maximum flow rate of 800GPM. Pump shall be capable of the following condition points:

Duty Point #1 – 10' static suction lift – 725 GPM @ 60' TDH
Duty Point #2 – 15' static suction lift – 632 GPM @ 80' TDH
Duty Point #3 – 25' static suction lift – 373 GPM @ 100' TDH

B. Pump Performance Certifications

1. Solids Handling Capability

a. All internal passages, impeller vanes, and recirculation ports shall pass a 3-inch spherical solid. Screens or smaller internal passages that create a maintenance nuisance or interfere with priming and pump performance shall not be permitted. Upon request from the engineer, manufacturer's certified drawings showing size and location of the recirculation port(s) shall be submitted for approval.

C. Reprime Performance

1. Consideration shall be given to the service anticipated, in which debris is expected to lodge between the suction check valve and its seat, resulting in the loss of the pump suction leg, and siphoning of liquid from the pump casing to the approximate center line of the impeller. Such occurrence shall be considered normal, and the pump must be capable of automatic, unattended operation with an air release line installed.

2. During unattended operation, the pump shall retain adequate liquid in the casing to

insure automatic repriming while operating at its rated speed in a completely open system. The need for a suction check valve or external priming device shall not be required

3. Pump must reprime 25 vertical feet at the maximum continuous speed and impeller diameter. Reprime lift is defined as the static height of the pump suction above the liquid, while operating with only one-half of the liquid remaining in the pump casing. The pump must reprime and deliver full capacity within five minutes after the pump is energized in the reprime condition. Additional standards under which reprime tests shall be conducted are:

    a. Piping shall incorporate an open discharge line.

    b. A length of air release pipe shall be installed between pump and the discharge check valve. This line shall be open to atmosphere at all times duplicating the air displacement rate anticipated at a typical pump station fitted with an air release valve.

    c. The pump suction check valve shall be removed. No restrictions in the pump or suction piping will prevent the siphon drop of the suction leg. Suction pipe configuration for reprime test shall incorporate a 2 feet minimum horizontal run, a 90^{o} elbow and vertical run at the specified lift. Pipe size shall be equal to the pump suction diameter.

    d. Impeller clearances shall be set as recommended in the pump service manual.

    e. Repeatability of performance shall be demonstrated by testing five consecutive reprime cycles. Full pump capacity (flow) shall be achieved within five minutes during each cycle.

    f. Liquid to be used for repriming test shall be water.

    g. Upon request from the engineer, certified reprime performance test results, prepared by the manufacturer, and certified by a registered professional engineer, shall be submitted for approval prior to shipment.

1.02 Manufacturer's Warranty

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

B. All equipment, apparatus, and parts furnished shall be warranted for sixty (60) months, excepting only those items that are normally consumed in service, such as oils, grease, packing, gaskets, O-rings, etc. The pump manufacturer shall be solely responsible for warranty of the pump equipment and all components.

C. Components failing to perform as specified by the engineer, or as represented by the

manufacturer, or as proven defective in service during the warranty period, shall be replaced, repaired, or satisfactorily modified by the manufacturer.

D. It is not intended that the pump manufacturer assume liability for consequential damages or contingent liabilities arising from failure of any vendor supplied product or part which fails to properly operate, however caused. Consequential damages resulting from defects in design, or delays in delivery are also beyond the manufacturer's scope of liability.

E. This limited warranty shall be valid only when installation is made and use, and maintenance is performed in accordance with manufacturer recommendations. The warranty shall become effective on the date of acceptance by the purchaser or the purchaser's authorized agent, or sixty (60) days after installation, or ninety (90) days after shipment from the factory, whichever occurs first.

PART 2 - PRODUCT

2.01 Manufacturer

A. The specifications and project drawings depict equipment and materials manufactured by The Gorman-Rupp Company which are deemed most suitable for the service anticipated. It is not intended, however, to eliminate other products of equal quality and performance. The contractor shall prepare his bid based on the specified equipment for purposes of determining low bid. Award of a contract shall constitute an obligation to furnish the specified equipment and materials.

B. In order to unify responsibility for proper operation, it is the intent of these Specifications that all system components be furnished by a single supplier (unitary source) and that source shall be the pump manufacturer. The pumps must be of standard catalog design, totally warranted by the manufacturer. Under no circumstances will a system consisting of parts compiled and assembled by a manufacturer’s representative or distributor be accepted.

C. Manufacturer must show proof of original product design and testing. Products violating intellectual property regulations shall not be allowed, as they may violate international law and expose the user or engineer to unintended liabilities. “Reverse-engineered” products fabricated to substantially duplicate the design of original product shall not be allowed, as they may contain substantial differences in tolerances and material applications addressed in the original design, which may contribute to product failure.

D. The term “pump manufacturer” shall be defined as the entity which designs, machines, assembles, hydraulically tests and warranties the final product. Any entity that does not meet this definition will not be considered a “pump manufacturer and is not an acceptable supplier. For quality control reasons and future pump and parts availability, all major castings of the pump shall be sourced and machined in North America.

E. After execution of the contract, the contractor may offer substitutions to the specified equipment for consideration. The equipment proposed for substitution must be superior in construction and performance to that specified in the contract, and the higher quality must

be demonstrated by a list of current users of the proposed equipment in similar installations.

F. In event the contractor obtains engineer's approval for equipment substitution, the contractor shall, at his own expense, make all resulting changes to the enclosures, buildings, piping or electrical systems as required to accommodate the proposed equipment. Revised detail drawings illustrating the substituted equipment shall be submitted to the engineer prior to acceptance.

G. It will be assumed that if the cost to the contractor is less for the proposed substitution, then the contract price shall be reduced by an amount equal to the savings.

2.02 Pump Design

A. Pump shall be a horizontal, self-priming centrifugal type, designed specifically for pumping raw unscreened domestic sanitary sewage, industrial waste, trash or debris. Pump solids handling capability and performance criteria shall be in accordance with requirements listed under PART 1 – GENERAL of this section.

B. Pumps that require external priming devices such as compressors or vacuum pumps will not be considered.

C. Pump shall have a 4-inch suction, and a 4-inch discharge connection.

D. Materials and Construction Features

1. Pump casing: Casing shall be cast iron Class 30 with integral volute scroll. Casing shall incorporate following features:

    a. Mounting feet sized to prevent tipping or binding when pump is completely disassembled for maintenance.

    b. Fill port cover plate, 3½" diameter, shall be opened after loosening a hand nut/clamp bar assembly. In consideration for safety, hand nut threads must provide slow release of pressure, and the clamp bar shall be retained by detente lugs. A Teflon gasket shall prevent adhesion of the fill port cover to the casing.

    c. Casing drain plug shall be at least 1 1/4" NPT to insure complete and rapid draining.

    d. Liquid volume and recirculation port design shall be consistent with performance criteria listed under PART 1 - GENERAL of this section.

2. Cover plate: Cover plate shall be cast iron Class 30. Design must incorporate following maintenance features:

    a. Retained by hand nuts for complete access to pump interior. Cover plate removal must provide ample clearance for removal of stoppages, and allow service to the impeller, seal, wear plate or check valve without removing suction or discharge piping.

b. A replaceable wear plate secured to the cover plate by weld studs and nuts shall be AISI 1015 HRS.

c. In consideration for safety, a pressure relief valve shall be supplied in the cover plate. Relief valve shall open at 75-200 PSI.

d. Two O-rings of Buna-N material shall seal cover plate to pump casing.

e. Pusher bolt capability to assist in removal of cover plate. Pusher bolt threaded holes shall be sized to accept same retaining caps crews as used in rotating assembly.

f. Easy-grip handle shall be mounted to face of cover plate.

3. Rotating Assembly: A rotating assembly, which includes impeller, shaft, mechanical shaft seal, lip seals, bearings, seal plate and bearing housing, must be removable as a single unit without disturbing the pump casing or piping. Design shall incorporate following features:

   a. bearing housing shall be cast iron Class 30. Separate oil filled cavities, vented to atmosphere, shall be provided for shaft seal and bearings. Cavities must be cooled by the liquid pumped. Three lip seals will prevent leakage of oil.

      1) The bearing cavity shall have an oil level sight gauge and fill plug check valve. The clear sight gauge shall provide easy monitoring of the bearing cavity oil level and condition of oil without removal of the fill plug check valve. The check valve shall vent the cavity but prevent introduction of moist air to the bearings.

      2) The seal cavity shall have an oil level sight gauge and fill/vent plug. The clear sight gauge shall provide easy monitoring of the seal cavity oil level and condition of oil without removal of the fill/vent plug.

      3) Double lip seal shall provide an atmospheric path providing positive protection of bearings, with capability for external drainage monitoring.

   b. Impeller shall be ductile iron, two-vane, semi-open, non-clog, with integral pump out vanes on the back shroud. Impeller shall thread onto the pump shaft.

   c. Shaft shall be AISI 17-4 pH stainless steel.

   d. Bearings shall be anti-friction ball type of proper size and design to withstand all radial and thrust loads expected during normal operation. Bearings shall be oil lubricated from a dedicated reservoir. Pump designs which use the same oil to lubricate the bearings and shaft seal shall not be acceptable.

   e. Shaft seal shall be oil lubricated mechanical type. The stationary and rotating seal faces shall be silicon carbide alloy. Each mating surface shall be lapped to within

three light bands flatness (35 millionths of an inch), as measured by an optical flat under monochromatic light. The stationary seal seat shall be double floating by virtue of a dual O-ring design; an external O-ring secures the stationary seat to the seal plate, and an internal O-ring holds the faces in alignment during periods of mechanical or hydraulic shock (loads which cause shaft deflection, vibration, and axial/radial movement). Elastomers shall be viton; cage and spring to be stainless steel. Seal shall be oil lubricated from a dedicated reservoir. The same oil shall not lubricate both shaft seal and shaft bearings. Seal shall be warranted in accordance with requirements listed under PART 1 - GENERAL of this section.

f. Pusher bolt capability to assist in removal of rotating assembly. Pusher bolt threaded holes shall be sized to accept same cap screws as used for retaining rotating assembly.

4. Adjustment of the impeller face clearance (distance between impeller and wear plate) shall be accomplished by external means.

   a. Clearances shall be maintained by a four-point external shimless cover plate adjustment system, utilizing a four collar and four adjusting screw design allowing for incremental adjustment of clearances by hand as required. Each of the four points shall be lockable to prevent inadvertent clearance increases or decreases due to equipment vibration or accidental operator contact. The four-point system also allows for equal clearance gaps at all points between the impeller and wear plate. Requirement of realignment of belts, couplings, etc., shall not be acceptable. Cover plate shall be capable of being removed without disturbing clearance settings. Clearance adjustment systems that utilize less than four points will not be considered.

   b. There shall be provisions for additional clearance adjustment in the event that adjustment tolerances have been depleted from the cover plate side of the pump. The removal of stainless-steel tabbed spacers from the rotating assembly side of the pump shall allow for further adjustment as described above.

   c. Clearance adjustment which requires movement of the shaft only, thereby adversely affecting seal working length or impeller back clearance, shall not be acceptable.

5. Suction check valve shall be molded Neoprene with integral steel and nylon reinforcement. A blow-out center shall protect pump casing from hydraulic shock or excessive pressure. Removal or installation of the check valve must be accomplished through the cover plate opening, without disturbing the suction piping. Sole function of check valve shall be to save energy by eliminating need to reprime after each pumping cycle. Pumps requiring a suction check valve to assist reprime will not be acceptable.

6. Spool flanges shall be one-piece cast iron, class 30 fitted to suction and/or discharge ports. Each spool shall have one 1-1/4" NPT and one 1/4" NPT tapped hole with pipe plugs for mounting gauges or other equipment.

E. The pump manufacturer shall demonstrate to the engineer's satisfaction that due consideration has been given to reducing maintenance costs by incorporating the following features:

1. No special tools shall be required for replacement of any components within the pump.

2.03 Engine

A. The engine shall be four (4) cylinder four cycle, turbocharged liquid cooled diesel engine, Isuzu model 4LE2T FT4. The engine shall have the following minimum design characteristics:

1. Displacement shall be 134 cubic inches.

2. Maximum continuous BHP shall be 48 @ 2,400 RPM.

3. Governor shall be mechanical.

4. Forced circulation lubrication.

5. Dry type air cleaner.

6. Oil reservoir shall be 11.0 quarts capacity

7. Fuel tank shall be 70 U.S. gallons minimum and shall be furnished with a 36.6-hour minimum operating time at full load.

8. Starter shall be 12 volts.

B. Engine Autostart Control Panel to include the following features:

1. LCD display with backlighting.

2. Safety shutdown switches / indicators for low oil pressure, engine over crank, and high coolant temperature.

3. Displayed values for:
   a. Engine RPM
   b. Run Time
   c. Battery Voltage
   d. Coolant Temperature
   e. Oil Pressure

4. Fault indication for:
   a. Low oil pressure
   b. High temperature
   c. Over crank

5. Engine MANUAL/STOP/AUTO key switch with key removable in any position.

6. Warning alarm for eight seconds prior to start-up.

7. I.D. tags or equal applied:
   a. Throttle
   b. Float switch input only
   c. Circuit breaker
   d. MANUAL/OFF/AUTO

8. 10 Amp Pushbutton Circuit Breaker

9. Float switch connector in bottom of box adjacent to wiring harness connector.

C. Additional features shall include:

1. Radiator with drain valve on bottom of radiator.

2. Engine oil drain provisions.

3. Muffler with guard and weather cap.

D. Because the engine shall be required to operate during emergency situations, the following minimum performance standards shall be used for engine selection:

1. Engine speed shall be controlled by a manually adjustable, governor-controlled throttle which shall maintain the preset speed over the range of expected pumping loads. This speed shall not be less than 1000 RPM to insure adequate cooling, nor more than 2,400 RPM so that internal engine wear is held to a minimum.

2. The engine shall develop approximately 95 percent of manufacturer's published performance after a reasonable run-in period.

3. For selection of engine size, engine performance shall be de-rated according to manufacturer's specifications to allow for decreased performance if installed at elevations more than 1000 feet above sea level.

4. For selection of engine size, engine performance shall be de-rated according to manufacturer's specifications to allow for decreased performance in an ambient temperature of 100 degrees F.

5. Engine rating shall be further reduced to conform to engine manufacturer's recommendations for continuous service applications.

2.04 Control System

A. Description

1. The engine shall be equipped with all controls and components required for manual and automatic operation when used with the engine controls and DC level control system described herein. Such components shall include, but not limited to, the following:

    a. 12-volt DC electrical system including starter and alternator.
    b. Digital elapsed running time meter.
    c. Shutdown sensors for engine temperature, oil pressure, and overspeed.
    d. Keyed switch for manual, off, or automatic operation of the engine.

2. The electrical control components shall be provided by the pump supplier and shall include the following:

    a. Indicating lights shall be LED type and shall be provided for engine over crank, engine low oil pressure, high coolant temperature, and engine overspeed. LED emitting the color Yellow shall indicate “Warning”; LED emitting the color Red shall indicated “Fault”.

    b. A six-digit elapsed time display shall be provided to indicate the total running time in "hours" and "tenths of hours".

    c. Controls shall include a micro-processor-based controller with 40-character two row LCD backlit display. It shall be housed in a lockable polycarbonate clear cover enclosure.

B. Float Switch Liquid Level Control System

1. The liquid level control system shall utilize a float switch. It shall be a mechanical non-mercury type float switch housed in a hermetically sealed polypropylene enclosure designed to extend into the wet well. The float switch cable shall be 50 feet minimum length for proper installation into the wet well without splicing.

2. The level control system shall continuously monitor the wet well level. Upon operator selection of automatic operation, the level controller shall start the pump unit when the liquid level in the wet well rises to the pump start level. When the liquid is lowered to the pump stop level, the level controller shall stop this pump.

C. Engine control system

1. The engine control system shall be designed to accomplish the following tasks:

    a. Permit the operator to select mode of engine operation, providing manual start and stop of the engine to override the level control system.

    b. Crank the engine upon start command from the level control system, and stop the engine upon a stop command.

c. Stop the cranking sequence if the engine fails to start after a reasonable number of attempts, and to provide an audible alarm indication of failure to start.

d. While the engine is operating, continuously monitor engine speed, temperature and oil pressure.

e. Stop the engine for excessive speed, excessive coolant temperature, or insufficient oil pressure, and provide an alarm indication of shutdown and its cause. If any of these parameters approach a shutdown condition, an audible alarm will sound and the parameter in question will flash before an actual shutdown occurs.

2. Sequence of operation

a. Upon operator selection of automatic operation, when the level control system provides a start command, the engine control system shall start the engine cranking motor for a short period of time. If the engine does not start, the system shall stop the cranking motor for a short period of time, then resume cranking. Typically, five 10-second cranking periods, each followed by a 10-second rest period, should be considered a reasonable effort to start the engine. When the engine starts, a sensor shall stop the cranking cycle and reset the cranking circuit for the next start.

b. If the engine does not start within the preset number of attempts, the cranking circuit shall be de-energized, and an over crank status indication shall be displayed on the LCD panel.

c. Once the engine has started normally, the engine control system shall monitor and display engine speed, coolant temperature, system voltage, run time, and oil pressure. Upon engine failure from any cause, system shall provide an alarm indication, and illuminate an indicator.

3. Circuit details

a. Switches or other devices shall be provided and connected to perform as follows:

1) When automatic operation is selected, engine shall start and stop under control of the level control and engine control system.

2) When manual operation is selected, the operator will be prompted to push and hold the “enter” button on the control panel to start the engine. Once started, engine shall run until "OFF" is selected, or the engine failure circuit stops the engine.

3) Operator can stop engine if it is running, and prevent it from starting during maintenance or repair.

4) Engine failure circuits shall stop the engine, illuminate an LED, and display on LCD display on the control panel, for each of the following conditions:

a) Engine speed exceeds maximum overspeed setting.

b) Engine temperature exceeds safe operating temperature as specified by the engine manufacturer.

c) Engine oil pressure falls below engine manufacturer's specified recommendations.

d) Engine fails to start after several attempts.

b. Operating power for the engine and level control system shall be provided by the storage battery furnished with the engine.

2.05 Gauge Kit

A. Description: A gauge kit shall be supplied for pump. Suction pressure must be monitored by a glycerin-filled compound gauge, and discharge pressure by a glycerin-filled pressure gauge. Gauges to be at least 2.5 inches in diameter, graduated in feet water column. Rated accuracy shall be 1.5% of full-scale reading. Compound gauge shall be graduated -34 to +34 feet water column minimum. Pressure gauge to be graduated 0 to 140 feet water column minimum. Gauges to be factory mounted adjacent to the engine control panel. Gauge installations shall be complete with all hoses and fittings, including a shutoff valve for each gauge line behind the control panel.

2.06 Wheel Kit

The pump unit shall be factory mounted on a two-wheel high speed wheel kit rated or 55 MPH. The wheel kit shall be equipped with P225/75R15 pneumatic tires, adjustable front and rear vertically adjustable pin type support stands, and a lunette eye or ball type hitch.

2.07 Battery

Battery shall be minimum 75-amp hour industrial type with 900 cold cranking amps.

2.08 Spare Parts:

The Authorized Pump Distributor shall maintain all of the replacement parts needed to fully rebuild the pump as specified.

END