ROCKDALE COUNTY, GEORGIA

June 22, 2022

REBUILD HIGH SERVICE PUMPS AND MOTORS FOR #3 & #5

INVITATION TO BID
No. 22-26

ROCKDALE COUNTY FINANCE DEPARTMENT
PROCUREMENT DIVISION
958 MILSTEAD AVENUE
CONYERS, GA 30012
770-278-7552

INTRODUCTION:

This is an Invitation to Bid (ITB) for the **Rebuild High Service Pumps and Motors for #3 & #5** in Rockdale County. Instructions for preparation and submission of a bid are contained in this packet. Bids must be typed or printed in ink.

Rockdale County provides equal opportunity for all businesses and does not discriminate against any person or business because of race, color, religion, sex, national origin, and handicap or veterans' status. This policy ensures all segments of the business community have access to supplying the goods and services needed by Rockdale County.

PURCHASING CONTACT FOR THIS REQUEST:

All questions concerning this ITB and all questions arising subsequent to award are to be addressed to the Purchasing Division via email to Meagan Porch, Buyer, at meagan.porch@rockdalecountyga.gov or the following address:

Rockdale County Finance Department
Purchasing Division
Attn: Meagan Porch
958 Milstead Avenue
Conyers, GA 30012
Phone: (770) 278-7557, Fax (770) 278-8910
E-mail: meagan.porch@rockdalecountyga.gov

To maintain a "level playing field", and to assure that all bidders receive the same information, bidders are requested **NOT** to contact anyone other than the contact above until after the award of the contract. Doing so could result in disqualification of the bidder.

BID COPIES FOR EVALUATION:

Two (2) hard copies, one (1) original hard copy and one (1) Flash Drive in Adobe PDF format will be required for review purposes. *(Original must be clearly marked "Original" and the Copies clearly marked "Copies.")*. Flash Drives that are blank or have incorrect information on them will not be acceptable and may be justification for disqualification. Check your Flash Drive(s) to ensure that they have the appropriate material on it before submitting.

All bid materials must be completed and enclosed in a sealed envelope prior to submittal. The ITB number must be clearly written on the outside of the envelope. **Incomplete, incorrect, unsealed, unmarked, or improperly submitted bids may be rejected.**

CONTRACT TERM:

To be determined.

DUE DATE:

Sealed bids will be received at the Rockdale County Finance Department, Procurement Division, 958 Milstead Avenue, Conyers, GA 30012 no later than **2:00 P.M., local time, Thursday, July 21, 2022**. Bids received after this time will not be accepted. Bidders are not required to attend bid opening.

PRE-BID CONFERENCE:

There will be a **MANDATORY** Pre-Bid Conference held at the **Rockdale County Water Treatment Plant, located at 3090 Gees Mill Rd. NE, Conyers, GA 30013 at 10:00 A.M., local time, Wednesday, July 6, 2022**. Any questions and/or misunderstandings that may arise from this ITB may be asked and answered at the pre-bid conference; however, oral responses are not authoritative. Bidders are encouraged to review the ITB before attending the pre-bid conference. Questions received after the pre-bid conference must be submitted in writing to meagan.porch@rockdalecountyga.gov or at the above address. *Any contractor who intends to submit a Bid is required to attend this meeting.*

QUESTIONS AND CLARIFICATIONS:

All questions and/or requests for clarifications concerning this ITB must be submitted to the Purchasing Division via email to meagan.porch@rockdalecountyga.gov or at the above address no later than **2:00 p.m., local time, on Thursday, July 14, 2022**. It shall be the Bidders responsibility to seek clarification as early as possible prior to the due date and time. Written responses from the County to the questions it receives will be in an addendum and posted to the County's website at **www.rockdalecountyga.gov**, under Bid Opportunities. Questions or requests for clarifications received after this deadline will not receive a response.

ADDENDA:

Answers to questions submitted that materially change the conditions and specifications of this ITB will be issued in an addendum and posted to the County's website at www.rockdalecountyga.gov under Bid Opportunities. Any discussions or documents will be considered non-binding unless incorporated and issued in an addendum.

It is the bidder's responsibility to check the Rockdale County website at www.rockdalecountyga.gov, under Bid Opportunities for any addenda that may be issued, prior to submitting a bid for this ITB.

WARRANTY AND / OR GUARANTY:

The bidder will state below or will furnish a separate letter attachment which fully explains the condition of Warranty and/or Guaranty. If no Warranty and/or Guaranty is applicable, it must be so stated. NOTE: Failure to respond to the requirement of this paragraph may result in the bid being non-responsive.

_____

_____

FOREIGN PRODUCTS:

Rockdale County prefers to buy items produced and/or manufactured in the United States of America; however, foreign products may be considered provided it is so stated. Bidder certifies that item(s) offered on this bid is/are manufactured/produced in the United States.

Yes _____ No _____

If "No" state place: _____

_____

QUALIFICATIONS OF OFFERORS:

Bidders must have a current business license from their home office jurisdiction and provide a copy of that license with the submittal of their bid response. Rockdale County vendors doing business in Rockdale County must have a current Rockdale County Business License.

Bids from any offeror that is in default on the payment of any taxes, license fees, or other monies due to Rockdale County will not be accepted.

Bidders are to submit at least **three (3) three references** from projects with similar experience using the materials and process in this Invitation to Bid.

GENERAL CONTRACTOR'S LICENSE (if required by law)

As required by O.C.G.A. § 43-41-6, *et seq.*, a Bidder responding to this Invitation to Bid must provide a copy of its Georgia General Contractor's License. The Georgia General Contractor's License must be issued in the name of the Bidder. All licenses must be current, valid, and issued in compliance with applicable law. Failure to provide this license with the Bid may result in the proposed Bid being deemed non-responsive.

SILIENCE OF SPECIFICATIONS

The apparent silence of these specifications and any supplemental specifications as to any details, or the omission from it of a detailed description concerning any point, shall be regarded as meaning that only the best commercial practices are to prevail and that only materials of first quality and correct type, size and design are to be used. All workmanship is to be first quality. All interpretations of this specification shall be made upon the basis of this statement, with County interpretation to prevail.

OPTION TO AUDIT

Successful bidder will be required to maintain complete records during the life of the contract and for a period of one year after completion of the contract. Such records are to be made available to the County if officially requested, to be audited by a designated County auditing staff. In such audits reveal overcharges and/or undercharges, such will be adjusted, and compensation made by either party to correct charges.

TORT IMMUNITY:

No officer, employee, or agent of the County acting within the scope of his/her employment or function shall be held personally liable in tort or named as a defendant in any action for injury or damage suffered because of any act, event, or failure to act.

PROPRIETARY INFORMATION:

Careful consideration should be given before submitting confidential information to Rockdale County. The Georgia Open Records Act permits public scrutiny of most materials collected as part of this process. Please clearly mark any information that is considered a trade secret, as defined by the Georgia Trade Secrets Act of 1990, O.C.G.A. §10-1-760 et seq., as trade secrets are exempt from disclosure under the Open Records Act. Rockdale County does not guarantee the confidentiality of any information not clearly marked as a trade secret.

AWARD OF CONTRACT:

The Rockdale County Procurement Office and/or Evaluation Committee make a recommendation for award. The Board of Commissioners will make the actual award of the contract and has the authority to award the contract to a company different than the company recommended by the Procurement Office and/or Evaluation Committee. Rockdale County reserves the right to make no awards, multiple awards, one award for all items; or whatever the

County deems to be in its best interest.

SELECTION PROCESS:
The Rockdale County Procurement Office and/or Evaluation Committee make a recommendation for award. The Board of Commissioners will make the actual award of the contract and has the authority to award the contract to a company different than the company recommended by the Purchasing Department and/or Evaluation Committee.

This is a past performance/quality/price trade-off source selection in which competing offeror's past and present performance history and product quality will be evaluated on a basis approximately equal to price. Award will be made to the responsible offeror whose bid represents the best value after evaluation in accordance with the factors listed below. Rockdale County Board of Commissioners may reject any or all bids if such action is in the county's interest.

Rockdale County may evaluate bids and award a contract without discussions with offerors. Therefore, the offeror's initial bid should contain the offeror's best terms from a price and technical standpoint. The County reserves the right to conduct discussions if the County later determines them to be necessary.

INSURANCE:
Before starting any work, the successful contractor must furnish to Rockdale County certificate(s) of insurance from companies doing business in Georgia. The Company shall maintain in full force and effect the following insurance during the term of the Agreement:

Coverages:	Limits of Liability:
Workers' Compensation	Statutory
Employers' Liability	$1,000,000.00
Bodily Injury Liability	$1,000,000.00 each occurrence
except Automobile	$1,000,000.00 aggregate
Property Damage Liability	$1,000,000.00 each occurrence
except Automobile	$1,000,000.00 aggregate
Personal & Advertising Injury Limit	$1,000,000.00
Products / Completed Ops.	$2,000,000.00 aggregate
Automobile Bodily Injury	$1,000,000.00 each person
Liability	$1,000,000.00 each occurrence
Automobile Property Damage	$1,000,000.00 each occurrence
Liability	
(If hazardous substances are involved)	
Contractor's Pollution Liability (with 1-year extended reporting period)	
Each Occurrence	$1,000,000.00
Aggregate	$2,000,000.00
Environmental Impairment Liability (with 1-year extended reporting period)	
Each Occurrence	$1,000,000.00
Aggregate	$2,000,000.00
General Liability	$1,000,000.00

All insurance shall be provided by an insurer(s) acceptable to the County and shall provide for thirty (30) days prior notice of cancellation to the County. Upon contract award, Contractor shall deliver to the County a certificate or policy of insurance evidencing Contractor's compliance with this paragraph. Contractor shall abide by all terms and conditions of the insurance and shall do nothing to impair or invalidate the coverage.

Rockdale, GA shall be named as Additional Insured under any General Liability, Business Auto and Umbrella Policies using ISO Additional Insured Endorsement forms CG 2010 or its equivalent. Coverage shall apply as Primary and non-contributory with Waiver of Subrogation in favor of Rockdale County, Georgia.

The insurance carrier must have a minimum rating of A or higher as determined by the rating firm A.M. Best.

Certificates must contain policy number, policy limits, and policy expiration date of all policies. The Invitation to Bid (ITB) number and project name must be inserted in the Description of Operations section of the certificate.

Certificates are to be issued to:
Rockdale County, Georgia
958 Milstead Avenue
Conyers, GA 30012

BONDS:

Rockdale County shall request the following for bids/proposals in excess of Fifty Thousand Dollars ($50,000.00).

BID BOND

Each bid shall include a bid bond in the amount of five percent (5%) of the total bid amount as guarantee that the bidder shall not withdraw the bid for 120 days after the scheduled bid opening. If awarded the contract, Bidders shall enter a written agreement with Rockdale County in accordance with the bid.

PERFORMANCE BOND

Upon execution and delivery of the contract, the bidder shall furnish Rockdale County a performance bond for the full amount of the contract. Maintenance provisions of the bond shall remain in effect for a period of twelve (12) months after acceptance of the work by the County. The surety shall be a reputable bonding company authorized to transact business in the State of Georgia.

PAYMENT BOND

Upon execution and delivery of the contract, the bidder shall furnish Rockdale County a payment bond for the full amount of the contract. Maintenance provisions of the bond shall remain in effect for a period of twelve (12) months after acceptance of the work by the County. The surety shall be a reputable bonding company authorized to transact business in the State of Georgia.

All sureties of bonds for Rockdale County must be licensed to do business in the State of Georgia and must be listed on the Department of Treasury Federal Register.

PERMITS:

The awarded contractor will be responsible for acquiring any permits that are required for this project/purchase. Rockdale County will waive fees on all permits issued by Rockdale County.

ILLEGAL IMMIGRATION REFORM AND ENFORCEMENT ACT OF 2011

Vendors submitting a Qualification package in response to this ITB must complete the Contractor Affidavit under O.C.G.A. §13-10-91(b)(1) which is provided with the ITB package to verify compliance with the Illegal Immigration Reform and Enforcement Act of 2011.

A. The form must be signed by an authorized officer of the contractor or their authorized agent.

B. The form must be notarized.

C. The contractor will be required to have all subcontractors and sub-subcontractors who are engaged to complete physical performance of services under the final contract executed between the County and the contractor complete the appropriate subcontractor and sub-subcontractor affidavits and return them to the County a minimum of five (5) days prior to any work being accomplished by said subcontractor or sub-subcontractor. Format for this affidavit can be provided to the contractor if necessary.

LIQUIDATED DAMAGES

Time is of the essence and is an essential element of this Contract, and the Contractor shall pay to the County, not as a penalty, but as liquidated damages, the sum of $100.00 for each calendar day that there is default of completing the Work within the time limit named herein. If the Contractor abandons the Contract before commencement of the Work or defaults in completion of all the Work after commencement thereof, the Contractor shall be liable for such liquidated damages. These fixed liquidated damages are not established as a penalty but are calculated and agreed upon in advance by the County and the Contractor due to the uncertainty and impossibility of making a determination as to the actual and consequential damages incurred by the County and the general public of Rockdale County, Georgia as a result of the failure on the part of the Contractor to complete the Work on time. Such liquidated damages referred to herein are intended to be and are cumulative and shall be in addition to every other remedy now or hereafter enforceable at law, in equity, by statute, or under the Contract.

PIGGYBACKING

Rockdale County encourages and agrees to the successful bidder extending the pricing, terms and conditions of this solicitation or resultant contract to other governmental entities at the discretion of the successful bidder.

GENERAL INFORMATION:

RECEIPT OF BID:
No bids received after said time or at any place other than the time and place as stated in the notice shall be considered. No responsibility shall attach to Rockdale County for the premature opening of a bid not properly addressed and identified.

WITHDRAWAL OF BID:
A bidder may withdraw his bid before the bid due date, without prejudice to the bidder, by submitting a written request of withdrawal to the Rockdale County Procurement Office.

REJECTION OF BID:
Rockdale County may reject any and all bids and must reject a bid of any party who has been delinquent or unfaithful in any formal contract with Rockdale County. Also, the right is reserved to waive any irregularities or informalities in any bid in the proposing procedure. Rockdale County shall be the sole judge as to which bid is best, and in ascertaining this, will take into consideration the business integrity, financial resources, facilities for performing the work, and experience in similar operations of the various bidders.

STATEMENT OF EXPERIENCE AND QUALIFICATIONS:
The bidder may be required, upon request, to prove to the satisfaction of Rockdale County that he/she has the skill, experience, necessary facilities and ample financial resources to perform the contract(s) in a satisfactory manner and within the required time. If the available evidence of competency of any bidder is not satisfactory, the bid of such bidder may be rejected. The successful bidder is required to comply with and abide by all applicable federal and state laws in effect at the time the contract is awarded.

NON-COLLUSION AFFIDAVIT:
By submitting a bid, the bidder represents and warrants that such bid is genuine and not sham or collusive or made in the interest or in behalf of any person not therein named, that the bidder has not directly or indirectly induced or solicited any other bidder to put in a sham bid, or any other person, firm or corporation to refrain from proposing and that the bidder has not in any manner sought by collusion to secure to that bidder any advantage over any other bidder.

INTEREST OF:
By submitting a bid, the bidder represents and warrants that a Commissioner, Administrator, employee, nor any other person employed by Rockdale County has, in any manner, an interest, directly or indirectly, in the bid or in the contract which may be made under it, or in any expected profits to arise therefrom.

DOCUMENTS DEEMED PART OF THE CONTRACT:
The notice, invitation to bidders, general conditions, and instructions for bidders, special conditions, specifications, bid, and addenda, if any, will be deemed part of the contract.

GOVERNING LAWS:
This contract is made under and shall be governed and construed in accordance with the laws of the State of Georgia.

ERRORS AND OMISSIONS:
The vendor shall not take advantage of any errors or omissions in this Bid Request, and shall promptly notify Rockdale County of any omissions or errors found in this document.

STANDARD INSTRUCTIONS:

1. The instructions contained herein shall be construed as a part of any bid invitation and/or specifications issued by Rockdale County and must be followed by each bidder.

2. The written specifications contained in this bid shall not be changed or superseded except by written addendum from Rockdale County. Failure to comply with the written specifications for this bid may result in disqualification by Rockdale County.

3. All goods and materials shall be F.O.B. Destination Conyers, Georgia and no freight or postage charges will be paid by Rockdale County unless such charges are included in the bid price.

4. The following **ITB# 22-26** must be written clearly on the outside of each bid envelope in order to avoid prior opening in error.

5. All bids must be received and in-hand at bid due date and time. Each bidder assumes the responsibility for having his/her bid received at the designated time and place of bid due date. Bids received after the stated time and date may be subject to rejection without consideration, regardless of postmark. Rockdale County accepts no responsibility for mail delivery.

6. Unless otherwise stated, all bids submitted shall be valid and may not be withdrawn for a period of 120 days from the due date.

7. Each bid form submitted must include the name of the business, mailing address, the name, title and signature of the person submitting the bid. When submitting a bid to Rockdale County the first page of your bid package should be the bid form listing the price, delivery date, etc., unless the bid form is requested to be in a separate envelope.

8. Rockdale County reserves the right to accept a bid that is not the lowest price if, in the County's judgment, such bid is in the best interest of the County and the public. The County reserves the right to reject any and all bids.

9. Telephone, Emailed or Facsimile bids will not be accepted.

10. No sales tax will be charged on any orders except for contracts that include construction materials being purchased through a third party.

    Federal I.D. #58-6000882
    Sales Tax Exempt #58-800068K

11. If applicable, completed questionnaires must be signed manually. Rockdale County reserves the right to accept or reject any bid on the basis of incomplete or inaccurate answers to the questionnaire.

12. If applicable, warranty information shall be provided.

13. Bidders shall state delivery time after receiving order.

14. Bidders shall identify any subcontractors, and include an explanation of the service or product that they may provide.

BID SPECIFICATIONS:

The specifications are as follows and on the attached pages:

General:

Purchase Price shall include delivery, F.O.B. Rockdale County, Conyers, GA 30012.

Warranty information must be provided with the submittal of bid.

All manuals associated with the equipment must be delivered with the equipment at no additional charge to Rockdale County. Manuals included but not limited to: Electrical, Pump, Wiring, Mechanical, Operational, Parts, Service, etc.

Rockdale County Water Treatment Plant: High Service Pumps and Motors, #3 & #5 Rebuilds

Scope of work:

Rockdale Water Treatment Plant request sealed bids for the removal/Installation and rebuild of two (2) high service pumps and motors (P-8-3 and P-8-5). Located in the High Service Building at 3090 Gees Mill Road Conyers GA 30013. Scope of Service to include removal and rebuild of the pumps, and motors; install and perform startup as conditions allow (working with Operations and Maintenance Staff) and perform vibration test for base line. Check for leaks and proper operation. Removal and rebuild of one (1) pump and motor at a time to keep operation status of the Treatment Plant. Remove pump and motor, perform repair/rebuild, reinstall pump and motor, test and set to run before removing of the second pump.
The successful bidder should supply all personnel including experienced Supervisor and equipment to perform the removal/installation and rebuild/repair of 2 Ingersoll-Dresser 300LNN600 split case pumps and motors. All personnel should be qualified with the specific task required to perform the work described below.

We request the use of OEM parts where possible.

Caution:

All work should be performed in a safe manner following all Lockout/Tagout Procedures and general safety guidelines to insure a safe working environment. Water Treatment Plant Maintenance personnel will assist in isolation of the pumps. Time may be required to assure pump is totally isolated using the inlet and outlet control valves/plugs of each pump.

Current Specs:

Pump P-8-3
Ingersoll-Dresser 300LNN600 Split Case Pump
Serial #. 0107MS001588-1
6000 GPM
1775 RPM max

Motor
700 HP Baldor Inverter duty motor
1791 RPM
SN#. K1401080011
CAT#. A50-1257-4916
480-volt Eaton drive

Pump P-8-5
Ingersoll-Dresser 300LNN600 Split Case Pump
Serial #. 0107MS001588-3
6000 GPM
1775 RPM max

Motor
700 HP Baldor Inverter duty motor
1791 RPM
SN# K1401080001
CAT#. A50-1257-4916
480 Volt Eaton drive

Pumps Rebuild:

- Disconnect from piping, motor, and remove pump from stand.
- Transport to repair facility.
- Disassemble pump completely.
- Clean all parts to be reused.
- Inspect and record all critical dimensions.
- Inspect impeller for wear and cavitation and repair.
- Perform machining of pump case where needed to bring back into factory specifications.
- Perform machining or replace
  a) Impeller wear rings
  b) Case wear rings
- Provide and install the following parts.
  a) Shaft bearings
  b) Mechanical seals
  c) All case gaskets and O-rings needed for pump and pump installation
- Dynamically balance the impeller to within ISOG 1.0 specification.
- Assemble the pump complete using new gaskets.
- Lube bearings according to factory specifications.
- Prepare pump case and paint using the factory specification paint with current color.
- Deliver pump to Rockdale Water High Service Building, install onto pump base, and connect to piping using new gaskets.
- Perform startup, test, and perform baseline vibration test on unit.
- Provide reports on any repairs required during the rebuild process of the pump and provide written warranty information.
- Replace the Faulk coupling (complete) with new one and lubricate.

Motors:

- Disconnect from pump and remove from stand
- Transport motor to a certified repair shop
- Disassemble motor completely.
- Clean and inspect all parts.
- Check and test all windings and rotor bars for problems.
- Clean, Dip, and bake windings.
- Paint to factory specifications
- Report any problems found.
- If all parts test good, rebuild with new bearings, seals, and paint.
- Balance unit according to factory standards.
- Return to work site, install with pump, and perform startup.

Additional:

- Provide all shipping cost in the bid quote.
- Report any additional required machining or repairs of pump or motor to Rockdale water plant management.
- No work outside of scope shall be performed without approval from Rockdale water plant management.
- Perform vibration testing during start up by a certified vibration analyst.
- A 5-ton overhead bridge crane is in the high service pump building and can be used for the removal/installation of the pump and motor.

BID FORM – ITB No. 22-26

Instructions: Complete all THREE parts of this bid form.

PART I: Bid Summary

Complete the information below. If you wish to submit more than one brand, make a photocopy of this Bid Form.

1.	Total Bid Amount	$
2.	Contingency – 10% of Total Bid Amount	$
3.	**Lump Sum Bid Price**	$
4.		$
5.		$
6.		$

PART II: Addenda Acknowledgements (if applicable)

Each vendor is responsible for determining that all addenda issued by the Rockdale County Finance Department – Purchasing Division have been received before submitting a bid.

Addenda	Date Vendor Received	Initials
"1"		
"2"		
"3"		
"4"		
"5"		
"6"		

PART III: Vendor Information:

Vendor Name	
Address	
Telephone	
E-Mail	
Representative (print name)	
Signature of Representative	
Date Submitted	

ROCKDALE COUNTY BOARD OF COMMISSIONERS
NON-COLLUSION AFFIDAVIT OF VENDOR

State of _____)

County of _____)

_____, being first duly sworn, deposes and says that:

(1) He/She is_____ (owner, partner officer, representative, or

agent) of _____, the Vendor that has submitted the attached ITB;

(2) He/She is fully informed respecting the preparation and contents of the attached ITB and of all pertinent circumstances respecting such ITB;

(3) Such ITB is genuine and is not a collusive or sham ITB;

(4) Neither the said Vendor nor any of its officers, partners, owners, agents, representatives, employees or parties in interest, including this affidavit, has in any way colluded, conspired, connived or agreed, directly or indirectly with any other Vendor, firm or person to submit a collusive or sham ITB in connection with the Contract for which the attached ITB has been submitted or refrain from proposing in connection with such Contract, or has in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other Vendor, firm or person to fix the price or prices in the attached ITB or of any other Vendor, or to fix any overhead, profit or cost element of the proposing price or the proposing price of any other Vendor, or to secure through any collusion, conspiracy, connivance or unlawful agreement any advantage against Rockdale County or any person interested in the proposed Contract; and

(5) The price or prices quoted in the attached ITB are fair and proper and are not tainted by any collusion, conspiracy, connivance or unlawful agreement on the part of the Vendor or any of its agents, representatives, owners, employees, or parties in interest, including this affidavit.

_____
(Signed)

_____
(Title)

Subscribed and Sworn to before me this _____ day of _____, 202__

Name_____

Title_____
My commission expires (Date)

ROCKDALE COUNTY BOARD OF COMMISSIONERS
NON-COLLUSION AFFIDAVIT OF SUB-CONTRACTOR

State of _____)

County of _____)

_____, being first duly sworn, deposes and says that:

(1) He/She is_____ (owner, partner officer, representative, or

agent) of _____, the sub-contractor that has submitted the attached ITB;

(2) He/She is fully informed respecting the preparation and contents of the attached ITB and of all pertinent circumstances respecting such ITB;

(3) Such ITB is genuine and is not a collusive or sham ITB;

(4) Neither the said sub-contractor nor any of its officers, partners, owners, agents, representatives, employees or parties in interest, including this affidavit, has in any way colluded, conspired, connived or agreed, directly or indirectly with any other Vendor, firm or person to submit a collusive or sham ITB in connection with the Contract for which the attached ITB has been submitted or refrain from proposing in connection with such Contract, or has in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other Vendor, firm or person to fix the price or prices in the attached ITB or of any other Vendor, or to fix any overhead, profit or cost element of the proposing price or the proposing price of any other Vendor, or to secure through any collusion, conspiracy, connivance or unlawful agreement any advantage against Rockdale County or any person interested in the proposed Contract; and

(5) The price or prices quoted in the attached ITB are fair and proper and are not tainted by any collusion, conspiracy, connivance or unlawful agreement on the part of the sub-contractor or any of its agents, representatives, owners, employees, or parties in interest, including this affidavit.

_____
(Signed)

_____
(Title)

Subscribed and Sworn to before me this _____ day of _____, 202___.

Name_____

Title_____
My commission expires (Date)

Contractor Affidavit under O.C.G.A. §13-10-91(b)(1)

By executing this affidavit, the undersigned contractor verifies its compliance with O.C.G.A. §13-10-91, stating affirmatively that the individual, firm or corporation which is engaged in the physical performance of services on behalf of (name of public employer) has registered with, is authorized to use and uses the federal work authorization program commonly known as E-Verify, or any subsequent replacement program, in accordance with the applicable provisions and deadlines established in O.C.G.A. §13-10-91. Furthermore, the undersigned contractor will continue to use the federal work authorization program throughout the contract period and the undersigned contractor will contract for the physical performance of services in satisfaction of such contract only with subcontractors who present an affidavit to the contractor with the information required by O.C.G.A. §13-10-91(b). Contractor hereby attests that its federal work authorization user identification number and date of authorization are as follows:

_____
Federal Work Authorization User Identification Number

_____
Date of Authorization

_____
Name of Contractor

_____
Name of Project

_____
Name of Public Employer

I hereby declare under penalty of perjury that the foregoing is true and correct.

Executed on _____, ___, 202__ in _____(city), _____(state).

_____
Signature of Authorized Officer or Agent

_____
Printed Name and Title of Authorized Officer or Agent

SUBSCRIBED AND SWORN BEFORE ME
ON THIS THE _____ DAY OF _____,202__.

_____
NOTARY PUBLIC
My Commission Expires:

_____

Subcontractor Affidavit under O.C.G.A. § 13-10-91(b)(3)

By executing this affidavit, the undersigned subcontractor verifies its compliance with O.C.G.A. § 13-10-91, stating affirmatively that the individual, firm or corporation which is engaged in the physical performance of services under a contract with (name of contractor) on behalf of (name of public employer) has registered with, is authorized to use and uses the federal work authorization program commonly known as E-Verify, or any subsequent replacement program, in accordance with the applicable provisions and deadlines established in O.C.G.A. § 13-10-91. Furthermore, the undersigned subcontractor will continue to use the federal work authorization program throughout the contract period and the undersigned subcontractor will contract for the physical performance of services in satisfaction of such contract only with sub-subcontractors who present an affidavit to the subcontractor with the information required by O.C.G.A. § 13-10-91(b). Additionally, the undersigned subcontractor will forward notice of the receipt of an affidavit from a sub-subcontractor to the contractor within five business days of receipt. If the undersigned subcontractor receives notice that a sub-subcontractor has received an affidavit from any other contracted sub-subcontractor, the undersigned subcontractor must forward, within five business days of receipt, a copy of the notice to the contractor. Subcontractor hereby attests that its federal work authorization user identification number and date of authorization are as follows:

_____
Federal Work Authorization User Identification Number

_____
Date of Authorization

_____
Name of Subcontractor

_____
Name of Project

_____
Name of Public Employer

I hereby declare under penalty of perjury that the foregoing is true and correct.

Executed on _____, ___, 202__ in _____(city), _____(state).

_____
Signature of Authorized Officer or Agent

_____
Printed Name and Title of Authorized Officer or Agent

SUBSCRIBED AND SWORN BEFORE ME
ON THIS THE _____ DAY OF _____,202__.

_____
NOTARY PUBLIC
My Commission Expires:

_____

Sub-subcontractor Affidavit under O.C.G.A. §13-10-91(b)(4)

By executing this affidavit, the undersigned sub-subcontractor verifies it compliance with O.C.G.A. §13-10-91, stating affirmatively that the individual, firm or corporation which is engaged in the physical performance of services under a contract for (name of subcontractor or sub-subcontractor with whom such sub-subcontractor has privity of contract) and (name of contractor) on behalf of (name of public employer) has registered with, is authorized to use and uses the federal work authorization program commonly known as E-Verify, or any subsequent replacement program, in accordance with the applicable provisions and deadlines established in O.C.G.A. §13-10-91. Furthermore, the undersigned sub-subcontractor will continue to use the federal work authorization program throughout the contract period and the undersigned sub-subcontractor will contract for the physical performance of services in satisfaction of such contract only with sub-subcontractors who present an affidavit to the sub-subcontractor with the information required by O.C.G.A. §13-10-91(b). The undersigned sub-subcontractor shall submit, at the time of such contract, this affidavit to (name of subcontractor or sub-subcontractor with whom such sub-subcontractor has privity of contract). Additionally, the undersigned sub-subcontractor will forward notice of the receipt of any affidavit from a sub-subcontractor to (name of subcontractor or sub-subcontractor with whom such sub-subcontractor has privity of contract). Sub-subcontractors hereby attests that its federal work authorization user identification number and date of authorization are as follows:

_____
Federal Work Authorization User Identification Number

_____
Date of Authorization

_____
Name of Sub-Subcontractor

_____
Name of Project

_____
Name of Public Employer

I hereby declare under penalty of perjury that the foregoing is true and correct.

Executed on _____, ___, 202__ in _____(city), _____(state).

_____
Signature of Authorized Officer or Agent

_____
Printed Name and Title of Authorized Officer or Agent

SUBSCRIBED AND SWORN BEFORE ME
ON THIS THE _____ DAY OF _____,202__.

_____
NOTARY PUBLIC
My Commission Expires:_____

Affidavit Verifying Status for County Public Benefit Application

By executing this affidavit under oath, as an applicant for the award of a contract with Rockdale, County Georgia, I _____. [Name of natural person applying on behalf of individual, business, corporation, partnership, or other private entity] am stating the following as required by O.C.G.A. Section 50-36-1:

1) _____ I am a United States citizen

OR

2) _____ I am a legal permanent resident 18 years of age or older or I am an otherwise qualified alien or non-immigrant under the Federal Immigration and Nationality Act 18 years of age or older and lawfully present in the United States.*

In making the above representation under oath, I understand that any person who knowingly and willfully makes a false, fictitious, or fraudulent statement or representation in an affidavit shall be guilty of a violation of Code Section 16-10-20 of the Official Code of Georgia.

_____ _____
Signature of Applicant: Date

_____
Printed Name:

*_____
Alien Registration number for non-citizens

SUBSCRIBED AND SWORN
BEFORE ME ON THIS THE
_____ DAY OF _____, 202__.

_____
Notary Public
My commission Expires:

***Note**: O.C.G.A. § 50-36-1(e)(2) requires that aliens under the federal Immigration and Nationality Act, Title 8 U.S.C., as amended, provide their registration number. Because legal permanent residents are included in the federal definition of "alien", legal permanent residents must also provide their alien registration number. Qualified aliens that do not have an alien registration number may supply another identifying number below.

_____

BID BOND FORM

KNOW ALL MEN BY THESE PRESENTS, that we, _____ (hereinafter called the Principal) and _____ (hereinafter called the Surety), a corporation chartered and existing under the laws of the State of _____ with its principal offices in the City of _____and listed in the Federal Register and licensed to write surety bonds in the State of Georgia, are held and firmly bound unto Rockdale County, Georgia, in the full and just sum of _____Dollars ($_____) good and lawful money of the United States of America, to be paid upon demand of Rockdale County, Georgia, to which payment well and truly to be made we bind ourselves, our heirs, executors, administrators, and assigns, jointly and severally and firmly by these presents.

WHEREAS, the Principal is about to submit, or has submitted to Rockdale County, Georgia, a Bid for ITB No. ____-_____.

WHEREAS, the Principal desires to file this Bond in accordance with law to accompany this Bid.
NOW, THEREFORE, the conditions of this obligation are such that if the Bid be accepted within one hundred and twenty (120) days of the Bid opening, the Principal shall execute a Contract in accordance with the Bid and upon the terms, conditions, and prices set forth therein, and in the form and manner required by Rockdale County, Georgia, and within ten (10) days from the date of Notice of Award of the Contract, execute a sufficient and satisfactory Performance Bond equals to 100% of the Contract Price and Payment Bond equals to 100% of the Contract Price, payable to Rockdale County, Georgia, in form and with security satisfactory to Rockdale County and furnish satisfactory proof of the insurance required, then this obligation to be void; otherwise, to be and remain in full force and virtue in law; and the Surety shall, upon failure of the Principal to comply with any or all of the foregoing requirements within the time specified above, immediately pay to the aforesaid Rockdale County, Georgia, upon demand, the amount hereof in good and lawful money of the United States of America, not as a penalty, but as liquidated damages.

IN TESTIMONY THEREOF, the Principal and Surety have caused these presents to be duly signed and sealed this _____day of_____ , 202__ .

PRINCIPAL

By:_____(SEAL)
Signature of Principal

_____
Print Name and Title of Authorized Signer

_____
Print Name of Principal Business

ATTEST:

_____
Corporate Secretary

SURETY

By:_____(SEAL)
Signature of Surety (by Power of Attorney)

_____
Print Name and Title of Authorized Signer

_____
Print Name of Surety Business

WITNESS:

_____

Performance Bond

STATE OF GEORGIA BOND NO._____

COUNTY OF ROCKDALE

KNOW ALL MEN BY THESE PRESENTS, that we, _____,
as Principal, (hereinafter known as Contractor), and we, _____, as Surety, do hereby acknowledge ourselves indebted and firmly bound and held unto Rockdale County, Georgia for use and benefit of those entitled thereto, in the sum of_____
Dollars ($_____) for the payment of which will and truly to be made, in lawful money of the United States of America, we do hereby bind ourselves, successors, assigns, heirs and personal representatives.
BUT THE CONDITION OF THE FOREGOING OBLIGATION OR BOND IS THIS:
WHEREAS, the Owner has engaged the said Contractor for the sum of _____($_____) for construction of Rockdale County, Georgia, **ITB 22-___: Rebuild High Service Pumps 3 & 5** as more fully appears in a written Contract Agreement bearing the date of _____, 2022, a copy of which Contract Agreement is by reference hereby made a part hereof.
NOW, THEREFORE, if said Contractor shall fully and faithfully perform all the undertakings and obligations under the said Contract Agreement hereinbefore referred to and shall fully indemnify and save harmless the said Owner from all costs and damage whatsoever which it may suffer by reason of any failure on the part of said Contractor to do so, and shall fully reimburse and repay the said Owner any and all outlay and expense which it may incur in making good any such default, and shall correct all defects in products and workmanship appearing within one year of the completion of all Work, then this obligation shall be null and void, otherwise, it shall remain in full force and effect.
And for value received it is hereby stipulated and agreed that no change, extension of time, alteration or addition to the terms of the said Contract Agreement, or in the Work to be performed there under, or the Specifications accompanying the same shall in any wise affect the obligations under this Contract Agreement or Bond, and notice is hereby waived of any such damage, extension of time, alteration or addition to the terms of the Contract Agreement or to the Work or to the Contract Documents.
This bond is given pursuant to and in accordance with the provisions of O.C.G.A. Section 36-10-1 et. seq. and 36-82-100 et. seq. and all the provisions of the law referring to this character of Bond as set forth in said Sections or as may be hereinafter enacted, and these are hereby made a part hereof to the same extent as if set out herein in full.
IN WITNESS WHEREOF, the said Contractor has hereunder affixed its signature and seal, and said Surety has hereunto caused to be affixed its corporate signature and seal, by its duly authorized officers, on this ____ day of _____, 2022, executed in two (2) counterparts.

CONTRACTOR - PRINCIPAL:

By: _____

Name: _____
(Please Print)

Title: _____

Address:_____

Phone:_____

ATTEST:

Name: _____
(Please Print)
Title: _____ (SEAL)

Note: Attestation for a corporation must be by the corporate secretary; for a partnership by another partner; for an individual by a notary.

SURETY:
By: _____

Name: _____
(Please Print)
Title: _____ (SEAL)

WITNESS:

Name: _____
(Please Print)
Title: _____ (SEAL)

Note: Surety companies executing bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the Project is located.

Resident agent in state in which Work is to be performed:

By: _____

Name: _____
(Please Print)
Title: _____

Address:_____

Phone:_____

Payment Bond

STATE OF GEORGIA BOND NO._____

COUNTY OF ROCKDALE

KNOW ALL MEN BY THESE PRESENTS, that we, _____, as Principal, (hereinafter known as Contractor), and we, _____, as Surety, are held and firmly bound unto Rockdale County, Georgia (hereinafter called the Owner), in the penal sum of _____ Dollars ($_____) lawful money of the United States of America, for the payment of which sum will and truly to be made, we bind ourselves, our heirs, personal representatives, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, said Contractor has entered into a certain Contract Agreement with said Owner, dated_____ _____, 2022, for construction of Rockdale County, Georgia **ITB 22-___: Rebuild High Service Pumps 3 & 5** (hereinafter called the Contract), which Contract Agreement and the Contract Documents for said Work shall be deemed a part hereof as fully as if set out herein.

NOW, THEREFORE, the condition of this obligation is such, that if said Contractor and all subcontractors to whom any portion of the Work provided for in said Contract Agreement is sublet and all assignees of said Contractor and of such subcontractors shall promptly make payments to all persons supplying them with labor, products, services, or supplies for or in the prosecution of the Work provided for in such Contract Agreement, or in any amendment or extension of or addition to said Contract Agreement, and for the payment of reasonable attorney's fees, incurred by the claimant in suits on this Bond, then the above obligation shall be void; otherwise, it shall remain in full force and effect.

HOWEVER, this Bond is subject to the following conditions and limitations:

(a) Any person, firm or corporation that has furnished labor, products, or supplies for or in the prosecution of the Work provided for in said Contract Agreement shall have a direct right of action against the Contractor and Surety on this Bond, which right of action shall be asserted in a proceeding, instituted in the county in which the Work provided for in said Contract Agreement is to be performed or in any county in which Contractor or Surety does business. Such right of action shall be asserted in proceedings instituted in the name of the claimant or claimants for its use and benefit against said Contractor and Surety or either party (but not later than one year after the final settlement of said Contract Agreement) in which action such claim or claims shall be adjudicated, and judgment rendered thereon.

(b) In no event shall the Surety be liable for a greater sum than the penalty of this Bond, or subject to any suit, action or proceeding thereon that is instituted later than one year after the final settlement of said Contract Agreement.

(c) This Bond is given pursuant to and in accordance with provisions of O.C.G.A. Section 13-10-1 et. seq. and 36-82-100 et. seq. hereinafter, and all the provisions of law referring to this character of Bond as set forth in said Sections or as may be hereinafter enacted, and these are hereby made a part hereof to the same extent as if set out herein in full.

IN WITNESS WHEREOF, the said Contractor has hereunder affixed its signature and seal, and said Surety has hereunto caused to be affixed its corporate signature and seal, by its duly authorized officers, on this ___ day of _____, 2022, executed in two (2) counterparts.

CONTRACTOR - PRINCIPAL:

By: _____

Name: _____
(Please Print)

Title: _____

Address:_____

Phone:_____

ATTEST:

Name: _____
(Please Print)

Title: _____ (SEAL)

Note: Attestation for a corporation must be by the corporate secretary; for a partnership by another partner; for an individual by a notary.

SURETY:

By: _____

Name: _____
(Please Print)

Title: _____ (SEAL)

WITNESS:

Name: _____
(Please Print)

Title: _____ (SEAL)

Note: Surety companies executing bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the Project is located.

Resident agent in state in which Work is to be performed:

By: _____

Name: _____

(Please Print)

Title: _____

Address: _____

Phone: _____

CONTRACTOR'S QUALIFICATION STATEMENT AND QUESTIONNAIRE
USE THIS FORM AS NEEDED PER ITB scope of work

NAME OF PROPOSED CONTRACTOR: _____

I. INSTRUCTIONS

A. All questions are to be answered in full. If copies of other documents will answer the question completely, they may be attached and clearly labeled. If additional space is needed, additional pages may be attached and clearly labeled.

B. The owner, Rockdale County, Georgia, its agents and representatives, shall be entitled to contact each and every reference listed in response to this questionnaire, and each entity referenced in any response to any question in this questionnaire. By completing this questionnaire, the contractor expressly agrees that any information concerning the contractor in possession of said entities and references may be made available to the owner.

C. Only complete and accurate information shall be provided by the contractor. The contractor hereby warrants that, to the best of its knowledge and belief, the responses contained herein are true, accurate, and complete. The contractor also acknowledges that the owner is relying on the truth and accuracy of the responses contained herein. If it is later discovered that any material information given in response to a question was provided by the contractor, knowing it was false, it shall constitute grounds for immediate termination or rescission by the owner of any subsequent agreement between the owner and the contractor. The owner shall also have and retain any other remedies provided by law.

D. The completed form shall be submitted with contractor's proposals.

E. This form, its completion by the contractor, and its use by the contractor, and its use by the owner, shall not give rise to any liability on the part of the owner to the contractor or any third party or person.

II. GENERAL BACKGROUND

A. Current address of contractor: _____
_____

B. Previous Name or address of contractor: _____
_____

C. Current president or CEO and years in position: _____

D. Number of permanent employees: _____

E. Name and address of affiliated companies: _____
_____

III. FINANCIAL STATUS

A. Please attach financial statements for the past three years for which they are complete. If such statements are not available, please furnish the following information:

1. LAST COMPLETE FISCAL YEAR:

A.	Revenues (Gross)	_____
B.	Expenditures (Gross)	_____
C.	Overhead & Admin (Gross)	_____
D.	Profit (Gross)	_____

2. YEAR PRIOR TO "1" ABOVE:

A.	Revenues (Gross)	_____
B.	Expenditures (Gross)	_____
C.	Overhead & Admin (Gross)	_____
D.	Profit (Gross)	_____

3. YEAR PRIOR TO "2" ABOVE:

A.	Revenues (Gross)	_____
B.	Expenditures (Gross)	_____
C.	Overhead & Admin (Gross)	_____
D.	Profit (Gross)	_____

B. BANKRUPTCIES

1. Has the Contractor, or any of its parents or subsidiaries, ever had a Bankruptcy Petition filed in its name, voluntarily or involuntarily? (If yes, specify date, circumstances, and resolution).

_____

_____

2. Has any Majority Shareholder ever had a Bankruptcy Petition filed in his/her name, voluntarily or involuntarily? (If yes, specify date, circumstances, and resolution).

_____

_____

C. BONDING

1. What is the Contractor's current bonding capacity? _____

2. What is the value of the Contractor's work currently under contract? _____

IV. COMPANY EXPERIENCE – SIMILAR PROJECTS

A. List three projects of reasonably similar nature, scope, and duration performed by your company in the

last five years, specifying, where possible, the name and last known address of each owner of those projects:

Reference/Project #1:
Name and Address: _____

Date of Construction/Project: _____

Type of Construction/Project: _____

Contract Price: _____

Owner contact info: _____

Architect/Engineer contact info: _____
(if applicable)

Reference/Project #2:
Name and Address: _____

Date of Construction/Project: _____

Type of Construction/Project: _____

Contract Price: _____

Owner contact info: _____

Architect/Engineer contact info: _____
(if applicable)

Reference/Project #3:
Name and Address: _____

Date of Construction/Project: _____

Type of Construction/Project: _____

Contract Price: _____

Owner contact info: _____
_____
_____

Architect/Engineer contact info: _____
(if applicable) _____
_____

V. ARBITRATIONS, LITIGATIONS, AND OTHER PROCEEDINGS

Has your company been involved in any construction arbitration demands filed by, or against, you in the last five years? _____

Has your company been involved in any construction-related lawsuits (other than labor or personal injury litigation) filed by, or against, you in the last five years? _____

Has your company been involved in any lawsuits, proceedings, or hearings initiated by the National Labor Relations Board or similar state agency in the past seven years? _____

Has your company been involved in any lawsuits, proceedings, or hearings initiated by the Occupational Safety and Health Administration concerning the project safety practices of the Contractor in the last seven years? _____

Has your company be involved in any lawsuits, proceedings, or hearings initiated by the Internal Revenue Service, or any state revenue department, concerning the tax liability of the Contractor (other than audits) in the last seven years? _____

Have any criminal proceedings or investigations been brought against the Contractor in the last ten years? _____

If you answered yes to any of the questions above, please identify the nature of the claim, the amount in dispute, the parties, and the ultimate resolution of the proceeding (attach documentation if needed):

_____
_____
_____
_____

VI. COMMENTS

Please list any additional information that you believe would assist the Owner in evaluating the possibility of using the Contractor on this Project. You may attach such additional information as an Exhibit to this Statement and Questionnaire.

_____

_____

_____

_____

I certify to the Owner that the information and responses provided on this Questionnaire are true, accurate and complete. The Owner, or its designated representative, may contact any entity or reference listed in this Questionnaire. Each entity or reference may make any information concerning the Contractor available to the Owner, or its designated representative.

Contractor:

_____ _____

Signature Date

_____

Title

Sworn to and subscribed before me
This _____ day of _____

_____

Signature

Notary Public

My Commission Expires:

SAMPLE CONTRACT
(PAGE 1 OF 5)

CONTRACT AGREEMENT FOR THE REBUILD OF HIGH SERVICE PUMPS AND MOTORS FOR #3 & #5

This Contract Agreement made and entered into on the _____ day of _____, 2022 by and between Rockdale County, Georgia, a political subdivision of the State of Georgia, 962 Milstead Avenue, Conyers, Georgia 30012 (hereinafter called the "Owner" or "County"), and _____, a _____ whose address is _____, (hereinafter called the "Contractor"); and

WHEREAS, the County desires to engage the services of Contractor to perform the removal/installation of Rebuild High Service Pumps 3 & 5; and

WHEREAS, Contractor is qualified to perform this service and desires to render year round lawn maintenance services to the County as provided herein.

NOW THEREFORE, the County engages the services of Contractor for and in consideration of the mutual promises contained in this Agreement and the parties agree as follows:

1. **SCOPE OF WORK.** Contractor shall furnish all products, tools, equipment, skill and labor of every description necessary to carry out and to complete in a good firm, substantial workmanlike matter for the removal/installation of Rebuild High Service Pumps 3 & 5 for Rockdale County (hereinafter "Work"), and in accordance with the County's Invitation to Bid (ITB) No. 22-_____, and all addenda, incorporated herein by reference, (hereinafter "Work"), and as described in Contractor's bid dated _____, attached hereto and made a part hereof, and hereinafter referred to as the "Services". Contractor shall provide, at their expense, all vehicles, supplies, and equipment necessary to provide these Services. These Services shall be performed at the direction of the Director of the Water Resources Department or his designee and consistent with all federal, state, and local laws.

The Contract Documents, Invitation to Bid, and Bid are considered essential parts of the Contract, and requirements occurring in one are as binding as though occurring in all. They are intended to define, describe, and provide for all labor necessary to complete the Work in an acceptable manner by the County.

The Contractor shall commence the Work to be performed under this Contract Agreement on a date to be specified in a written Notice to Proceed and shall fully complete all work hereunder within _____ (**to be determined**) days.

Time is of the essence and is an essential element of this Contract, and the Contractor shall pay to the Owner, not as a penalty, but as liquidated damages, the sum of $100.00 for each calendar day that there is default of completing the Work within the time limit named herein. If the Contractor abandons the Contract before commencement of the Work or defaults in completion of all the Work after commencement thereof, the Contractor shall be liable for such liquidated damages. These fixed liquidated damages are not established as a penalty but are calculated and agreed upon in advance by the Owner and the Contractor due to the uncertainty and impossibility of making a determination as to the actual and consequential damages incurred by the Owner and the general public of Rockdale County, Georgia as a result of the failure on the part of the Contractor to complete the Work on time. Such liquidated damages referred to herein are intended to be and are cumulative and shall be in addition to every other remedy now or hereafter enforceable at law, in equity, by statute, or under the Contract.

SAMPLE CONTRACT
(PAGE 2 OF 5)

2. PAYMENT. The County hereby agrees to pay to the Contractor for the faithful performance of this Contract Agreement, subject to additions and deductions as provided in the Specifications and Bid, in lawful money of the United States a sum of _____Dollars ($_____) plus ten percent (10%) contingency of _____Dollars ($_____for a **TOTAL of** _____**Dollars ($_____)** which sum shall also pay for loss or damage arising out of the nature of the Work aforesaid, or from the action of the elements, or from unforeseen obstructions or difficulties encountered in the prosecution of the Work, and for all expenses incurred by, or in consequence of the Work, its suspension or discontinuance and for well and faithfully completing the Work and the whole thereof, as herein provided, and for replacing defective work or products for a period of one year after completion.

The Owner shall make monthly partial payments to the Contractor in accordance with the provisions of the Contract Documents. Contractor shall submit monthly invoices to the County in a format acceptable to the County that includes accurate and current information.

Payment Requests and original invoice(s) must be submitted to:

Rockdale County Finance Department
P.O. Box 289
Conyers, GA 30012
Include Contract No. 2022-_____

Payment is to be made no later than thirty (30) days after submittal of undisputed invoice.

Final payment on account of this Contract Agreement shall be made within thirty (30) days after the completion by the Contractor of all work covered by this Contract Agreement and Final Acceptance of such Work by the Owner, in accordance with the provisions of the Contract Documents.

3. PERFORMANCE OF SERVICES. The manner in which the services are to be performed, shall be determined by Contractor. The County will rely on Contractor to work as many hours as may be necessary to fulfill Contractor's obligations under this Agreement for the fee provided in Section 2 of this Agreement.

4. DEFAULT AND TERMINATION. Failure to substantially perform the Services or fulfill obligations set forth hereunder shall constitute material default. Where either party believes there is a material default by the other party, the party claiming such default shall give written notice of the default to the other party within fifteen (15) days. The defaulting party shall have ten (10) days in which to correct or cure the default, provided, however, that such default shall be cured within fifteen (15) days unless otherwise agreed upon by the parties.
Should either party materially default in the performance of any provision of this Agreement and fail to cure such default as provided herein, the other party shall be permitted to terminate this Agreement with fifteen (15) days written notice to the other party hereto. Termination of this Agreement shall not constitute waiver of any other remedy either party may have hereunder.

SAMPLE CONTRACT
(PAGE 3 OF 5)

5. TERMINATION.
Either party, upon giving thirty (30) days written notice, may terminate this Agreement at any time without cause. Termination of this Agreement by either party shall not impair or affect whatever rights, including payment for services performed prior to termination either party may have under this Agreement.

Upon such termination, Contractor shall be entitled to collect only the outstanding fees incurred based upon the work completed as the day of termination. In the event of termination, Contractor shall submit a final billing through the date of termination and if accepted by the County, payment shall be made within thirty (30) days of receipt thereof.

6. RELATIONSHIP OF PARTIES. It is understood by the parties that Contractor is an independent contractor with respect to the County and not an employee of the County.

7. INDEMNIFICATION. Contractor agrees to hold harmless and indemnify County, its Directors, Officers, and employees from and against any and all liability, claims, actions, causes of action, losses, damages, demands, suits, judgments, costs and expenses arising out of bodily injury (including death) to persons or damage to property, including, but not limited to, any and all costs, expenses, legal fees and liabilities, incurred in and about investigation and defense thereof, to the extent caused by a negligent act, error or omission of Contractor, or as a result of defective services under this Agreement.

8. ASSIGNMENT. The Contractor's obligations under this Agreement may not be assigned or transferred to any other person, firm, or corporation without the prior written consent of the County.

9. NOTICES. All notices required or permitted under this Agreement shall be in writing and shall be deemed delivered when delivered in person or deposited in the United States mail, postage prepaid, addressed as follows:

IF for the County:

Rockdale County Board of Commissioners
Attn: Tina Malone, Purchasing and Procurement Manager
958 Milstead Avenue, Suite 300
Conyers, Georgia 30012
770-278-7552
tina.malone@rockdalecountyga.gov

IF for Contractor:
Vendor Name & Address
Attn: _____
_____
_____
Phone -
Email -

SAMPLE CONTRACT
(PAGE 4 OF 5)

10. ENTIRE AGREEMENT. This Agreement, its attachments, and essential documents (as provided in paragraph 1 above) represent the entire understanding of the parties with regard to the subject matter of this Agreement. There are no oral agreements, understandings, or representations made by any party to this Agreement that are outside of this Agreement and are not expressly stated in it. No supplement, modification, or amendment of this Agreement will be binding unless executed in writing by all parties.
By signing this Agreement, the parties acknowledge that they have read each and every page of this Agreement before signing same and that they understand and assent to all the terms thereof. In addition, by signing this Agreement, the parties acknowledge that they are entering into this Agreement freely and voluntarily and under no compulsion or duress.

11. CORPORATE AUTHORITY. Contractor represents to the County that this Agreement, the transaction contemplated in this Agreement, and the execution and delivery hereof, have been duly authorized by all necessary corporate proceedings and actions, including, without limitation, the action on the part of the directors. The individual executing this Agreement on behalf of Contractor warrants that he or she is authorized to do so and that this Agreement constitutes the legally binding obligation of the corporation.

12. AMENDMENT. This Agreement may be modified or amended if the amendment is made in writing and is signed by both parties.

13. SEVERABILITY. If any provisions of this Agreement shall be held to be invalid or unenforceable for any reason, the remaining provisions shall continue to be valid and enforceable. If a court finds that any provisions of this Agreement is invalid or unenforceable, but that by limiting such provision it would become valid and enforceable, then such provision shall be deemed to be written, construed, and enforced as so limited.

14. WAIVER OR CONTRACTUAL RIGHT. The failure of either party to enforce any provisions of this Agreement shall not be construed as a waiver or limitation of that party's right to subsequently enforce and compel strict compliance with every provision of this Agreement.

15. FURTHER ASSURANCES. The Contractor agrees to execute, acknowledge, seal and deliver, after the date of this Agreement, without additional consideration, such further assurances, instruments and documents, and to take such further actions, as the County may reasonably request in order to fulfill the intent of this Agreement and the transactions contemplated by this Agreement.

16. INTERPRETATION. Should any provision of this Agreement require a judicial interpretation, the parties agree that the body interpreting or construing this Agreement will not apply the assumption that the terms of this Agreement will be more strictly construed against one party by reason of the rule of legal construction that an instrument is to be construed more strictly against the party which itself or through its agents prepared the Agreement. The parties acknowledge and agree that they and their agents have each participated equally in the negotiation and preparation of this Agreement.

17. VENUE & JURISDICTION. The County and the Contractor, by entering into this Agreement, hereby agree that the courts of Rockdale County, Georgia shall have jurisdiction to hear and determine any claims or disputes between them pertaining directly or indirectly to this Agreement. Contractor expressly submits and consents in advance to such jurisdiction in any action or proceeding commenced in said courts. The choice of forum set forth in this section shall not be deemed to preclude the bringing of any action by the County or the enforcement by the County of any judgment obtained in such forum in any other appropriate jurisdiction. Further, the Contractor hereby waives the right to assert the defense of forum non-conveniens and the right to challenge the venue of any court proceeding.

SAMPLE CONTRACT
(PAGE 5 OF 5)

18. INSURANCE AND BONDS. The Contractor shall not commence any work under this Contract until all insurance and bonds, as stipulated in the invitation to bid, have been obtained and such insurance and bonds have been approved by the County, nor shall the Contractor allow any subcontractor to commence any work on subcontractor's contract until all similar insurance and bonds required of the subcontractor have been so obtained and approved by the Contractor.
It is further mutually agreed between the parties hereto that if, at any time after the execution of this Contract Agreement and the surety bonds hereto attached for its faithful performance, the Owner shall deem the surety or sureties upon such bond to be unsatisfactory, or if, for any reason, such bond ceases to be adequate to cover the performance of the Work, the Contractor shall, at no additional expense to Owner, within five days after the receipt of notice from the Owner to do so, furnish an additional bond or bonds in such form and amount, and with such surety or sureties as shall be satisfactory to the Owner. In such event, no further payment to the Contractor shall be deemed to be due under this Contract Agreement until such new or additional security for the faithful performance of the Work shall be furnished in manner and form satisfactory to the Owner.

19. APPLICABLE LAW. This Agreement shall be construed and interpreted according to the provisions of the laws of the State of Georgia.

20. COUNTERPARTS. This Agreement and any change orders may be executed in one or more counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same instrument. For purposes of executing this Agreement and any change orders, scanned signatures shall be as valid as the original.

IN WITNESS WHEREOF, the parties have hereunto set their hands and seals on the date and year first above written.

VENDOR NAME

By: _____

_____
Name (Typed or Printed) & Title

_____
Federal Tax I.D. Number

Witness:

_____

ROCKDALE COUNTY, GEORGIA

By: _____
Osborn Nesbitt, Sr., Chairman

Attest:

_____
Jennifer Rutledge, Executive Director/County Clerk

Approved as to form:

_____
M. Qader A. Baig, County Attorney

SUBCONTRACTORS

Instructions: Type or clearly print all information.

NAME, ADDRESS, & PHONE NUMBER OF SUBCONTRACTOR	SUBCONTRACT WORK ITEM	DOLLAR VALUE OF SUBCONTRACT WORK
1.		
2.		
3.		
4.		
5.		
6.		

Representative's Signature: _____ Date: _____

BIDDER'S CHECKLIST

_____ **Bid Bond in the Amount of 5% of the Total Bid Amount**
Note: Performance Bond, Payment Bond, and Proof of Insurance coverage are required after contract award.

_____ **THREE (3) HARDCOPIES (one (1) original, two (2) photocopies) and ONE (1) FLASH DRIVE (containing a copy in Adobe PDF format) of the following documents: all documents shall be fully completed, signed, and dated:**

- _____ **Bid Form (See Page 14)**
- _____ **All Applicable Affidavit Forms (See Pages 15 - 20)**
- _____ **Contractor's Qualification Statement and Questionnaire (See Pages 28 - 32)**
- _____ **Subcontractors (See Page 38)**
- _____ **Any Proposed Deviations from the Required Specifications, Including Necessary Explanations and Conditions**
- _____ **Proof of Business License**
- _____ **Proof of Georgia General Contractor and/or Utility Contractor License**

***The purpose of this checklist is to remind bidders of the documents generally required for the bid submittal. It is the bidder's responsibility to include additional documents requested in the bid that may not be shown on the checklist.**

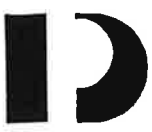
Worthington

Centrifugal Pumps

Instruction, Operation, and Maintenance Manual

Type LNN, LNNV and LNNC

***Use of non-Worthington (Ingersoll-Dresser Pump) parts will void the Manufacturer's warranty.**



INGERSOLL-DRESSER PUMP COMPANY

LNN.IM (FEB97)

REF C953KH001

Centrifugal Pumps
Type LNN/LNNV/LNNC

1 FOREWORD

1.1 Worthington products are the result of more than a century of progressive study and development. Advanced design, proper selections of material, and precision construction reflect this wide experience.

Worthington products will give trouble free efficient operation with minimum maintenance and repair. This instruction book will familiarize management and operating personnel with pertinent details and procedures for the installation, operation, and maintenance of these pumps.

The spaces below are for your identification of the equipment for which this book applies.

Unit Size	Bearing Frame	Serial No.	Identification No.

WARNING

These pumps (or a prototype) have been shop tested and found satisfactory for the condition for which they were sold.

DO NOT operate these pumps in excess of their rated capacity, speed, pressure, and temperature.

Operate only in accordance with the instructions contained in this manual. To do otherwise may subject the pumps to stresses and strains they were not designed to withstand. Failure to heed this warning may result in an accident causing personal injury.

1.2 STUDY THIS INSTRUCTION BOOK

1.2.1 The description and instructions contained in this book cover the standard equipment design and many common variations. This book does not cover all design details and variations nor does it provide for every possible contingency which may be encountered. When information cannot be found in this book, contact the nearest Ingersoll-Dresser Pump (Worthington) Sales Representative.

2 SAFETY

2.1 Duty Conditions

2.1.1 This pump has been selected to meet the duty and service conditions advised on your order. The acknowledgement of these conditions has been sent separately to the Purchaser. A copy should be kept with this manual.

2.1.2 If there is any doubt as to the suitability of the pump for the application intended, contact Ingersoll-Dresser Pumps for advice, quoting the pump serial number.

2.2. Safety Action

2.2.1 THIS IS A SUMMARY OF CONDITIONS AND ACTIONS TO PREVENT INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT.

2.2.2 PREVENT EXCESSIVE EXTERNAL PIPE LOAD.

Do not use pump as a support for piping. Do not mount expansion joints so that their force, due to internal pressure, acts on the pump flange.

2.2.3 START THE PUMP WITH OUTLET VALVE CLOSED.

This is recommended to avoid the risk of overloading and damaging the pump motor at full flow. Pumps may be started with the valve open only on installations where this situation cannot occur.

2.2.4 ENSURE CORRECT LUBRICATION (See section - "Making ready for operation - Lubrication")

2.2.5 NEVER RUN THE PUMP DRY

2.2.5.1 INLET VALVES TO BE FULLY OPEN WHEN PUMP IS RUNNING.

Running the pump at zero flow or below the recommended minimum flow continuously will cause the shaft, packing or mechanical seal to run hot and fail within a short time.

2.2.6 DO NOT RUN THE PUMP AT ABNORMALLY HIGH OR LOW FLOW RATES

Operating at a flow rate higher than normal or at a flow rate with no back pressure on the pump may overload the motor and cause cavitation. Low flow rates may cause a reduction in pump/bearing life, overheating of the pump, instability and cavitation/vibration.

2.2.7 NEVER DO MAINTENANCE WORK WHILE THE UNIT IS CONNECTED TO POWER.

NEVER APPLY HEAT TO REMOVE IMPELLER. Trapped lubricant or vapor could cause an explosion.

2.2.9 DRAIN PUMP AND ISOLATE PIPE WORK BEFORE DISMANTLING THE PUMP.

The appropriate safety precautions should be taken where the pumped liquids are hazardous.

2.2.10 FLOURO-ELASTOMERS

When a pump has experienced temperatures over 250°C, partial decomposition of flouro-elastomers, e.g. viton, will occur. In this condition these are extremely dangerous and skin contact must be avoided.

2.2.11 THERMAL SHOCK

Rapid changes in the temperature of the liquid within the pump can cause thermal shock, which can result in damage or breakage of components. Thermal shock should be avoided, particularly so, where the material of the pump is not resistant to such loading.

2.2.12 HOT (and cold) PARTS

When the pumped products are hot, require auxiliary heating supplies, or are below freezing, the site installation shall be designed to prevent accidental contact with the hot (or cold) parts and pipe work. Note that drive motors may also become hot during operation.

2.2.13 HAZARDOUS LIQUIDS

When the pump is handling hazardous liquids care must be taken to avoid liquid contact using the appropriate health and safety procedures. Pump location and personnel access/training should be consider and address these site dangers.

3 TABLE OF CONTENTS

4. PUMP TECHNICAL DATA

4.1 Performance

4.1.1 For performance parameters see the paragraph on 'Safety-Duty conditions'. When specified by the Contract, performance data has been supplied separately to the purchaser and should be obtained and retained with this manual if required.

4.2 Noise Level

4.2.1 When pump noise level exceeds 85 dBA attention must be given to prevailing Health and Safety Regulation, to limit the exposure of plant operating personnel to the noise. The usual approach is to control exposure time to the noise or to enclose the machine to reduce emitted sound.

You may have already specified a limiting noise level when the equipment was ordered, however, if no noise requirements were defined then machines above a certain power level will exceed 85 dBA.

Pump noise level is dependent on a number of factors:- the type of motor used, the pumps operating capacity, pipe work design, and acoustic characteristics of the building.

4.3 Pressure Limits

4.3.1 The operating pressure has been selected to meet your specified requirements. See the paragraph on 'Safety-Duty Conditions' for details.

4.3.2 The pressure and temperature operating limits for the flanges are in accordance with the relevant National or International standards unless advised otherwise.

4.4 Pump Lubricants

4.4.1 RECOMMENDED OIL LUBRICANTS

The recommended oil for a splash lubrication system (constant level oiler) should have a viscosity of 61-75 mm^2/s, a pour point of -12°C and have an ISO VG 68. The recommended oil for a force feed lubrication system should have a viscosity of 44-61 mm^2/s, a pour point of -15°C and have an ISO VG 48. Suggested Companies and their Lubricant Types are listed below.

MANUFACTURER	SPLASH LUBRICANT	FORCE FEED LUBRICANT
CHEVRON	AW Machine Oil 68 or GST Oil 68	AW Machine Oil 48 or GST Oil 48
AMOCO	RYKON 68 or American Industrial 68	RYKON 48 or American Industrial 48
EXXON	TERESSTIC 68 or NUTO H 68	TERESSTIC 48 or NUTO H 48
MOBIL	DTE OIL Heavy Medium or DTE 26	DTE OIL Medium or DTE 25
TEXACO	Rando Oil HD 68 or Regal R&O 68	Rando HD 48 or Regal R&O 48
SHELL	Turbo T 68	Turbo T 48

Oil lubricated pump bearings **ARE NOT** filled with factory lubricant prior to shipment. Oil of the proper type **MUST** be added by the User prior to operating the equipment.

4.4.2. RECOMMENDED GREASE LUBRICANTS

The recommended grease for a grease lubricated system should have an NLGI 2 suitable for a temperature range of -20 to 120°C. Suggested Companies and their Lubricant Types are listed below.

MANUFACTURER	LUBRICANT
CHEVRON	DURA-LITH EP2
AMOCO	AMOLITH 2 or AMOLITH EP2
EXXON	BEACON Q2 OR LIDOK EP2
MOBIL	Mobilux 2
TEXACO	Premium RB, Regal AFB 2 or Multifak EP2
SHELL	ALVANIA 2 or EP2

If pump bearings are grease lubricated they are factory packed prior to shipment.

4.5 Recommended screw torques

The recommended torque values for all pump assembly fasteners (Metric), except fasteners for LNNV feet attachments, are as follows:

Screw size	Torque Lb-Ft (Nm)
M8	7 (10)
M10	15 (20)
M12	26 (35)
M16	68 (93)
M20	132 (180)
M24	228 (310)
M27	300 (410)
M30	435 (590)
M36	720 (980)
M42	1125 (1530)
M48	1650 (2240)

The recommended torque values for all support structure fasteners (Metric) to LNNV feet attachment points are as follows:

Details for LNNV Feet only	
Screw size	Torque Lb-Ft (Nm)
M16	125 (170)
M20	250 (340)
M24	435 (590)
M27	570 (770)
M30	810 (1100)
M36	1350 (1840)

The recommended torque values for all motor and pump to baseplate (SAE) fasteners are as follows:

Screw size	Torque Lb-Ft (Nm)
1/2"	50 (70)
5/8"	100 (135)
3/4"	175 (235)
7/8"	150 (205)
1"	225 (305)
1 1/8"	320 (435)
1 1/4"	450 (610)
1 3/8"	590 (800)
1 1/2"	790 (1070)

4.6 Flange Loads

4.6.1 When requested the permissible flange loading will have been supplied separately to the purchaser and should be obtained and retained with this manual. If in doubt contact IDP for information.

4.7 Temperature Limits

4.7.1 Maximum operating temperature with standard stuffing box is 80 degrees C.

4.7.2 Ambient Temperature

These pumps are generally fitted with TEFC motors with an ambient temperature limit of 40°C. Specific pumps may be fitted with motors to suit clients requirements with other ambient temperature limits - see motor nameplate for details.

4.8 Wearing Clearances

Pump Size	Minimum Passage Size, inch	Nominal Wear Ring Diameter, inch	Mean Radial Wear Ring Clearance, inch
200LNN300	.88	8.46	.012
200LNN325	.96	9.45	.012
200LNN375	1.00	8.46	.012
200LNN400	1.16	9.45	.012
200LNN475	.94	9.45	.012
200LNN500	.69	8.46	.012
200LNN600	.63	9.45	.012
250LNN325	1.19	9.45	.012
250LNN375	1.09	10.39	.012
250LNN475	1.28	10.39	.012
250LNN600	.87	10.39	.012
300LNN475	1.43	12.99	.012
300LNN500	1.45	11.81	.012
300LNN575	1.69	13.78	.012
300LNN600	1.18	11.81	.012
300LNN750	1.10	12.99	.012
350LNN475	1.79	14.96	.012
350LNN575	1.62	14.96	.012
350LNN725	1.89	14.96	.012
350LNN900	1.30	14.96	.012
400LNN600	1.78	16.54	.012
400LNN725	2.14	16.54	.012
400LNN900	1.78	17.32	.012
500LNN650	2.38	18.50	.012
500LNN700	1.92	17.32	.012
500LNN775	2.15	19.69	.012
500LNN950	2.52	19.69	.012
500LNN1150	1.65	19.69	.012
600LNN950	2.66	24.41	.016
600LNN975	2.84	22.20	.016
600LNN1200	2.37	22.83	.016
700LNN1225	3.52	27.56	.016
300LNNC475	1.43	12.99	.012
300LNNC500	1.45	11.81	.012
300LNNC575	1.69	13.78	.012
350LNNC475	1.79	13.78	.012
350LNNC575	1.62	14.96	.012
350LNNC725	1.89	14.96	.012
350LNNC900	1.30	14.96	.012
600LNNC950	2.66	24.41	.016
600LNNC975	2.84	22.20	.016
700LNNC1225	3.52	27.56	.016

5 PRODUCT DESCRIPTION

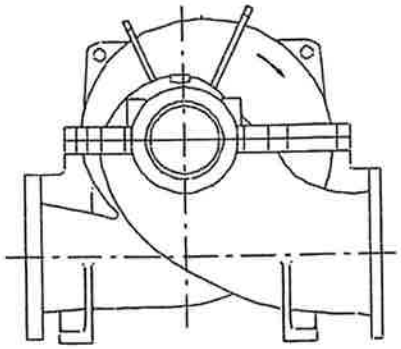
5.1 General

5.1.1 This pump has the casing joint axial to the shaft allowing maintenance to the rotating element by removing the top half casing.

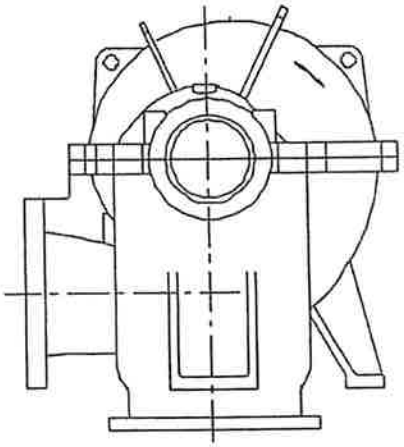
5.2 Pump casing

5.2.1 The axially split casing has branches in the lower half enabling access to rotating element by removing top half casing.

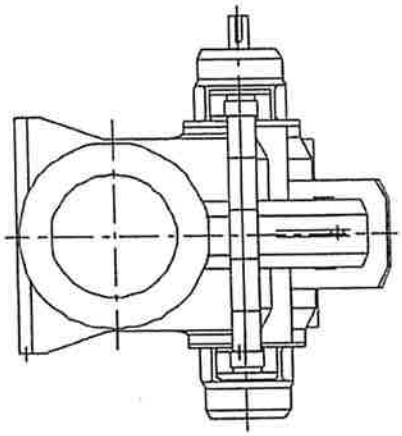
5.2.2 The following casing configurations are available,



LNN
Horizontal inlet and outlet nozzles



LNNC
Bottom vertical inlet, horizontal outlet.



LNNV
Horizontal inlet/outlet, vertical shaft.

5.3 Impeller

5.3.1 A shrouded impeller with hub rings is fitted.

5.4 Shaft

5.4.1 The large diameter stiff shaft, mounted on bearings, has a keyed drive end.

5.5 Bearing Housing

5.5.1 Two grease nipples enable grease lubricated bearings to be replenished between major service intervals.

5.5.2 For oil lubricated bearings, a constant level oiler is fitted.

5.6 Pump Bearings and Lubrication

5.6.1 The standard LNN and LNNC bearings may be oil or grease lubricated. The standard LNNV bearings are grease lubricated.

5.6.2 An optional product lubricated lower bearing may be used on the LNNV.

5.6.3 The lower LNNV journal bearings may be lubricated by product or from an external source.

5.7 Seal Housing

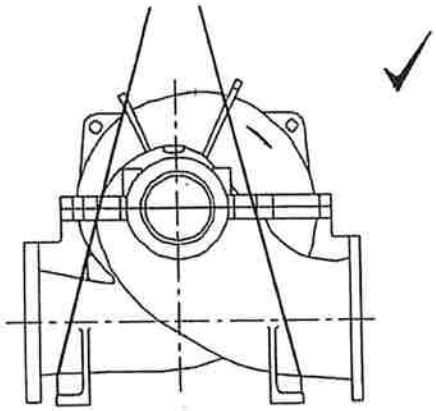
5.7.1 The seal housing has spigots between the pump casing and bearing housing for optimum concentricity.

5.7.2 The design enables one of a number of sealing options to be fitted.

5.8 Shaft Seal

5.8.1 The standard stuffing box is fitted with packing and an adjustable gland assembly.

5.8.2 Optional mechanical seal(s), attached to the shaft sleeves, may be used to seal the pumped liquid from the environment.



5.9 Driver

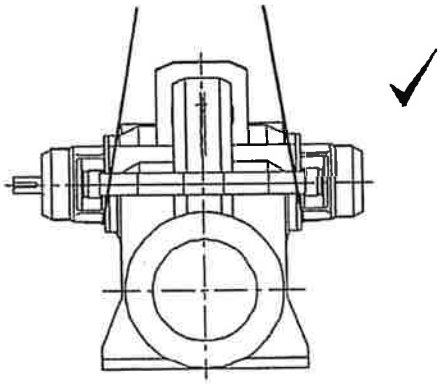
5.9.1 The DRIVER is normally an electric motor. Different drive configurations may be fitted such as an internal combustion engine, turbines, hydraulic motors, etc. driving via couplings, belts, gearboxes, drive shafts, etc.

5.10 Accessories

5.10.1 Accessories may be fitted when specified by the customer.

6 STORAGE

6.1 Store the pump in a clean, dry location away from vibration. Leave piping connection covers in place to keep dirt and other foreign material out of pump casing. Turn pump at intervals to prevent brinelling of the bearings and the seal faces, if fitted, from sticking.



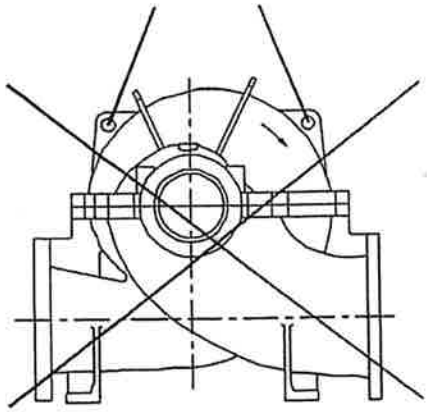
6.2 The pump may be stored as above for up to 6 months. Consult IDP for preservative actions when a longer storage period is needed.

6.3 Warranty for the pumps will normally be for 12 months. Extension of this period can only be achieved with the prior agreement of Ingersoll-Dresser Pumps and would necessitate inspection, prior to putting the pump into service.

7 INSTALLATION

7.1 Unpacking and Inspection

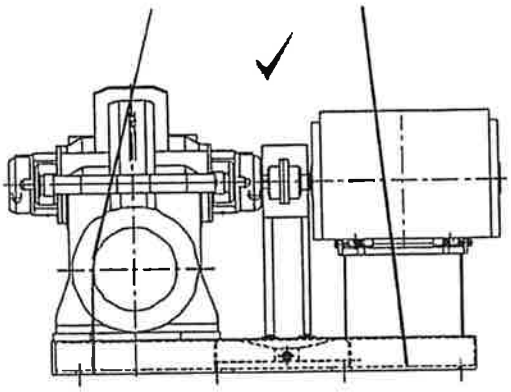
7.1.1 The pump should be checked against the bill of lading and any damage or shortages reported immediately to the carrier or Ingersoll-Dresser Pumps. Any crate/carton/wrappings should be checked for spare parts or accessories which may be packed with the pump.

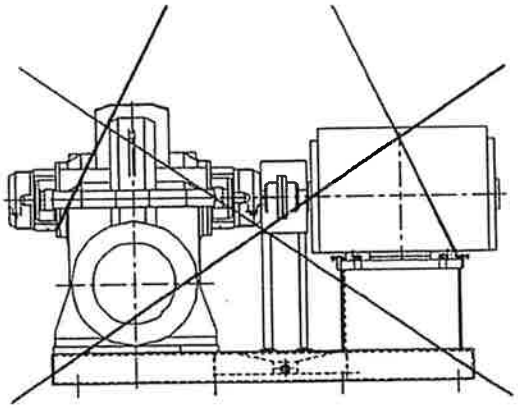


7.2 Handling

7.2.1 Boxes, crates, pallets or cartons may be unloaded using fork lift vehicles or slings dependent on their size and construction.

7.2.2 To avoid distortion, the pump unit should be lifted as shown.





7.3 Location

7.3.1 The pump should be located to allow room for access, ventilation, maintenance and inspection with ample headroom for lifting and should be as close as practicable to the supply of liquid to be pumped.

7.4 Foundation

7.4.1 There are many methods of installing pump units to their foundations. The correct method depends on the size of the pump unit, its location and noise vibration limitations. Non-compliance with the provision of correct foundation and installation may lead to failure of the pump and as such, would be outside the terms of the warranty.

7.4.2 The baseplate should be mounted onto a firm foundation, either an appropriate thickness of quality concrete or sturdy steel framework. It should NOT be distorted or pulled down onto the surface of the foundation, but should be supported to maintain the original alignment.

7.4.3 Install the baseplate onto packing pieces evenly spaced and adjacent to foundation bolts. Level with shims between baseplate and packing pieces. The pump and driver were aligned prior to shipment. Check alignment of pump and motor half coupling. If this is incorrect, it indicates that the baseplate has become twisted and should be corrected by re-shimming.

7.4.4 Vertical pumps shall be mounted following the practices outlined for baseplate mounted pumps. The motor should always be fitted after installation of the pump is completed.

7.4.5 If the pump is driven by a motor mounted on a separate floor using a vertical U-Joint shaft the equipment should be installed and aligned within the tolerances indicated on the general arrangement drawing(s) provided. Typically, the angular offset should be 1° maximum, the driver and driven shafts should be parallel to within 1°, and the support structures should be sufficiently rigid to avoid the excitation of any natural frequencies in the installed system. If not supplied, guarding shall be fitted as required.

7.5 Grouting

7.5.1 Where applicable, grout in the foundation bolts.

7.5.2 After connecting the suction and discharge piping, recheck the coupling alignment. The baseplate should then be grouted in accordance with good engineering practice. The baseplates should be filled with grout as shown on the general arrangement drawing(s). If in any doubt, contact the nearest IDP service center for advice.

7.5.3 Grouting provides solid contact between the pump unit and foundation, prevents lateral movement of vibrating equipment and dampens resonant vibrations.

7.6 Alignment of Couplings

7.6.1 Thermal Expansion

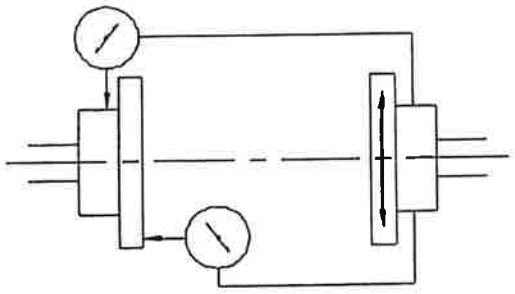
7.6.1.1 The pump and motor will normally have to be aligned at ambient temperature and should be corrected to allow for thermal expansion at operating temperature. In pump installations involving high liquid temperatures, the unit should be run at the actual operating temperature, shut down and the alignment checked immediately.

7.6.2 Alignment Methods

7.6.2.1 Ensure the pump and motor half couplings are disconnected.

7.6.2.2 The alignment MUST be checked. Although the pumping unit may have been aligned at the factory it must be field aligned due to handling an installation movement. Align the motor to the pump, not the pump to the motor. Alignment is achieved by adding or removing shims from under the motor feet and also moving the motor horizontally as required. In some cases where the alignment cannot be achieved it may be necessary to move the pump before recommencing the above procedure.

7.6.2.3 For couplings with narrow gaps, use a dial indicator gauge as shown. The alignment values are maximums for continuous service.



7.6.2.4 Permissible Misalignment limits at working temperature:

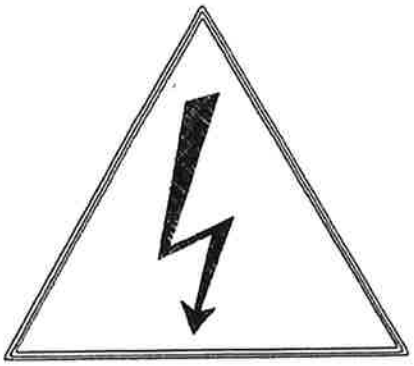
Parallel - to within 0.002" (0.05 mm) T.I.R.
Angular - to within 0.004" (0.1 mm) T.I.R.

7.6.2.5 For pumps with spacer couplings refer to the general arrangement drawing(s) for permissible misalignment limits or contact the nearest IDP service center for assistance.

7.6.2.6 When an electric motor if fitted with sleeve bearings it is necessary to ensure that the motor is aligned to run on its magnetic centerline. Refer to the motor manual for details. A limited end-float coupling is normally fitted between the motor and pump shaft ends to maintain the required axial position.

7.7 **Electrical Connections**

7.7.1 Electrical connections should be made by a qualified Electrician in accordance with the relevant Local, National and/or International regulations.



It is important to be aware of electromagnetic compatibility when wiring up and installing equipment on site. Attention must be paid to ensure that the techniques used during wiring/installation do not increase electromagnetic emissions or decrease the electromagnetic immunity of the equipment, wiring or any connected devices. If in any doubt, contact a local Electrical Contractor or Consultant for advice.

7.7.2 The motor must be wired up in accordance with the motor manufacturer's instructions (normally supplied within the terminal box) including any temperature, earth leakage, current and other protective devices as appropriate. The identification nameplate should be checked to ensure the power supply is appropriate.

7.7.3 A device to provide emergency stopping should be provided in the installed system.

7.7.4 If not supplied pre-wired with the pumping unit the controller/starter should be fitted with this protection.

7.7.5 For electrical details on pump sets with controllers see the controller wiring diagrams.

7.7.6 WARNING:
See paragraphs on 'direction of rotation' before connecting the motor to the electrical supply.

7.8 **Suction and Discharge Connections**

7.8.1 Protective covers are fitted to the pump flange connections to prevent foreign bodies entering during transportation and installation. Ensure that these covers are removed from the pump before connecting any pipes.

7.8.2 Maximum forces and moments allowed on the pump flanges vary with the pump size and type. To minimize these forces and moments which may cause misalignment, hot bearings, worn couplings, vibration and the possible failure of the pump casing, the following points should be strictly followed.

Prevent excessive external pipe loads.

Never draw piping into place by applying force to pump flange connections.

Do not mount expansion joints so that their force, due to internal pressure, acts on the pump flanges.

7.8.3 The suction pipe should be one or two sizes larger than the pump suction flange and suction piping bends should be as large a radius as possible. On suction lift the piping should be inclined up towards the pump inlet with eccentric reducers incorporated to prevent air pockets.

7.8.4 Allow a minimum of two pipe diameters of straight section between any suction elbow and the pumps suction flange. Inlet strainers, when used, should have a net `free area' of at least three times the inlet pipe area.

7.8.4.1 Do not install elbows at an angle other than perpendicular to the shaft axis. Elbows parallel to the shaft axis will cause uneven flow.

7.8.4.2 Except in unusual circumstances strainers are not recommended in inlet piping. If considerable foreign matter is expected, a screen installed at the entrance to the wet well is preferable.

7.8.5 Fitting an isolator and non-return valves can allow easier maintenance. Never throttle a pump on the suction side and never place a valve directly on the pumps suction nozzle.

7.8.6 A non-return valve should be located in the discharge piping to protect the pump from excessive back pressure and, hence, reverse rotation when the unit is stopped.

7.8.7 Piping and fittings should be flushed before use.

7.8.8 Piping for corrosive liquids should be arranged to allow pump flushing before removal of a unit.

7.9 Final Piping Check

7.9.1 After connecting piping to the pump, rotate the shaft several times by hand to ensure there is no binding and all parts are free.

7.9.2 Recheck the coupling alignment, as previously described, to ensure no pipe strain. If pipe strain exists, correct the piping.

7.10 Auxiliary Piping

7.10.1 Pumps with Packed Glands

7.10.1.1 When suction pressure is below ambient pressure it is necessary to feed the gland packing with liquid to provide lubrication and prevent the ingress of air.

7.10.1.2 When pumping 'dirty' liquids a clean liquid supply to the gland is recommended.

7.10.2 Pumps with Mechanical Seals

7.10.2.1 Single seals requiring re-circulation will normally be provided with the auxiliary piping from the pump casing already fitted.

7.10.2.2 Seal housings/covers having an auxiliary quench connection require connection to a suitable source of liquid flow, low pressure steam or static pressure from a header tank. [The recommended pressure is 5 psi (0.35 bar) or less].

7.10.2.3 Special seals may require modification to auxiliary piping described above. Consult Ingersoll-Dresser Pumps if unsure of correct method or arrangement.

7.10.2.4 For pumping hot liquids, to avoid seal damage, it is recommended that any external flush/cooling supply be continued after stopping the pump.

8 MAKING READY FOR OPERATION

8.1 Lubrication

8.1.1 Determine the mode of lubrication of the pump set, eg. grease, oil, product lubrication, etc.

8.1.2 For oil lubricated pumps, fill the bearing housing with correct grade of oil to the correct level, i.e. sight glass or constant level oiler bottle.

8.1.2.1 When fitted with a constant level oiler, the bearing housing should be filled by hinging back the constant level oiler and filling the transparent dome with oil. The dome should then be swung back to its operating position. This should be repeated until oil remains visible within the dome.

8.1.3 Grease lubricated pumps are supplied pre-greased. Adding of addition grease may result in the bearings running hot.

8.1.4 Drivers and gearboxes, if appropriate, should be lubricated in accordance with their manuals.

8.1.5 In the case of product lubricated bearings the source of product supply should be checked against the order; there may be requirements for an external clean supply, particular supply pressure or the commencement of lubrication supply before pump start-up.

8.2 Direction of Rotation

8.2.1 Ensure the pump is given the same rotation as the pump direction arrow.

8.2.2 If maintenance work has been carried out to the site's electricity supply, the direction of rotation should be re-checked as above in case the supply phasing has been altered.

8.3 Guarding

8.3.1 Guarding is normally supplied fitted to the pump set. If this has been removed or disturbed ensure that all the protective guards are securely refitted.

8.4 Primary and Auxiliary Supplies

8.4.1 Ensure all electrical, hydraulic, pneumatic, sealant and lubrication systems (as applicable) are connected and operational.

8.5 Filling and Priming

8.5.1 Ensure the suction piping and pump casing are completely full of liquid before starting continuous duty operation.

9 STARTING THE PUMP

9.1 Ensure flushing and/or cooling/heating liquid supplies are turned ON, before starting the pump set.

9.2 CLOSE the outlet valve.

9.3 OPEN all inlet valves.

9.4 Prime the pump.

9.4.1 Ensure all vent connections are closed before starting.

9.5 Start motor and check outlet pressure.

9.6 If pressure is satisfactory, slowly OPEN outlet valve.

9.7 Do not run the pump with the outlet valve closed for a period longer than 30 seconds.

9.8 If NO pressure, or LOW pressure, STOP the pump. Refer to the OPERATING DIFFICULTIES chart for fault diagnosis.

10 RUNNING

10.1 Vent the pump to enable all trapped air to escape taking due care with hot or hazardous liquids.

10.1.1 Under normal operating conditions, after the pump has been fully primed and vented, it should be unnecessary to re-vent the pump.

10.2 Pumps Fitted With Packed Glands

10.2.1 If the pump has a packed gland there must be some leakage from the gland. Gland nuts should initially be finger-tight only. Leakage should take place soon after the stuffing box is pressurized. If no leakage takes place the packing will begin to overheat. If overheating takes place the pump should be stopped and allowed to cool before being re-started. When the pump is re-started it should be checked to ensure leakage is taking place at the packed gland.

10.2.2 If hot liquids are being pumped it may be necessary to slacken the gland nuts to achieve leakage.

10.2.3 The pump should be run for ten minutes with steady leakage and the gland nuts tightened ~10 degrees at a time until leakage is reduced to an acceptable level, normally 30 to 120 drops per minute. "Bedding" in of the packing may take another 15 minutes.

10.3 Pumps Fitted With Mechanical Seals

10.3.1 Mechanical seals require no adjustment. Any slight initial leakage should stop when the seal is run in. Seals will always leak in operation.

10.3.2 Before pumping dirty liquids, it is advisable, if possible, to run the pump in using clean liquid to safeguard the seal face.

10.3.3 For external flush or quench, this should be started before the pump is run and allowed to flow for a period after the pump has stopped.

10.4 **Stop/Start Frequency**

10.4.1 STANDBY PUMPS SHOULD BE RUN ALTERNATELY.

11 STOPPING AND SHUTDOWN

11.1 Close the outlet valve, but ensure that the pump runs in this condition for no more than a few seconds.

11.2 Stop the pump.

11.3 Switch off flushing and/or cooling/ heating liquid supplies at a time appropriate to the process.

11.4 For prolonged shut-downs and especially when ambient temperatures are likely to drop below freezing point, the pump and any cooling and flushing arrangements must be drained or otherwise protected.

12 PREVENTATIVE MAINTENANCE AND SERVICING

12.1 **Maintenance Schedule**

12.1.1 Our specialist service personnel can help with preventative maintenance records and provide condition monitoring for temperature and vibration to identify the onset of potential problems.

12.2 **Routine Inspection (daily/weekly)**

12.2.1 The following checks should be made and the appropriate action taken to remedy any deviations.

12.2.2 Check operating behavior; and ensure noise, vibration and bearing temperatures are normal.

12.2.3 Check that there are no abnormal fluid or lubricant leaks (static and dynamic seals) and that any sealant systems (if fitted) are full and operating normally.

12.2.4 Check that shaft seal leaks are within acceptable limits.

12.2.5 Check the level and condition of oil lubricant. On grease lubricated pumps, check running hours since last recharge of grease or complete grease change.

12.2.6 Check any auxiliary supplies eg. heating/cooling (if fitted) are functioning correctly.

12.2.7 Refer to the manuals of any associated equipment for routine checks needed.

12.3 **Periodic Inspection (6 Monthly)**

12.3.1 Check foundation bolts for tightness of attachment and corrosion.

12.3.2 Check pump running records for hourly usage to determine if bearing lubricant requires changing.

12.3.3 The coupling should be checked for correct alignment and worn driving elements.

12.3.4 Refer to the manuals of any associated equipment for periodic checks needed.

12.4 **Lubrication Data**

12.4.1 **Oil Lubricated Bearings**

12.4.1.1 Normal oil change intervals are 4000 operating hours. For pumps on hot service or in severely damp or corrosive atmosphere, the oil will require changing more frequently. Lubricant and bearing temperature analysis can be useful in optimizing lubricant change intervals.

12.4.1.2 The lubricating oil should be a high quality oil having oxidization and foam inhibitors, or synthetic oil.

12.4.1.3 The bearing temperature may be allowed to rise to 50°C above ambient, but should not exceed 82°C (API 610 limit). A continuously rising temperature, or an abrupt rise, indicate a fault.

12.4.2 **Grease Lubricated Bearings**

12.4.2.1 When grease nipples are fitted, one charge between grease changes is advisable for most operating conditions; i.e. 2000 hours interval.

12.4.2.2 Normal intervals between grease changes are 4000 hours. The characteristics of the installation and severity of service will determine the frequency of lubrication.

Lubricant and bearing temperature analysis can be useful in optimizing lubricant change intervals.

12.4.2.3 For most operating conditions, a quality grease having a lithium soap base and NLGI consistency of No.2 is recommended. The drop point should exceed 350°F (175°C).

12.4.2.4 **WARNING**
Never mix greases containing different bases, thickeners or additives.

12.5 Gland packing

12.5.1 The stuffing box split gland can be completely removed for re-packing or to enable the addition of extra rings of packing.

12.5.2 The stuffing box is normally supplied with a lantern ring to enable a clean or pressurized flush to the center of the packing. If not required, this can be replaced by an extra 2 rings of packing.

12.6 Mechanical seals

12.6.1 When leakage becomes unacceptable the seal will need replacement.

13 DISMANTLING AND ASSEMBLY

13.1 Dismantling

13.1.1 **WARNING** Refer to safety section before dismantling the pump.

13.1.2 Before dismantling the pump for overhaul, ensure genuine Ingersoll-Dresser Pumps replacement parts are available.

13.1.3 Refer to the pumps sectional assembly drawing for part numbers and identification.

Rotor unit

Remove coupling guards and disconnect the coupling halves.

Drain pump casing. Remove any auxiliary piping if applicable.

Unscrew and remove bearing housing screws.

Unscrew and remove the nuts above the split flange on the upper half casing. Drive out location pins (if fitted) from casing flange halves. Remove the upper half casing.

Take out complete rotor unit and place onto two support blocks.

Bearing Housing

NOTE: The bearing housings, bearings and shaft seals can be removed without removal of the upper half casing if desired.

Remove bearing cover screws and remove the coupling key from the shaft end.

Remove the outer 'V' ring seal and remove the bearing housings from the rotor.

Line Bearings

Remove the line bearing (241.00) from the shaft using a bearing puller ensuring the pulling force is applied to the inner race only.

Thrust Bearings

Unscrew and remove the self locking bearing nut (366.00) and remove the bearing (231.00) using a puller as above.

Shaft Seal

STUFFING BOX

Remove the gland nuts and gland (406.00). Lever gland ring (409.00) out using its grip groove.

Remove gland packing rings (404.00) and lantern rings (405.00) using a bent wire.

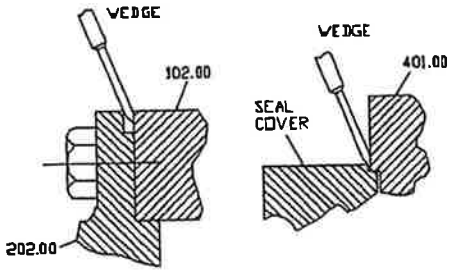
MECHANICAL SEAL

Remove the seal cover screws and pull off the seal cover complete with the stationary seal ring which is held in place by the 'O' ring seal.

Shaft Sleeve

Loosen the locking screw (363.01) and unscrew shaft nut (363.00). Remove shaft sleeve (351.00) using its pulling groove.

After unbolting the bearing housing, move it back using a wedge.



The mechanical seal cover can also be removed by placing a wedge into the gland chamfer.

Wear Rings

When removing the rotor unit, the casing rings (161.00) will be attached to it as they are fixed by two diametrically opposite pins (161.01) inserted into the casing ring and located in grooves in the lower half casing.

If impeller rings (321.00) are also fitted, they are shrunk onto the impeller and fixed with locking screws (321.01) between their diametral mating surfaces. To remove the impeller rings, remove the locking screws and heat up the ring until it slides off easily.

13.2 **Examination of Parts**

13.2.1 Used parts must be inspected before assembly to ensure the pump will subsequently run properly. In particular, fault diagnosis is essential to enhance pump and plant reliability.

13.2.2 **Casing, Seal Housing and Impeller**

13.2.2.1 Inspect for excessive wear, pitting, corrosion, erosion or damage and any sealing surface irregularities. Replace as necessary.

13.2.3 **Shaft and Sleeve (if fitted)**

13.2.3.1 Replace if grooved, pitted or worn.

13.2.4 **Gaskets and O-Rings**

13.2.4.1 After dismantling, discard and replace.

13.2.5 **Bearings**

13.2.5.1 It is recommended that bearings are not re-used after any removal from the shaft.

13.2.5.2 The plain bearings may be re-used if both the bearing bush and bearing sleeve show no sign of wear, grooving or corrosion attack. It is recommended that both the bush and sleeve are replaced at the same time.

13.2.6 **Bearing Isolators, Labyrinths or Lip Seals (if fitted)**

13.2.6.1 The lubricant, bearings and bearing housing seals are to be inspected for contamination and damage. If oil bath lubrication is utilized, these provide useful information on operating conditions within the bearing housing. If bearing damage is not due to normal wear and the lubricant contains adverse contaminants, the cause should be corrected before the pump is returned to service.

13.2.6.2 Labyrinth seals and bearing isolators should be inspected for damage but are normally non-wearing parts and can be re-used.

13.2.6.3 Bearing seals are not totally leak free devices. Oil from these may cause staining adjacent to the bearings.

13.3 **Assembly**

13.3.1 To assemble the pump refer to the sectional assembly drawing provided.

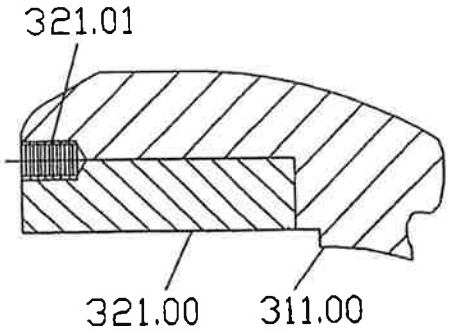
13.3.2 Ensure threads, gasket and O-ring mating faces are clean. Apply thread sealant to non-face sealing pipe thread fittings.

13.3.3 **Wear Rings**

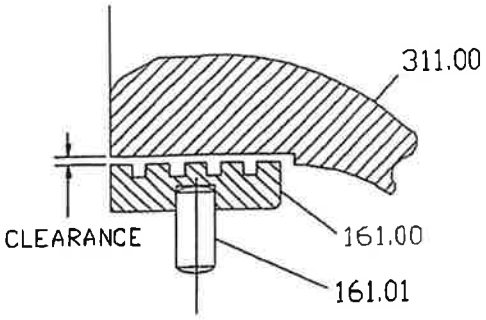
Impeller rings (when fitted) should be heated up using a hotplate or hot oil bath and then slipped onto the impeller and pressed down to the shoulder.

DO NOT USE A STEEL HAMMER TO DRIVE IT INTO POSITION

Drill and tap 3 holes approximately 120° apart into the diametral mating faces of the ring and impeller and insert locking screws. (The existing half tapped holes from the removed impeller ring cannot be re-used).



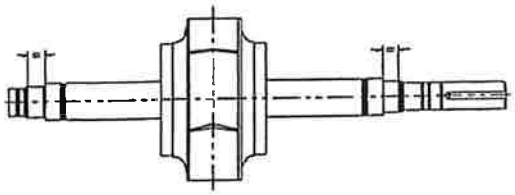
Slip the casing wear rings over the impeller hubs before mounting the rotor unit into the lower half casing, ensuring the holes in the rings locate onto the pins in the casing.



Check the running clearance between impeller and casing ring against the appropriate pump size in section 4.9

13.3.4 Rotor Unit

The two shaft sleeves and shaft nuts clamping the impeller define its position on the pump shaft and, hence, in the pump casing.



The correct axial position of the impeller and mechanical seals can be checked with the grooved checking marks on the pump shaft.

Shaft Seal

STUFFING BOX

Fit impeller key and slide impeller onto shaft.

Insert 'O' ring into shaft sleeves and slide sleeves along shaft and into the impeller hubs. Lightly lubricate the shaft and 'O' for easier assembly.

Tighten and adjust the shaft nuts so that their distances to the grooved marks are equal at both ends.

Lock the shaft nuts in place with locking screws.

Slide the stuffing box housings over the shaft and fit the 'O' ring (414.00).

WARNING This 'O' ring must be replaced at each and every dismantling.

Place the gland ring over the sleeve.

MECHANICAL SEAL

Slide the rotating assembly of the mechanical seal along the shaft sleeve until the retaining ring has reached the correct setting distance along the sleeve. Tighten the set screws to lock it into position.

Insert 'O' ring into shaft sleeves and slide sleeves along shaft and into the impeller hubs. Lightly lubricate the shaft and 'O' ring for easier assembly.

Tighten and adjust the shaft nuts so that their distances to the grooved marks are equal at both ends.

Lock the shaft nuts in place with set screws.

Slide the seal housings over the shaft and fit the 'O' ring (414.00).

WARNING This 'O' ring must be replaced at each and every dismantling.

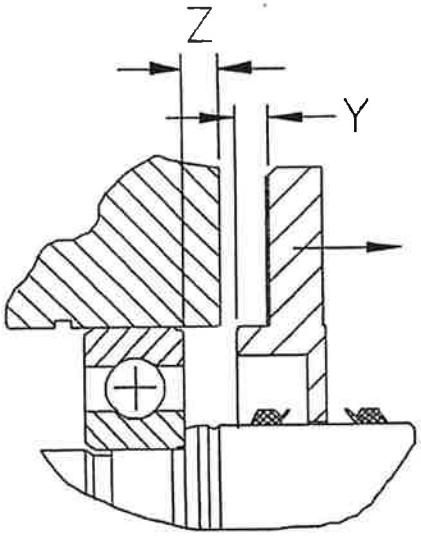
Slip the mechanical seal covers together with their installed stationary seal parts and 'O' rings over the shaft.

Bearings

BEFORE MOUNTING THE BEARINGS, proceed as follows:

Mount the 'V' ring seals (378.00) onto the shaft and slide the bearing cover (252.00) over the shaft.

Determine the thickness of the laminated shim on the thrust bearing side. Provisionally position the bearing into the bearing housing seated against the circlip and thrust washer.

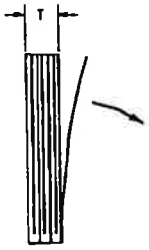


Measure distance 'Z' to face of bearing housing.

Measure distance 'Y' of bearing cover.

Shim thickness with correct clearance will be 'Z' minus 'Y'. Place correct shims on shaft.

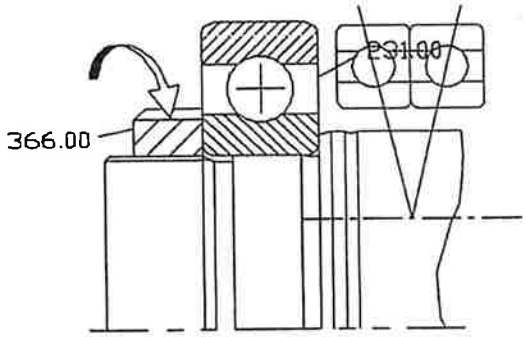
NOTE: The shim is a laminated material with an original thickness of 0.040" (1.0 mm) and laminate thickness of 0.002" (0.05 mm) which allows the thickness to be varied in 0.002" (0.05 mm) increments by peeling off layers to achieve the required axial clearance. (Refer to assembly drawing for correct clearance).



For oil lubricated units only, place the inner 'V' ring (379.00) in the groove for correct positioning.

The bearing should be heated up to 100°C using a hotplate or hot oil bath and then slipped onto the shaft to the shoulder.

On the thrust bearing side mount the self locking ring type nut.



Double row bearing arrangements should be mounted with the shoulders of the inner rings arranged face to face as shown.

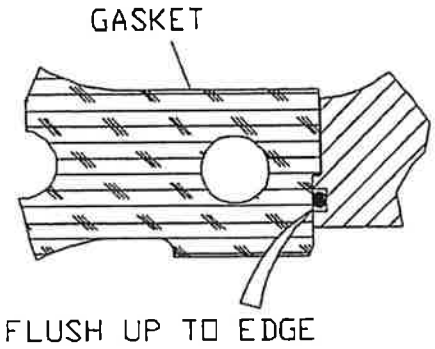
Rotor Unit

After completion of the preceding steps, carefully place the rotor into the lower half pump casing. Make sure the fixing pins of the casing rings fit correctly in the casing grooves and ensure correct fit of locating pins at the stuffing box housing.

Although both stuffing box housings are identical the locating pins in the lower half casing are different for drive and non-drive sides. The stuffing box housing should be rotated so that the correct slot engages with the pin. The long pin with small diameter must engage in the small deep slot while the short larger diameter pin engages in the shallower wider groove.

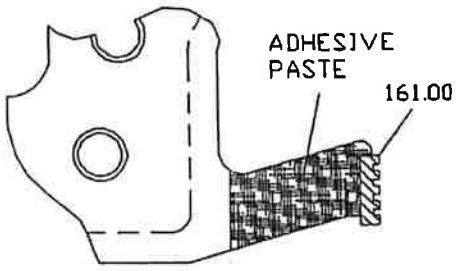
Casing Gasket

The gasket must be cut from asbestos free material of 1/32" (0.8 +0.1/-0.05 mm) thickness, by following the actual inner casing contour of the lower half casing. Special care must be exercised at the bores and stuffing box housing. The gasket must be accurately cut and fit flush with these bores to prevent leakage at the 'O' ring.



Position gasket carefully onto the cleaned surface of the lower half casing. Coat the flange surface of the wall between suction and discharge side with an adhesive paste (CYANOACRYLATE or RTV SILICONE).

Push gasket flush against fit of stuffing box housing and secure gasket locally again using above adhesive paste.

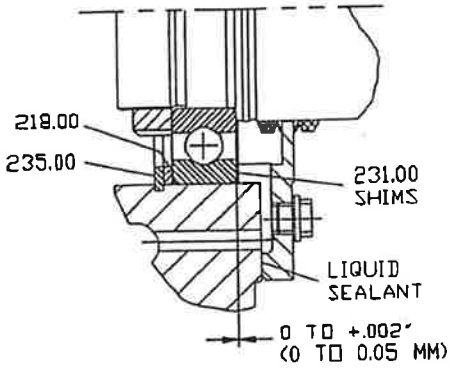


Place upper half casing onto pump ensuring dowels for the stuffing boxes and bearing housing make correct alignment. Tighten upper half casing flange nuts to correct torque.

Bearing Housing

Insert the circlip and thrust washer at the thrust bearing (non-drive end on LNN/LNNC units).

THE CIRCLIP AND THRUST WASHER MUST NOT BE FITTED AT THE LINE BEARING END.



On oil lubricated units place inner 'V' ring (379.00) into locating groove in shaft at drive end.

Slip the bearing housings over their respective bearings and insert them into the recesses of the pump casing. Install the bearing housing screws and tighten.

Apply liquid sealant to bearing cover flange.

Ensure correct seating of shim (and inner 'V' rings of oil lubricated units).

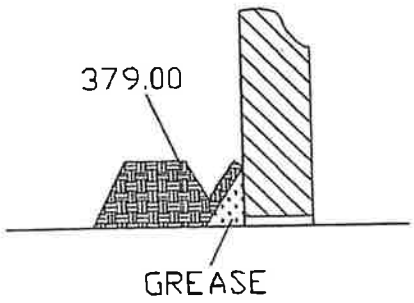
Turn bearing cover to correct position:

Grease lubricated units:- grease nipple towards top half casing.

Oil lubricated units:- plug towards bottom half casing.

Tighten bearing cover at bearing housing and push the 'V' ring against the bearing cover.

NOTE: THE SEALING SURFACE OF THE 'V' RING MUST BE COVERED WITH GREASE AND PUSHED GENTLY UP TO THE BEARING COVER, OTHERWISE IT MAY RUN HOT!



Refit plugs, vents, oiler, etc. as applicable.

Stuffing box assembly

Soft packing: Insert inner two rings of packing, then lantern ring halves and finally 2 or 3 more rings of packing.

Loosely fit the gland and connect flush line.

Mechanical seal: Fasten seal cover complete with 'O' ring and connect flush line.

Connect any auxiliary piping.

14 OPERATING DIFFICULTIES

SYMPTOMS

	PUMP DOES NOT DELIVER LIQUID ↓	INSUFFICIENT CAPACITY DELIVERED ↓	INSUFFICIENT PRESSURE DEVELOPED ↓	PUMP LOSES PRIME AFTER STARTING ↓	PUMP REQUIRES EXCESSIVE POWER ↓	MECHANICAL SEAL LEAKS EXCESSIVELY ↓	MECHANICAL SEAL HAS SHORT LIFE ↓	PUMP VIBRATES OR IS NOISY ↓	BEARINGS HAVE SHORT LIFE ↓	PUMP OVERHEATS AND SEIZES
SUCTION TROUBLES										
Pump not primed.	●									●
Pump or suction pipe not completely fulled with liquid.	●	●		●				●		
Suction lift too high.	●	●		●				●		
Insufficient margin between suction pressure and vapor pressure.	●	●						●		●
Excessive amount of air or gas in liquid.		●	●	●						
Air or vapor pocket in suction line.	●	●		●						
Air leaks into suction line.		●		●						
Air leaks into pump through mechanical sea, sleeve joints, casing joints or pipe lugs.		●		●						
Foot valve too small.		●						●		
Foot valve partially clogged.		●						●		
Inlet of suction pipe insufficiently submerged.	●	●		●				●		
SYSTEM TROUBLES										
Speed too low.	●	●	●							
Speed to high.					●					
Total head of system higher than head of pump.	●	●	●							
Total head of system lower than pump design head.					●					
Specific gravity of liquid different from design.					●					
Viscosity of liquid differs from that for which designed.		●	●		●					
Operation at very low capacity.								●		●
Operation at high capacity.					●			●	●	
MECHANICAL TROUBLES										
Misalignment due to pipe strain.					●	●	●	●	●	●
Improperly designed foundation.								●		
Shaft bent.					●	●	●	●	●	
Rotating part rubbing on stationary part internally.					●			●	●	●

SYMPTOMS

	PUMP DOES NOT DELIVER LIQUID ↓	INSUFFICIENT CAPACITY DELIVERED ↓	INSUFFICIENT PRESSURE DEVELOPED ↓	PUMP LOSES PRIME AFTER STARTING ↓	PUMP REQUIRES EXCESSIVE POWER ↓	MECHANICAL SEAL LEAKS EXCESSIVELY ↓	MECHANICAL SEAL HAS SHORT LIFE ↓	PUMP VIBRATES OR IS NOISY ↓	BEARINGS HAVE SHORT LIFE ↓	PUMP OVERHEATS AND SEIZES ↓
Bearing worn.						●	●	●	●	●
Wearing ring surfaces worn.		●	●		●					
Impeller damaged or eroded.		●	●					●		
Leakage under sleeve due to joint failure.						●				
Shaft sleeve worn or scored or running off center.						●	●			
Mechanical seal improperly installed.					●	●	●			
Incorrect type of mechanical seal for operating conditions.					●	●	●			
Shaft running off center because of worn bearings or misalignment.						●	●	●	●	●
Impeller out of balance resulting in vibration.						●	●	●	●	●
Abrasive solids in liquid pumped.					●	●	●			
Internal misalignment of parts preventing seal ring and seat from mating properly.						●	●			
Mechanical seal was run dry.						●	●			
Internal misalignment due to improper repairs causing impeller to rub.						●	●			
Excessive thrust caused by a mechanical failure inside the pump.								●	●	●
Excessive grease in ball bearings.								●	●	
Lack of lubrication for bearings.								●	●	
Improper installation of bearings (damage during assembly, incorrect assembly, wrong type of bearings, etc).								●	●	
Damaged Bearings due to contamination.								●	●	
MOTOR ELECTRICAL FAILURE										
Wrong direction of rotation.		●	●		●			●		
Motor running on 2 phases only.		●			●					
Motor running too slow, check terminal box.		●						●	●	

15 SPARE PARTS

15.1 Ordering of Spares

15.2 Ingersoll-Dresser Pump keep an accurate record of all pumps that have been supplied. When ordering spares the following information should be provided:

(1) Pump serial number.
(2) Pump size.
(3) Part name.
(4) Part number.
(5) Number of parts required.

15.3 The pump size and serial number are shown on the pump nameplate.

15.4 To ensure continued satisfactory operation, replacement parts to the original design specification should be obtained from Ingersoll-Dresser Pumps. Any change to the original design specification (modification or use of a non-standard part) will invalidate the pumps warranty and may compromise safe operation.

15.5 Recommended Spares

For start up purposes:

1 - Complete set of gland packing
2 - Shaft sleeves
1 - Set of gaskets and seals
OPTIONAL
2 - Mechanical seals

For 2 years operation:
1 - Set of bearings (line and thrust)
2 - Sets of gland packing
2 - Shaft sleeves
2 - Sets of gaskets and seals
2 - Lantern rings
2 - Casing wear rings
OPTIONAL
2 - Mechanical seals
2 - Impeller wear rings

For 4 years operation:
1 - Set of bearings (line and thrust)
2 - Sets of gland packing
2 - Shaft sleeves
2 - Sets of gaskets and seals
2 - Lantern rings
2 - Casing wear rings
1 - Impeller
1 - Complete set of mechanical seals and gaskets OPTIONAL
2 - Mechanical seals
2 - Impeller wear rings

15.6 Storage of Spares

15.6.1 Spares should be stored in a clean dry area away from vibration. Inspection and retreatment of metallic surfaces (if necessary) with preservative is recommended at 6 month intervals.

16 COPYRIGHT

16.1 No part of this Manual may be reproduced in any form without the prior permission in writing of the Ingersoll-Dresser Pump Co.

17 GENERAL ARRANGEMENT DRAWING

17.1 A general arrangement drawing and any specific drawings required by the Contract will be sent to the Purchaser separately. If required, these should be obtained from the Purchaser and retained with this manual.

18 SECTIONAL ASSEMBLY DRAWING AND PARTS LIST

18.1 A Sectional Assembly drawing and Parts List will be sent to the Purchaser separately. Again, this should be retained with this manual.

19 CERTIFICATION

19.1 Any certificates eg. materials, performance test curves, etc. as determined by the Contract requirements, will be sent to the Purchaser separately. If required, copies of these should be obtained from the Purchaser for retention with this manual.

20 SUPPLEMENTARY INSTRUCTION MANUALS

20.1 See also the supplementary instruction manuals supplied for other equipment associated with this pump eg. for electric motors, controllers, engines, gearboxes, sealant systems, etc.

21 CHANGE NOTES

21.1 If changes are made to the pump after supply, this manual will require updating.

FLOWSERVE PUMP DIVISION		PERFORMANCE TEST CERTIFICATE	
Newark Operations			
Customer	I.D.P. TANEYTOWN 7179.	Order No.	G415642/0010
Customer Order No.	PO70032	Serial No.	415642-0010-02
Customer Item No.	P-8-4	Pump Size	300LNN600

DUTY CONDITIONS

Flowrate	6000 USgpm	Total Head	360 ft	Speed	1775 rpm
Specific Gravity	1.00	Efficiency	83.7 %	Impeller Diameter	19.88 in

MOTOR DATA

Contract / Test	Test Motor						
Manufacturer	BROOK		Serial No. GH 017049			Frame Size	7-AD355M
Rated Power	315 kW	Amps	492 A	Voltage	415 V	Cycles	50 Hz

FIXED TEST DATA

Gauge Height Correction	0.85 m		
Diameter at Suction Tapping	350 mm	Diameter at Discharge Tapping	300 mm

TEST RESULTS

READING	UNITS	1	2	3	4	5	6	7	8	9	10
INPUT DATA											
Flowrate	m^3/h	1250	1124	997.5	747	497	249	0			
Suction Head	m	-2.8	-2.6	-2.48	-2.15	-1.95	-1.8	-1.8			
Discharge Head	m	43	49.5	54.6	64.2	71.2	72.7	75			
Speed	rpm	1299	1299	1300	1301	1303	1304	1304			
Amps	A	0	0	0	0	0	0	0			
Volts	V	0	0	0	0	0	0	0			
Motor Power Input	kW	206.59	199.93	192.32	169.86	142.15	108.27	93.932			
CALCULATED DATA											
Vel Head Correction	m	0.57	0.46	0.36	0.20	0.09	0.02	0.00			
Pump Total Head	m	47.22	53.41	58.29	67.40	74.09	75.37	77.65			
Motor Power Output	kW	206.6	199.9	192.3	169.9	142.2	108.3	93.9			
CALCULATED DATA CORRECTED TO 1775 rpm									S.G.= 1.00		
Flowrate	USgpm	7520	6762	5997	4487	2981	1492	0			
Pump Total Head	ft	289	327	357	412	451	458	472			
Power Absorbed	bhp	706.8	684.0	656.5	578.5	481.9	366.2	317.7			
Pump Efficiency	%	77.9	81.8	82.4	80.8	70.6	47.2	0.0			
Overall Efficiency	%	77.9	81.8	82.4	80.8	70.6	47.2	0.0			

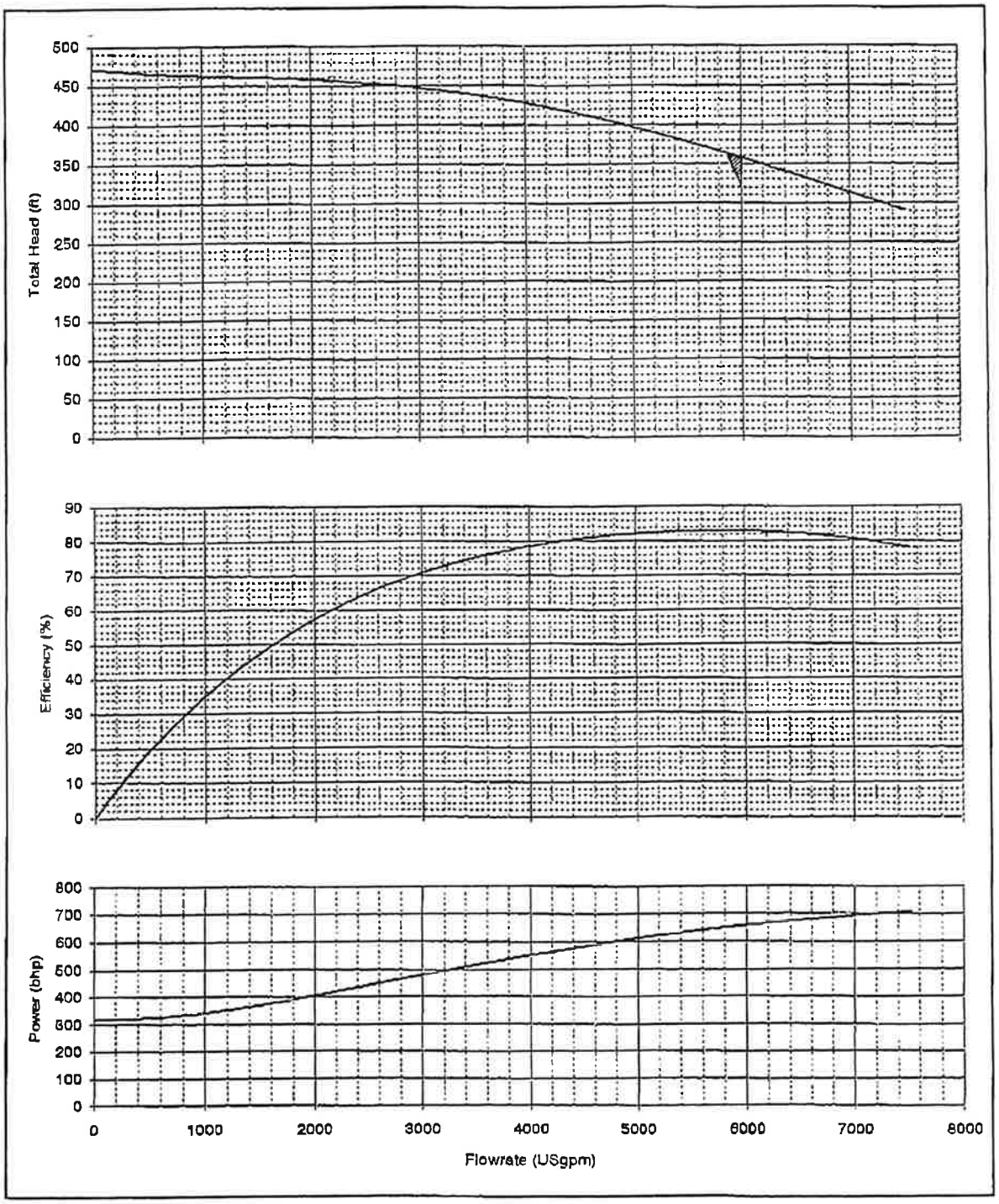
COMMENTS INVERTER DRIVEN TEST RIG.

Tested by : S.CLARK Approved by : Mbaad Date: 29/05/2001

Witnessed by : For :

FLOWSERVE PUMP DIVISION Newark Operations		PERFORMANCE TEST CURVE	
Customer	I.D.P. TANEYTOWN 7179.	Order No.	G415642/0010
Customer Order No.	PO70032	Serial No.	415642-0010-02
Customer Item No.	P-8-4	Pump Size	300LNN600

DUTY CONDITIONS					
Flowrate	6000 Usgpm	Total Head	360 ft	Speed	1775 rpm
Specific Gravity	1.00	Efficiency	83.7 %	Impeller Diameter	19.88 in



FLOWSERVE PUMP DIVISION Newark Operations		PERFORMANCE TEST CERTIFICATE	
Customer	I.D.P. TANEYTOWN 7179.	Order No.	G415642/0010
Customer Order No.	PO70032	Serial No.	415642-0010-03
Customer Item No.	P-8-5	Pump Size	300LNN600

DUTY CONDITIONS					
Flowrate	5997 USgpm	Total Head	360 ft	Speed	1775 rpm
Specific Gravity	1.00	Efficiency	83.7 %	Impeller Diameter	20.28 in

MOTOR DATA							
Contract / Test	Test Motor						
Manufacturer	BROOK		Serial No. GH 017049			Frame Size	7-AD355M
Rated Power	315 kW	Amps	492 A	Voltage	415 V	Cycles	50 Hz

FIXED TEST DATA			
Gauge Height Correction	0.85 m		
Diameter at Suction Tapping	350 mm	Diameter at Discharge Tapping	300 mm

TEST RESULTS											
READING	UNITS	1	2	3	4	5	6	7	8	9	10

INPUT DATA											
Flowrate	m^3/h	1250	1124	997.5	747	497	249	0			
Suction Head	m	-2.8	-2.6	-2.45	-2.15	-1.9	-1.8	-1.8			
Discharge Head	m	46.5	51.8	57	65.5	71.2	72.8	74.5			
Speed	rpm	1300	1300	1300	1301	1303	1303	1305			
Amps	A	0	0	0	0	0	0	0			
Volts	V	0	0	0	0	0	0	0			
Motor Power Input	kW	212.2	205.53	195.32	171.9	142.84	109.55	93.184			

CALCULATED DATA											
Vel Head Correction	m	0.57	0.46	0.36	0.20	0.09	0.02	0.00			
Pump Total Head	m	50.72	55.71	60.66	68.70	74.04	75.47	77.15			
Motor Power Output	kW	212.2	205.5	195.3	171.9	142.8	109.5	93.2			

CALCULATED DATA CORRECTED TO 1775 rpm								S.G.= 1.00			
Flowrate	USgpm	7515	6757	5997	4487	2981	1493	0			
Pump Total Head	ft	310	341	371	420	451	459	468			
Power Absorbed	bhp	724.3	701.6	666.7	585.4	484.2	371.4	314.4			
Pump Efficiency	%	81.4	83.0	84.4	81.4	70.2	46.7	0.0			
Overall Efficiency	%	81.4	83.0	84.4	81.4	70.2	46.7	0.0			

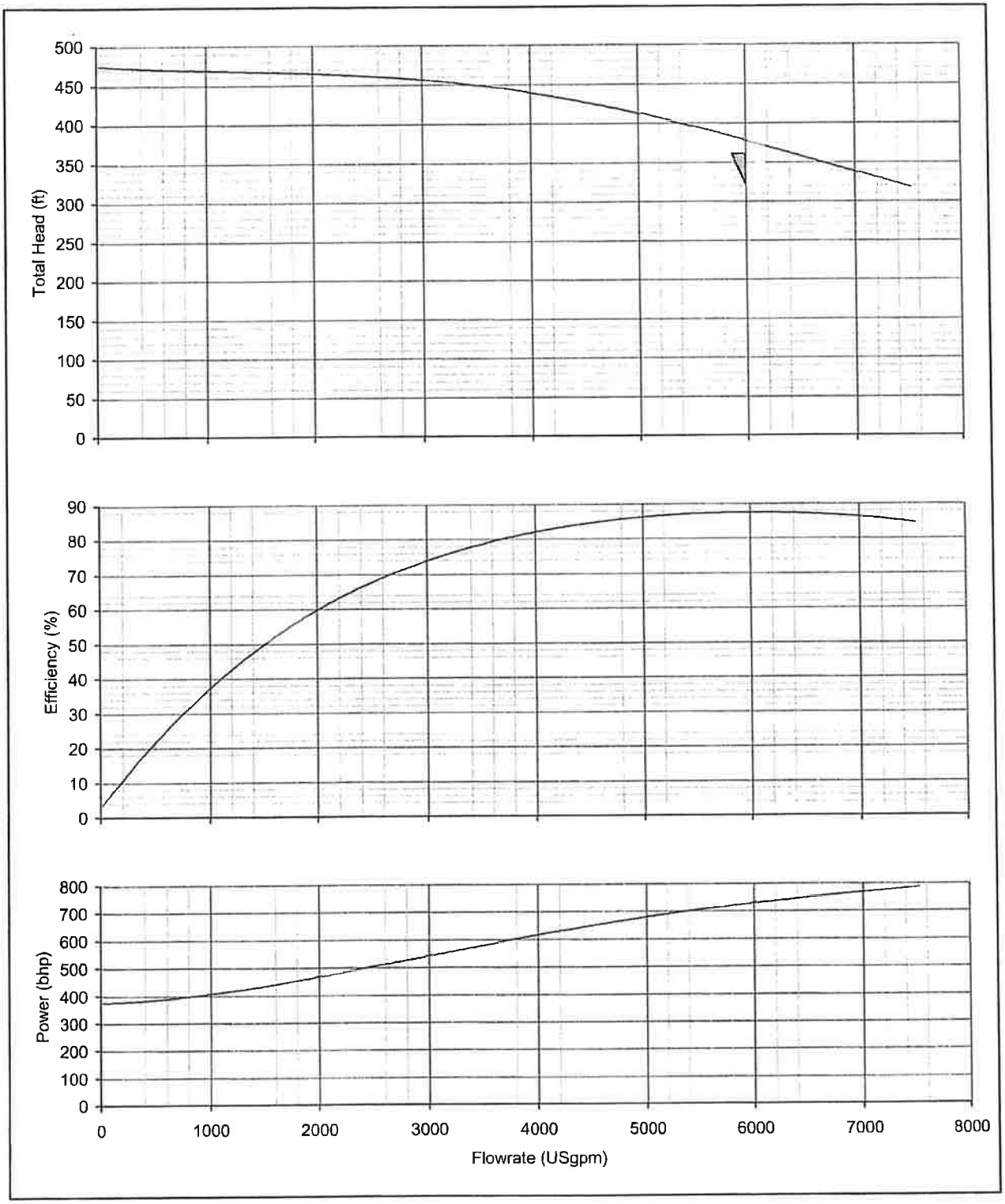
COMMENTS INVERTER DRIVEN TEST RIG.

Tested by : S.CLARK. Approved by : Date: 30/05/2001

Witnessed by : For :

FLOWSERVE PUMP DIVISION Newark Operations		PERFORMANCE TEST CURVE	
Customer	I.D.P. TANEYTOWN 7179.	Order No.	G415642/0010
Customer Order No.	PO70032	Serial No.	415642-0010-03
Customer Item No.	P-8-5	Pump Size	300LNN600

DUTY CONDITIONS					
Flowrate	5997 Usgpm	Total Head	360 ft	Speed	1775 rpm
Specific Gravity	1.00	Efficiency	83.7 %	Impeller Diameter	20.28 in



FLOWSERVE

CERTIFICATE OF HYDROSTATIC TEST

CUSTOMER:	IDP TANEYTOWN	**FLOWSERVE REF:**	G415642/0010
CUSTOMER No:	PO70032	**UNIT SIZE:**	300-LNN-600
SERIAL No:	415642-0010-02		
ITEM No:	P-8-4		

This is to certify that the following component parts on the above order have been tested and accepted to the hydraulic test conditions stated below.

COMPONENT DESCRIPTION	TEST CONDITIONS
PUMP CASING	377PSI FOR 30 MINS

FOR AND ON BEHALF OF FLOWSERVE PUMP DIVISION.:

NAME: G. RAWSON **POSITION:** QUALITY ENGINEER

DATE: 16.07.2001 **SIGNED:** [signature]

WI&P090
FEB'98

FLOWSERVE

CERTIFICATE OF HYDROSTATIC TEST

CUSTOMER:	IDP TANEYTOWN	**FLOWSERVE REF:**	G415642/0010
CUSTOMER No:	PO70032	**UNIT SIZE:**	300-LNN-600
SERIAL No:	415642-0010-03		
ITEM No:	P-8-5		

This is to certify that the following component parts on the above order have been tested and accepted to the hydraulic test conditions stated below.

COMPONENT DESCRIPTION	TEST CONDITIONS
PUMP CASING	377PSI FOR 30 MINS

FOR AND ON BEHALF OF
FLOWSERVE PUMP DIVISION.:

NAME: G. RAWSON **POSITION:** QUALITY ENGINEER

DATE: 16.07.2001 **SIGNED:**