CITY OF GRAND ISLAND

**Working Together for a Better Tomorrow. Today.**

# SPECIFICATION PACKAGE
## 117-12

# for

# CIRCULATION WATER PUMP REPAIR

**Bid Opening Date/Time**
**Tuesday, October 30, 2012 @ 2:30 p.m. (local time)**
**City of Grand Island, City Hall**
**100 East 1st Street, P.O. Box 1968**
**Grand Island, NE 68802-1968**

**Contact**
**City of Grand Island – Utilities Department**
**Platte Generating Station**
**308/385-5496**

**Date issued: October 12, 2012**

**ADVERTISEMENT TO BIDDERS**
**FOR**
**CIRCULATION WATER PUMP REPAIR**
**FOR**
**CITY OF GRAND ISLAND, NEBRASKA**

**Sealed bids will be received at the office of the City Clerk, 100 E. First Street, P.O. Box 1968, Grand Island, Nebraska 68802, until Tuesday, October 30, 2012 at 2:30 p.m. local time for Circulation Water Pump Repair, FOB the City of Grand Island, freight prepaid. Bids will be publicly opened at this time in the Grand Island City Hall Council Conference Room #1 located on 1st floor of City Hall. Submit an original and three copies. Bid proposal package is also available on-line at www.grand-island.com under Business-Bid Calendars. Bids received after the specified time will be returned unopened to sender.**

The successful bidder will be required to comply with fair labor standards as required by Nebraska R.R.S.73-102 and comply with Nebraska R.R.S. 48-657 pertaining to contributions to the Unemployment Compensation Fund of the State of Nebraska. Successful bidder shall maintain a drug free workplace policy. Every public contractor and his, her or its subcontractors who are awarded a contract by the City for the physical performance of services within the State of Nebraska shall register with and use a federal immigration verification system to determine the work eligibility status of new employees physically performing services within the State of Nebraska.

Each bidder shall submit with the bid a certified check, a cashiers check, or bid bond payable to the City Treasurer in an amount no less than five percent (5%) of the bid price which shall guarantee good faith on the part of the bidder and the entering into a contract within fourteen (14) days at the bid price if accepted by the City. **Your certified check, cashier's check or bid bond must be submitted in a separate envelope attached to the outside of the envelope containing the bid. Each envelope must be clearly marked indicating its contents. Failure to submit the necessary qualifying information in clearly marked and separate envelopes will result in your bid not being opened or considered.** Surety companies authorized to do business in the State of Nebraska must issue bid bonds.

Bids will be evaluated by the Purchaser based on price, schedule, quality, adherence to schedule, plan and specifications, economy and efficiency of operation, experience and reputation of the bidder, ability, capacity, and skill of the bidder to perform contract required and adaptability of the particular items to the specific use intended.

The Purchaser reserves the right to reject any or all bids, to waive irregularities therein, and to accept whichever bid that may be in the best interest of the City, at its sole discretion.

No bidder may withdraw his bid for a period of thirty (30) days after date of bid opening.

RaNae Edwards, City Clerk

# CIRCULATION WATER PUMP REPAIR
# BID DATA FORM

CITY OF GRAND ISLAND
GRAND ISLAND, NE

The undersigned bidder, having examined all specifications and other bidding documents, and all addenda thereto, and being acquainted with and fully understanding all conditions relative to the specified materials and equipment, hereby proposes to provide such equipment FOB the City of Grand Island, freight prepaid, at the following price:

| **ITEM DESCRIPTION** | EXTENDED COST |
|---|---|
| Base Bid: | |
| Material | $ _____ |
| Labor | $ _____ |
| Applicable Sales tax* | $ _____ |
| Total Base Bid | $ _____ |

*** If bidder fails to include sales tax in their bid price or takes exception to including sales tax in their bid price, the City will add a 7.0% figure to the bid price for evaluation purposes; however, the City will only pay actual sales tax due.**

☐ By checking this box, Bidder acknowledges that Addenda Number(s) _____ were received and considered in Bid preparation.

☐ By checking this box, Bidder acknowledges the specified completion date of the project is **November 27, 2012.**

According to Nebraska Sales and Use Tax Requirements, Section 1-017, Contractors, check which option you have selected to file with the Nebraska Department of Revenue:

*Nebraska law provides a sales and use tax exemption on contractor labor charges for the construction, repair, or annexation of any structure used for the generation, transmission, or distribution of electricity. Separately stated contractor labor would be exempt, all materials are taxable according to the contractor's option.*

Option 1 (Section 1-017.05)_____ Option 2 (Section 1-017.06)_____ Option 3 (Section 1-017.07)_____

*If the Nebraska sales and use tax election is not filed or noted above, the contractor will be treated as a retailer under Option 1 for sales and use tax purposes.*

_____
Bidder Company Name Date

_____
Company Address City State Zip

_____
Print Name of Person Completing Bid Signature

Telephone No._____ Fax No._____

☐ By checking this box, Bidder acknowledges there are Exceptions noted to the bid.
**NOTE: Any exceptions to specifications must be fully explained on a separate sheet attached to bid.**

**CHECKLIST FOR BID SUBMISSION**

**FOR**

**CIRCULATION WATER PUMP REPAIR**

**Bids must be received by the City Clerk before *2:30 p.m. on Tuesday, October 30, 2012*.**

The following items must be completed for your bid to be considered.

- ❑ A signed original and three copies of the bidding documents.
- ❑ A reference list of at least three projects of similar scope and complexity.
- ❑ Firm lump sum pricing; firm unit pricing in case adjustments are necessary, and breakout of sales tax pricing.
- ❑ A proposed schedule/completion date.
- ❑ Selection of Nebraska Sales Tax Option.
- ❑ Acknowledgment of Addenda Number(s) _____.
- ❑ Bidders must complete and sign the Bid Data Form provided in these Documents. All blank spaces must be filled in. Bidders shall acknowledge receipt of any Addenda information on the Bid Data Form.
- ❑ A certified check, cashiers check or bid bond in a separate envelope attached to the **outside of the envelope containing the bid**. Each envelope must be clearly marked indicating its contents. Failure to submit the necessary qualifying information in clearly marked and separate envelopes will result in your bid not being opened.

  *Please check off each item as completed.*

_____ _____

Company Signature

Telephone No. _____ Fax No. _____

# INSTRUCTIONS TO BIDDERS

1. GENERAL INFORMATION.

   The following instructions outline the procedure for preparing and submitting Bids. Bidders must fulfill all requirements as specified in these Documents.

2. TYPE OF BID.

   Bidders shall be required to submit prices for all items listed in the Bid Data Form.

3. PREPARATION OF BIDS.

   Bidders shall use only the Bid Data Form provided in these Documents. All blank spaces in the Bid Data Form, must be filled in, preferably in BLACK ink, in both words and figures where required. No changes to the wording or content of the forms is permitted. Written amounts shall govern in case of discrepancy between the amounts stated in writing and the amounts stated in figures.

   Prices stated shall be f.o.b. with freight and full insurance paid by Bidder, to the job site located in Grand Island.

   The Bidder shall acknowledge receipt of all addenda in the Bid Data Form. Bids received without acknowledgement or without the Addendum enclosed will be considered informal.

4. SUBMISSION OF BIDS.

   All Bids must be submitted intact not later than the time prescribed, at the place, and in the manner set forth in the ADVERTISEMENT FOR BIDS. Bids must be made on the Bid Data Form provided here in. Each Bid must be submitted intact in a sealed envelope, so marked as to indicate its contents without being opened, and delivered in person or addressed and mailed in conformance with the instructions in the ADVERTISEMENT FOR BIDS.

5. BID SECURITY.

   Bids must be accompanied by cash, a certified check, or cashier's check drawn on a bank which is insured by the Federal Deposit Insurance Corporation, or a bid bond issued by a Surety authorized to issue such bonds in the state where the Work is located, in the amount of 5 percent of the bid amount payable to OWNER. This bid security shall be given as a guarantee that the Bidder will not withdraw his Bid for a period of 30 days after bid opening, and that if awarded the Contract, the successful Bidder will execute the attached Contract and furnish a properly executed Performance Bond and Payment Bond each in the full amount of the Contract price within the time specified.

   The Attorney-in-Fact that executes this bond in behalf of the Surety must attach a notarized copy of his power of attorney as evidence of his authority to bind the Surety on the date of execution of the bond. Where State Statue requires, certification by a resident agent shall also be provided.

6. RETURN OF BID SECURITY.

   Within 15 days after the award of the Contract, the OWNER will return the bid securities to all Bidders whose Bids are not to be further considered in awarding the contract. All other retained bid securities will be held until the Contract has been finally executed, after which all bid securities, other than Bidders' bonds and guarantees which have been fortified, will be returned to the respective Bidders whose Bids they accompanied.

7. BASIS OF AWARD.

   The award will be made by the OWNER on the basis of the Bid from the lowest responsive, responsible Bidder which, in the OWNER's sole and absolute judgment will best serve the interest of the OWNER. All Bids will be considered on the following basis:

   | | |
   |---|---|
   | Conformance with the terms of the Bid Documents. | Bid price.<br>Cost of installation. |

Suitability to project requirements.
Delivery time.
Responsibility and qualification of Bidder.

The OWNER reserves the right to reject all Bids, or any Bid not in conformance with the intent of the Bid Documents, and to waive any informalities and irregularities in said Bids.

8. EXECUTION OF CONTRACT.

The successful Bidder shall, within 15 days after receiving notice of award, sign and deliver to the OWNER the Contract hereto attached together with the acceptable bonds if required in these Bid Documents. Within 15 days after receiving the signed Contract with acceptable bond(s) from the successful Bidder, the OWNER's authorized agent will sign the Contract. Signature by both parties constitutes execution of the Contract.

9. TIME OF COMPLETION.

The time of completion of the Work to be performed under this Contract is the essence of the Contract. The time allowed for the completion of the Work is stated in the Bid Data Form.

11. GRATUITIES AND KICKBACKS.

City Code states that it is unethical for any person to offer, give, or agree to give any City employee or former City employee, or for any City employee or former City employee to solicit, demand, accept, or agree to accept from another person, a gratuity or an offer of employment in connection with any decision, approval, disapproval, recommendation, or preparation of any part of a program requirement or a purchase request, influencing the content of any specification or procurement standard, rendering of advice, investigation, auditing, or in any other advisory capacity in any proceeding or application, request for ruling, determination, claim or controversy, or other particular matter, pertaining to any program requirement or a contract or subcontract, or to any solicitation or proposal therefor. It shall be unethical for any payment, gratuity, or offer of employment to be made by or on behalf of a subcontractor under a contract to the prime contractor or higher tier subcontractor or any person associated therewith, as an inducement for the award of a subcontract or order.

12. FISCAL YEAR.

The City of Grand Island, Nebraska operates on a fiscal year beginning October 1st and ending on the following September 30th. It is understood and agreed that any portion of this agreement which will be performed in a future fiscal year is contingent upon the City Council adopting budget statements and appropriations sufficient to fund such performance.

# CONTRACT AGREEMENT

THIS AGREEMENT made and entered into by and between **[SUCCESSFUL BIDDER]**, hereinafter called the Contractor, and the **CITY OF GRAND ISLAND, NEBRASKA**, hereinafter called the City.

WITNESSETH:

THAT, WHEREAS, in accordance with law, the City has caused contract documents to be prepared and an advertisement calling for bids to be published for *CIRCULATION WATER PUMP REPAIR;* and

WHEREAS, the City, in the manner prescribed by law, has publicly opened, examined, and canvassed the bids submitted, and has determined the aforesaid Contractor to be the lowest responsive and responsible bidder, and has duly awarded to the said Contractor a contract therefore, for the sum or sums named in the Contractor's bid, a copy thereof being attached to and made a part of this contract;

NOW, THEREFORE, in consideration of the compensation to be paid to the Contractor and of the mutual agreements herein contained, the parties have agreed and hereby agree, the City for itself and its successors, and the Contractor for itself, himself, or themselves, and its, his, or their successors, as follows:

ARTICLE I. That the following documents shall comprise the Contract, and shall together be referred to as the "Agreement" or the "Contract Documents";

1. This Contract Agreement.
2. City of Grand Island's Specification for this project.
3. [NAME OF SUCCESSFUL BIDDER] bid signed and dated [DATE OF BID].

In the event of any conflict between the terms of the Contract Documents, the provisions of the document first listed shall prevail.

ARTICLE II. That the contractor shall (a) furnish all tools, equipment, superintendence, transportation, and other construction materials, services and facilities; (b) furnish, as agent for the City, all materials, supplies and equipment specified and required to be incorporated in and form a permanent part of the completed work; (c) provide and perform all necessary labor; and (d) in a good substantial and workmanlike manner and in accordance with the requirements, stipulations, provisions, and conditions of the contract documents as listed in the attached General Specifications, said documents forming the contract and being as fully a part thereof as if repeated verbatim herein, perform, execute, construct and complete all work included in and covered by the City's official award of this contract to the said Contractor, such award being based on the acceptance by the City of the Contractor's bid;



ARTICLE III. That the City shall pay to the Contractor for the performance of the work embraced in this contract and the Contractor will accept as full compensation therefore the sum (subject to adjustment as provided by the contract) of **[DOLLAR AMOUNT] ($00.00)** for all services, materials, and work covered by and included in the contract award and designated in the foregoing Article II; payments thereof to be made in cash or its equivalent in the manner provided in the General Specifications.

The total cost of the Contract includes:

| | | |
|---|---|---|
| Base Bid: | $ | .00 |
| Sales Tax on Materials/Equipment: | $ | .00 |
| Sales Tax on Labor: | $ | .00 |
| Total | $ | .00 |

The City of Grand Island, Nebraska operates on a fiscal year beginning October 1st and ending on the following September 30th. It is understood and agreed that any portion of this agreement which will be performed in a future fiscal year is contingent upon the City Council adopting budget statements and appropriations sufficient to fund such performance.

ARTICLE IV. The Contractor hereby agrees to act as agent for the City in purchasing materials and supplies for the City for this project. The City shall be obligated to the vendor of the materials and supplies for the purchase price, but the Contractor shall handle all payments hereunder on behalf of the City. The vendor shall make demand or claim for payment of the purchase price from the City by submitting an invoice to the Contractor. Title to all materials and supplies purchased hereunder shall vest in the City directly from the vendor. Regardless of the method of payment, title shall vest immediately in the City. The Contractor shall not acquire title to any materials and supplies incorporated into the project. All invoices shall bear the Contractor's name as agent for the City. This paragraph will apply only to these materials and supplies actually incorporated into and becoming a part of the finished product of the CIRCULATION WATER PUMP REPAIR.

ARTICLE V. That the Contractor shall start work as soon as possible after the contract is signed and the required insurance is approved, and that the Contractor shall complete the work and deliver the materials F.O.B. Platte Generating Station on or before ***November 27, 2012.***

ARTICLE VI. The Contractor agrees to comply with all applicable State fair labor standards in the execution of this contract as required by Section 73-102, R.R.S. 1943. The Contractor further agrees to comply with the provisions of Section 48-657, R.R.S. 1943, pertaining to contributions to the Unemployment Compensation Fund of the State of Nebraska. During the performance of this contract, the Contractor and all subcontractors agree not to discriminate in hiring or any other employment practice on the basis, of race, color, religion, sex, national origin, age or disability. The Contractor agrees to comply with all applicable Local, State and Federal rules and regulations. The Contractor agrees to maintain a drug-free workplace policy and will provide a copy of the policy to the City upon request. Every public contractor and his, her or its subcontractors who are awarded a contract by the City for the physical performance of services within the State of Nebraska shall register with and use a federal immigration verification system to determine the work eligibility status of new employees physically performing services within the State of Nebraska.



GRATUITIES AND KICKBACKS

City Code states that it is unethical for any person to offer, give, or agree to give any City employee or former City employee, or for any City employee or former City employee to solicit, demand, accept, or agree to accept from another person, a gratuity or an offer of employment in connection with any decision, approval, disapproval, recommendation, or preparation of any part of a program requirement or a purchase request, influencing the content of any specification or procurement standard, rendering of advice, investigation, auditing, or in any other advisory capacity in any proceeding or application, request for ruling, determination, claim or controversy, or other particular matter, pertaining to any program requirement or a contract or

subcontract, or to any solicitation or proposal therefor. It shall be unethical for any payment, gratuity, or offer of employment to be made by or on behalf of a subcontractor under a contract to the prime contractor or higher tier subcontractor or any person associated therewith, as an inducement for the award of a subcontract or order.

**[SUCCESSFUL BIDDER]**

By_____ Date _____

Title_____

**CITY OF GRAND ISLAND, NEBRASKA**

By_____ Date _____
Mayor

Attest:_____
City Clerk

The contract is in due form according to law and hereby approved.

_____ Date _____
Attorney for the City

CITY OF GRAND ISLAND

*Working Together for a Better Tomorrow, Today.*

## REQUEST FOR BIDS - GENERAL SPECIFICATIONS

The Bid shall be in accordance with the following and with all attached BID DATA and DETAILED SPECIFICATIONS.

All prices are to be furnished and installed FOB, Grand Island, Nebraska. **All prices shall be firm, and shall include all sales and use taxes as lawfully assessed under laws and regulations of the State of Nebraska.** * If bidder fails to include sales tax in their bid price or takes exception to including sales tax in their bid price, the City will add a 7.0% figure to the bid price for evaluation purposes; however, the City will only pay actual sales tax due.

Bids shall include the following on the **outside** of the mailing envelope: **"Circulation Water Pump Repair".** All sealed bids are due no later than **Tuesday, October 30, 2012 at 2:30 p.m. local time**. Submit **an original and three copies** of the bid to:

Mailing Address: City Clerk
City Hall
P. O. Box 1968
Grand Island, NE 68802

Street Address: City Clerk
City Hall
100 E. First Street
Grand Island, NE 68801

Bids will be opened at this time in the City Hall Council Conference Room #1 located on 1st floor of City Hall. Any bid received after the specified date will not be considered. No verbal bid will be considered.

Bids will be evaluated by the Purchaser based on price, schedule, quality, adherence to schedule, plan and specifications, economy and efficiency of operation, experience and reputation of the bidder, ability, capacity, and skill of the bidder to perform contract required and adaptability of the particular items to the specific use intended.

The successful bidder will be required to comply with fair labor standards as required by Nebraska R.R.S.73-102 and comply with Nebraska R.R.S. 48-657 pertaining to contributions to the Unemployment Compensation Fund of the State of Nebraska. Contractor shall maintain a drug free workplace policy. Every public contractor and his, her or its subcontractors who are awarded a contract by the City for the physical performance of services within the State of Nebraska shall register with and use a federal immigration verification system to determine the work eligibility status of new employees physically performing services within the State of Nebraska.

The equipment and materials must be new, the latest make or model, unless otherwise specified. Prior to approving the invoice for payment, the City reserves the right to thoroughly inspect and test the equipment to confirm compliance with specifications. Any equipment or material which does not meet the City's requirements will be returned at vendor's expense for correction. The invoice will be paid after approval at the next regularly scheduled Council meeting and occurring after departmental approval of invoice; the City Council typically meets the second and fourth Tuesday of each month. Invoices must be received well in advance of Council date to allow evaluation and processing time.

Each bidder shall submit with the bid a certified check, a cashiers check, or bid bond payable to the City Treasurer in an amount no less than five percent (5%) of the bid price which shall guarantee good faith on the part of the bidder and the entering into a contract within fourteen (14) days at the bid price if accepted by the City. **Your certified check, cashier's check or bid bond must be submitted in a separate envelope attached to the outside of the envelope containing the bid. Each envelope must be clearly marked indicating its contents. Failure to submit the necessary qualifying information in clearly marked and separate envelopes will result in your bid not being opened or considered.** Surety companies authorized to do business in the State of Nebraska must issue bid bonds.

Successful bidder shall comply with the City's insurance requirements. All bids shall be valid for at least thirty (30) working days after the bid deadline for evaluation purposes.

**All bids must be on the bid form and must be signed and dated to be accepted**. Please contact Lynn Mayhew at 308-385-5495, for questions concerning this specification.

# Circulation Water Pump Repair

## Detailed Specifications

SCOPE: The Contractor shall furnish all engineering, equipment, labor, and material necessary to make repairs as described in the inspection of Circulation pump B.

DESCRIPTION: The Platte Generating Station is located at 1035 W. Wildwood Drive, Grand Island, Nebraska. The circulating pump is a Byron Jackson type 42 VX one-stage Vertical Circulator (VCT) pump, Serial Number 781-C-0413. The pump is self-lubricated and configured for above-foundation discharge. The pump was placed into service in 1981.

PUMP INSPECTION: The pump was inspected on October 10, 2012 by:

Rotating Equipment Repair, Inc.
W248 N5550 Executive Drive
Sussex, WI 53089

Phone: (262) 820-2525
Fax: (262) 820-2233
Email: cpd@rerpump.com

The inspection report is attached and all repairs indicated in the inspection shall be bid. The pump is available for inspection at Rotating Equipment Repair.

Contractor to include the cost of preparing the pump for shipment and shipment to the Platte Generating Station

SUBMITTALS: If alternative methods for repairs are advised, these repairs shall be bid as an alternate.

MATERIALS, EQUIPMENT, AND SERVICES PROVIDED BY THE CONTRACTOR: The Contractor shall provide all required hand tools, hoists, scaffolding, consumables, and all other equipment and materials necessary to completely perform the work.

GUARANTEE/WARRANTY: The Contractor shall warranty the equipment to be free from defects (in materials or workmanship) for a period of one year from the date the equipment is placed in service at Platte Generating Station. If during the warranty period, a defect or failure is determined or incurred, the Contractor shall repair the equipment at its expense, including all transportation related expenses.

SCHEDULE: The Contractor shall include a schedule with the bid and a proposed completion date.

QUALIFICATIONS: The Contractor shall be a firm specializing in pump repair in industrial locations. Reference contacts of at least three recent projects of similar scope shall be furnished with the bid.

SERVICE RATES: The Bid shall include with the bid a firm unit price, including expenses, and all other standard terms and conditions which will be in effect during the project. The Bid shall also include firm unit pricing for adjustments that may be required for work outside of the specified scope of services.

**The Platte Generating Station is NOT tax exempt and is subject to 7.0% sales tax. See the Nebraska Department of Revenue web site at www.revenue.state.ne.us for contractors' tax information.**

ATTACHMENTS:

- Pump Disassembly Procedure
- Pump Test Curve
- Pump Sectional Drawing 1F-8486
- Pump Outline 2C-5652
- Torquing Instructions GS-1507
- Rotating Equipment Repair Inspection Report

EVALUATION: Bids are to be evaluated on lowest firm price and time to complete repairs. All repairs are to be complete and pump shipped back to Platte Generating Station by November 27th, based on contract awarded at council meeting on November 7th and executed contract.

CONTACT: Questions regarding this specification may be directed to Lynn Mayhew or Mike Steinke at the Platte Generating Station, telephone (308) 385-5492.

INSURANCE: The Contractor shall comply with the attached City's Insurance Requirements.

**MINIMUM INSURANCE REQUIREMENTS**
**CITY OF GRAND ISLAND, NEBRASKA**

The successful bidder shall obtain insurance from companies authorized to do business in Nebraska of such types and in such amounts as may be necessary to protect the bidder and the interests of the City against hazards or risks of loss as hereinafter specified. This insurance shall cover all aspects of the Bidder's operations and completed operations. Failure to maintain adequate coverage shall not relieve bidder of any contractual responsibility or obligation. Minimum insurance coverage shall be the amounts stated herein or the amounts required by applicable law, whichever are greater.

**1. WORKERS COMPENSATION AND EMPLOYER'S LIABILITY**

This insurance shall protect the Bidder against all claims under applicable State workers compensation laws. This insurance shall provide coverage in every state in which work for this project might be conducted. The liability limits shall not be less than the following:

| | |
|---|---|
| Workers Compensation | Statutory Limits |
| Employers Liability | $100,000 each accident |
| | $100,000 each employee |
| | $500,000 policy limit |

**2. BUSINESS AUTOMOBILE LIABILITY**

This insurance shall be written in comprehensive form and shall protect the Bidder, Bidder's employees, or subcontractors from claims due to the ownership, maintenance, or use of a motor vehicle. The liability limits shall be not less than the following:

| | |
|---|---|
| Bodily Injury & Property Damage | $ 500,000 Combined Single Limit |

**3. COMPREHENSIVE GENERAL LIABILITY**

The comprehensive general liability coverage shall contain no exclusion relative to explosion, collapse, or underground property. The liability limits shall be not less than the following:

| | |
|---|---|
| Bodily Injury & Property Damage | $ 500,000 each occurrence |
| | $1,000,000 aggregate |

**4. UMBRELLA LIABILITY INSURANCE**

This insurance shall protect the Bidder against claims in excess of the limits provided under employer's liability, comprehensive automobile liability, and commercial general liability policies. The umbrella policy shall follow the form of the primary insurance, including the application of the primary limits. The liability limits shall not be less than the following:

| | |
|---|---|
| Bodily Injury & Property Damage | $1,000,000 each occurrence |
| | $1,000,000 general aggregate |

**5. ADDITIONAL REQUIREMENTS**

The City may require insurance covering a Bidder or subcontractor more or less than the standard requirements set forth herein depending upon the character and extent of the work to be performed by such Bidder or subcontractor.

Insurance as herein required shall be maintained in force until the City releases the Bidder of all obligations under the Contract.

The Bidder shall provide and carry any additional insurance as may be required by special provisions of these specifications.

**6. CERTIFICATE OF INSURANCE**

Satisfactory certificates of insurance shall be filed with the City prior to starting any work on this Contract**. The certificates shall show the City as an additional insured on all coverage except Workers Compensation. The certificate shall state that thirty (30) days written notice shall be given to the City before any policy is cancelled (strike the "endeavor to" wording often shown on certificate forms). If the bidder cannot have the "endeavor to" language stricken, the bidder may elect to provide a new certificate of insurance every 30 days during the contract. Bidder shall immediately notify the City if there is any reduction of coverage because of revised limits or claims paid which affect the aggregate of any policy.**

## 5.4 PUMP DISASSEMBLY

The pump may be disassembled using either of two basic methods. In the procedure outlined below, which is recommended for this pump, the pump assembly (without the driver) is removed from the pit as a unit and placed horizontally on suitable supports for disassembly. An alternative method is to remove the pump from the pit a section at a time, with I-beams or other suitable supports placed across the foundation opening to support the unit during the disassembly process.

Although the disassembly procedure given below describes the horizontal method of disassembly, the basic sequence of operations for vertical disassembly will be essentially the same. However, when disassembling the pump vertically, be sure that the support beams used are secured to prevent them from spreading laterally under the load, and use care when removing the discharge head to avoid tilting and possible bearing damage. Also, note that the top end of the head shaft is threaded to receive a lifting eye bolt.

### 5.4.1 General Disassembly Procedure

1. Follow Stopping Procedure, Paragraph 4.5, and disconnect driver leads from power source.

2. Disconnect any auxiliary piping and wiring that would interfere with disassembly.

3. Disassemble the shaft seal as described in Paragraph 2.2.1.

4. Remove cap screws to disconnect the driver-to-pump coupling.

5. Detach and remove the driver.

6. Remove the adjusting plate (532), pump half coupling (530) and two pump half coupling keys (676-3).

7. Disconnect the main discharge piping at the discharge head (465) output flange.

8. Disconnect the discharge head (465) from the sole plate (429).

9. Using lifting lugs on discharge head, lift the pump assembly from the pit and place the pump assembly horizontally on suitable supports.

   NOTE: To protect the pump bearings and to ease disassembly, the unit should be placed as level as possible, with all parts including shafts supported adequately at all times.

10. Remove Spirolox ring (334) and gib key (678) and slide shaft sleeve (217) off head shaft (404).

11. Disconnect the discharge head (465) from the column (422) and carefully remove the discharge head over the head shaft (404) while providing shaft support at all times to prevent possible damage to the throttle bushing (232).

12. If removal of the stuffing box bearing (233) is required, place the discharge head in operating position on wood block supports to disconnect and remove the stuffing box (050) and O-ring (747-2), then disassemble the bearing from the stuffing box.

13. Disconnect the column (422) from the top case (076), support the head shaft (404) as required to protect the column bearing (383), and slide the column about 2 or 3 feet up the head shaft. Then disconnect and remove the shaft coupling parts and carefully remove the head shaft from the column.

14. Disassemble the pump bowl assembly as directed in the following paragraph.

5.4.2 Disassembly of Pump Bowl Assembly

1. Place the pump bowl assembly to rest in operating position on wood block supports placed under the suction bell (086).

2. Detach top case (076) from impeller case (077) and carefully lift off top case over pump shaft (167).

3. Thread lifting eye bolt into upper end of pump shaft (167) and attach lifting line, then lift pump shaft and attached impeller (176) from the assembled impeller case (077) and suction bell (086).

4. To remove the impeller from the pump shaft (if necessary), remove in sequence the thrust collar cap screws, thrust collar (226), split ring (256-1), impeller and key (676-1). Heating of the impeller should not be necessary.

5.5 CLEANING AND INSPECTION

1. Discard all gaskets and O-rings removed during disassembly.

2. Discard all used rings of packing.

3. Solvent wash and use clean, dry, filtered compressed air to dry all remaining components. Clean, lint free cloths may augment or substitute for the compressed air.

4. When parts are dry, inspect each part for wear, erosion or corrosion. Discard and provide replacements for any parts worn, eroded, corroded or otherwise damaged sufficiently to impair operation.

5. Refer to Paragraph 5.5.1 for diametral running clearance specifications. Discard and replace all parts not meeting these specifications. Wear ring clearance can be restored by installing original or oversized wear rings and, if necessary, turning down to size.

6. Repeat the cleaning and drying procedure of Step 3 for all original and replacement parts to be reassembled.

5.5.1 Diametral Running Clearances

The following diametral running clearances are factory tolerances for a new or rebuilt pump. For maintenance purposes, it is recommended that pump running clearances not be allowed to exceed 150% of the maximum values given.

| From | To | Clearance |
|---|---|---|
| Pump Shaft (167) | Bottom Bearing (103) | .010-.015" |
| Pump Shaft (167) | Top Case Bearing (397) | .010-.015" |
| Head Shaft (404) | Column Bearing (383) | .010-.013" |
| Head Shaft (404) | Stuffing Box Bearing (233) | .011-.014" |
| Wear Ring (202) | Wear Ring (205) | .025-.029" |

5.6 PUMP REASSEMBLY

Assemble the pump bowl assembly, if disassembled, as directed in Paragraph 5.6.1. Complete the pump assembly and installation as described in Paragraph 5.6.2. Torque all nuts and bolts per Torquing Instructions (GS-1507) contained in Section Seven, noting that fasteners for this pump are Category II.

5.6.1 Reassembly of Pump Bowl Assembly

1. Replace any bearings (103, 397) or wear rings (202, 205) that may have been removed, and be sure all retaining screws are securely tightened.

2. Place impeller key (676-1) in its pump shaft (167) groove, slide impeller (176) up onto shaft past split ring groove, place split ring (256-1) in position and slide impeller down to seat against the split ring. Assemble the thrust collar (226) into place and secure to impeller using socket head cap screws with lockwashers.

NOTE: Lubrication of the pump shaft is recommended to ease installation of the impeller. When installing impeller on shaft, heating should not be required. However, if impeller is heated, do not exceed 200°F. Use a neutral acetylene flame, heat the impeller evenly from the bore outward, and use a pipe sleeve or dampened cloth to keep the flame away from the shaft.

3. If disassembled, reassemble impeller case (077) to suction bell (086) and assemble and torque retaining cap screws, lockwashers and nuts. Place assembled suction bell and impeller case in operating position on wood block supports.

4. Using a lifting eye bolt in pump shaft, carefully raise and lower assembled pump shaft and impeller into assembled impeller case and suction bell.

5. Lift and carefully install top case (076) over the pump shaft to mate with impeller case (077), then assemble and torque the lockwashers and stud nuts.

6. Lift or lay the pump bowl assembly on its side to grease the bottom bearing (103). Remove pipe plug from suction bell bearing housing and install a grease fitting. Using Chevron Moly Grease, Grade 2, or equal, pack the bottom bearing until grease emerges near the thrust collar (226). Then remove the grease fitting and install pipe plug in the suction bell bearing housing.

7. Complete the pump assembly as directed in the next paragraph.

5.6.2 Reassembly of Pump

The following instructions describe reassembly of the pump in a horizontal position, which is the recommended method for this pump. After assembly, the completed pump (without driver) is lifted vertically for installation as a unit.

As an alternative assembly method, the pump can be assembled at the foundation a section at a time as installation proceeds, with I-beams or other suitable supports placed across the foundation opening to support the incompleted unit. In this case, the sequence of operations will be essentially the same as for horizontal assembly; however, when assembling the pump vertically, be sure the support beams used are secured laterally to prevent them from spreading under the load. In addition, when installing the discharge head, use care to avoid tilting and possible damage to the stuffing box bearing. (To avoid this possibility, it is recommended that the stuffing box be removed from the discharge head until after the discharge head is installed.) Also, note that the top end of the head shaft is tapped to receive a lifting eye bolt for vertical handling.

After assembly of the pump bowl assembly (Paragraph 5.6.1), complete the assembly of the pump as follows:

1. Place the pump bowl assembly horizontally as level as possible on wood block supports. Position the assembly to allow approximately 30 feet of working floor space beyond the end of the pump shaft.

2. If removed, reinstall the column bearing (383) in the column (422). Be sure that the bearing retaining screws are securely tightened.

3. Place the column (422) horizontally on wood block supports, correctly aligned with the bowl assembly and about 3 or 4 feet away from the pump top case (076).

4. While providing shaft support at all times and using care to avoid damaging the column bearing (383), slide head shaft (404) into the column through the column bearing, then install coupling parts and assemble the head shaft to the pump shaft (167). With the coupling nuts (255) threaded up tightly, remove set screws (795) and drill small holes in the shafts, on screw centerline, large enough for dog point, then replace the set screws and secure tightly.

5. While continuing to support the head shaft (404) independently to prevent possible bearing damage, slide the column (422) to mate with the pump top case (076), and install and torque the retaining cap screws, lockwashers and nuts.

NOTE: The following step may be performed either with or without the stuffing box (050) installed in the discharge head (465).

6. Carefully install the discharge head to mate with the column (422), using care to guide the head shaft (404) safely through the stuffing box bearing (233), if it is installed. Assemble and torque the retaining cap screws, lockwashers and nuts.

7. Thoroughly clean the top surface of the sole plate (429), removing all dirt, burrs and roughness that could interfere with proper placement of the discharge head.

8. Lift and install the pump assembly onto the sole plate (429) and install and fasten the head-to-plate stud nuts.

9. If not done previously, install the stuffing box bearing (233) in the stuffing box (050) and secure with cap screws and lockwashers; then install O-ring (747-2) and stuffing box to the discharge head (465) and secure with stud nuts and lockwashers.

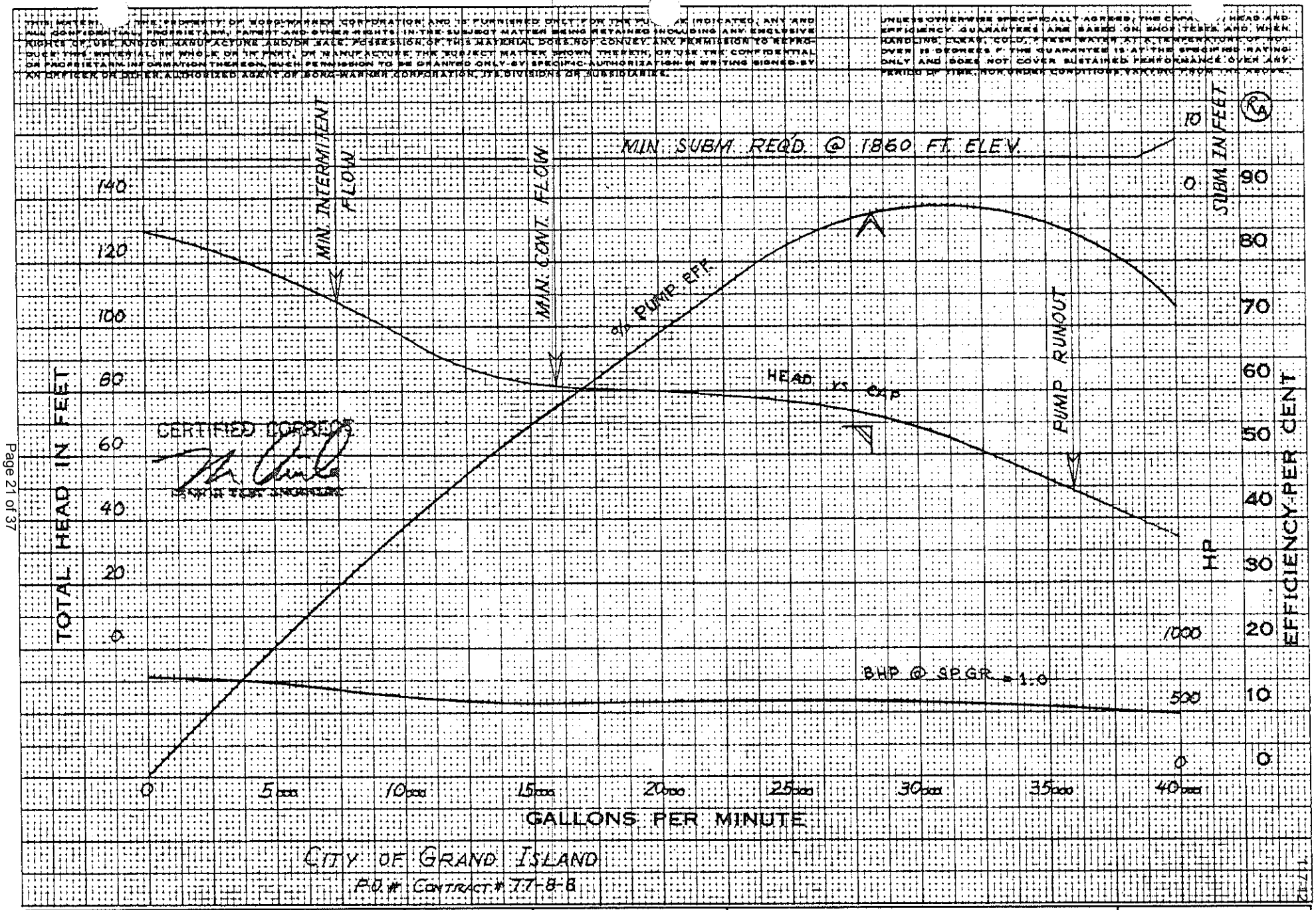
10. Install sleeve O-ring (747-1), shaft sleeve (217), gib key (678) and Spirolox ring (334) on head shaft (404).

11. Complete the pump installation as directed in the applicable portions of Paragraph 3.9 thru 3.15.

# BYRON JACKSON








CERTIFIED CORRECT

CITY OF GRAND ISLAND

P.O.# CONTRACT # 77-8-6

| PUMP SIZE AND TYPE | RPM | ASSEMBLY NO. | IMPELLER NO. / DIA | FILED TO | BYRON JACKSON TEST |
|---|---|---|---|---|---|
| 42 VX - 1 STG VC | 705 | FACTORY NO. 781-C-0413 | R-3970 23 1/8 x 33 1/2 "L UNDER / OVER | 1/2 x 4 | T— 38294 REV. A 8 JUNE 81 |
| | | DATE 12 MAR 80 | DATA BY PAL | DRAWN BY PAL | |

BORG WARNER

Byron Jackson Pump Division
BORG-WARNER CORPORATION

# PUMP TEST DATA

PUMP SIZE AND TYPE: 42 VX 1 STG VC

| IMPELLER DRAWING | DIAMETER | VANES | OVER / UNDER FILES TO | STGS. |
|---|---|---|---|---|
| R-3970 | 23 1/8 X | 4 | 1/2 X 4 | 1 |
| | 33 1/2" L | | | |

GUARANTEED PUMPING CONDITIONS

| | R.P.M. | G.P.M. | T.D. HEAD | PUMP EFF. | OVERALL EFF. | NPSH. | SP. GR. |
|---|---|---|---|---|---|---|---|
| FIELD SPEED | 705 | 28250 | 69.1 | 87.5 | | 6'R | 1.0 |
| TEST SPEED | | | | | | | |

DIFF. VEL. HD. BETWEEN GAUGES AT 42 I. D. DISCH. AND I. D. SUCT. = .083 FT AT 10,000 G.P.M.

MOTOR NO. CUST. 700 H.P. 10 POLES 4000 VOLTS

MOTOR EFF. 3/4 4/4 3/4 1/2 1/4

BAROMETRIC PRESSURE — IN. HG.

TESTED BY- PAL FOR B. J.

WITNESSED BY-

FOR. CITY OF GRAND ISLAND

CUSTOMER'S ORDER NO.- CONTRACT # 77-8-8

ITEM NO.- JOB NO.- 781-C-0413

NOTES-

MOTOR SERIAL # 1-5117-11646-1-2

| READING NO. | SUCT. HD. GAUGE READ | SUCT. HD. GAUGE CORR. | DISCHARGE HEAD GAUGE Hg COL. FT READ | DISCHARGE HEAD GAUGE Hg COL. CORRECTED | FEET OF WATER | ELEVATION HEAD | DIFFERENTIAL VELOCITY HEAD | TOTAL DYNAMIC HEAD IN FEET OF WATER | CAPACITY MEASURED WITH 36 x 24 VENTURI READ | CAPACITY G.P.M. | WATER HORSE POWER | BRAKE HORSE POWER | WATT METER READING 2145 | EQUIV. H.P. INPUT | VOLTS X40 | AMPS X40 | PUMP EFFICIENCY | | WATER TEMP. °F | PUMP SPEED RPM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | 2.15 | | 29.3 | 3.7 | 1.3 | 34.3 | 4.35 | 40,000 | 346.5 | 474.8 | .233 | 499.8 | 105.1 | 1.87 | 73.0 | | 62 | 716 |
| 2 | | | 4.00 | | 54.6 | | .9 | 59.2 | 3.05 | 33,000 | 493.3 | 560.4 | .275 | 589.9 | | 2.07 | 88.0 | | | 716 |
| 3 | | | 4.96 | | 67.7 | | .7 | 72.1 | 2.26 | 28,500 | 518.9 | 588.9 | .289 | 619.9 | | 2.14 | 88.1 | | | 715 |
| 4 | | | 5.42 | | 74.0 | | .4 | 78.1 | 1.39 | 22,500 | 443.8 | 584.8 | .287 | 615.6 | | 2.12 | 75.9 | | | 715 |
| 5 | | | 5.63 | | 76.8 | | .2 | 80.7 | .73 | 16,000 | 326.1 | 564.5 | .277 | 594.2 | | 2.08 | 57.8 | | | 715 |
| 6 | | | 6.71 | | 91.6 | | .1 | 95.4 | .33 | 10,500 | 253.0 | 623.6 | .306 | 656.4 | | 2.22 | 40.6 | | | 714 |
| 7 | | | 7.95 | | 108.5 | | 0 | 112.2 | .14 | 6,500 | 184.2 | 701.0 | .344 | 737.9 | | 2.42 | 26.3 | | - | 714 |
| 8 | | | 9.24 | | 126.1 | | 0 | 129.8 | 0 | 0 | 0 | 778.4 | .382 | 819.4 | | 2.66 | 0 | | | 714 |
| 9 | | | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | | | | | |



DATE OF TEST: 12 MARCH 80

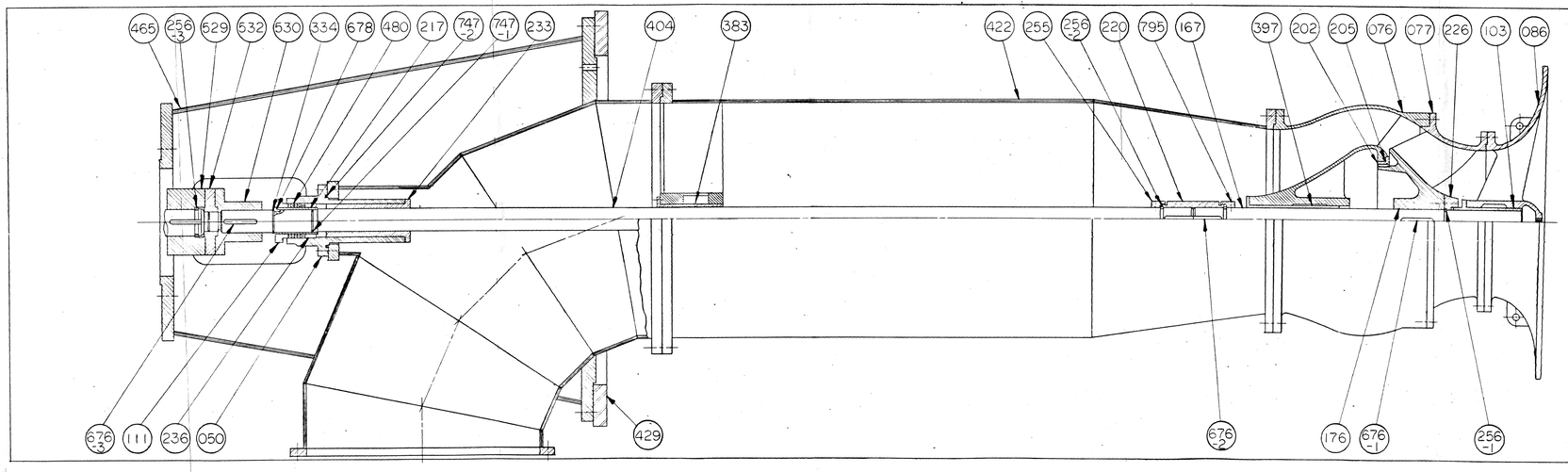
PUMP SERIAL No. 781-C-0413

T- 38294

P-366 7/75

| REF. NO | QTY | DESCRIPTION | MATERIAL |
|---|---|---|---|
| 050 | 1 | Stuffing Box | ASTM A-48, Cl. 30 |
| 076 | 1 | Top Case | ASTM A-48, Cl. 30 |
| 077 | 1 | Impeller Case | ASTM A-48, Cl. 30 |
| 086 | 1 | Suction Bell | ASTM A-48, Cl. 30 |
| 103 | 1 | Bottom Bearing | ASTM B-584, UNS No. C93200 |
| A 111 | 1 | Split Gland | ASTM B-584, UNS No. C83600 |
| 167 | 1 | Pump Shaft | ASTM A-276, Type 410 H.T. |
| 176 | 1 | Impeller | ASTM B-148, UNS No. C95200 |
| A 202 | 1 | Wear Ring-Impeller | ASTM B-148, UNS No. C95200 |
| 205 | 1 | Wear Ring-Case | ASTM B-148, UNS No. C95500 |
| 217 | 1 | Shaft Sleeve | ASTM A-296, Gr. CA-15 |
| 220 | | Coupling Sleeve | ASTM A-296, Gr. CA-15 |
| 226 | 1 | Thrust Collar | ASTM B-584, UNS No. C83600 |
| A 233 | 1 | Stuffing Box Bearing | ASTM B-584, UNS No. C93200 |
| 236 | 1 | Cage Ring | ASTM B-584, UNS No. C93200 |
| 255 | 2 | Nut-Coupling Sleeve | ASTM A-336, Gr.F6 |
| 256-1 | 1 | Split Ring | ASTM A-276, Type 410 H.T. |
| 256-2 | 2 | Split Ring | ASTM A-276, Type 410 H.T. |
| 256-3 | 1 | Split Ring | ASTM A-276, Type 410 H.T. |
| 334 | 1 | Spir-O-Lox Ring | AISI Tp. 302 |
| A 383 | 1 | Column Bearing | ASTM B-584, UNS No. C93200 |
| 397 | 1 | Top Case Bearing | ASTM B-584, UNS No. C93200 |
| 404 | 1 | Head Shaft | ASTM A-276, Type 410 H.T. |
| 422 | 1 | Column-Outer | ASTM A-516, Gr. 60 |
| 429 | 1 | Sole Plate | ASTM A-283, Gr. C |
| 465 | 1 | Discharge Head | ASTM A-516, Gr. 60 |
| 480 | 4 | Packing Ring | J.C. 100M |
| 529 | 1 | Codpling-Drive Half | ASTM A-576, UNS No. G10180 Park |
| A 530 | 1 | Coupling-Pump Half | ASTM A-576, UNS No. G10180 Park |
| 532 | 1 | Adjusting Plate | ASTM A-576, UNS No. G10180 Park |
| 676-1 | 1 | Key-Impeller | ASTM A-582, Type 416 H.T. |
| 676-2 | 4 | Key-Shaft Coupling | ASTM A-582, Type 416 H.T. |
| 676-3 | 2 | Key-Pump Half Coupling | ASTM A-582, Type 416 H.T. |
| 678 | 1 | Gib Key | ASTM A-581, Type 416 H.T. |
| 747-1 | 1 | "O" Ring-Packing Sleeve | Nitrile Buna-N |
| 747-2 | 1 | "O" Ring- Stuffing Box | Nitrile Buna-N |
| B 795 | 2 | Set Screw-Coupling Nut | 18-8 S.S. |

NOTE: ASTM MATERIAL CALL OUT FOR REFERENCE ONLY.




| LTR | REV. BY | DESCRIPTION | DATE | CHK'D | APPROVED |
|---|---|---|---|---|---|
| 0 | | ORIG DRWG | | | |
| A | RSP | PARTS LIST REV. | 29 OCT 79 | | |
| B | FRY | INNER COLUMN REMOVED | 11-79 | | |

# GRAND ISLAND 77-8

LUTZ, DAILY & BRAIN
Consulting Engineers
SHAWNEE MISSION, KANSAS

| | DATE | BY |
|---|---|---|
| PRINTS ☆ | 12-1-79 | RSB |
| PRINTS RELEASED | | |
| LICENSED AND CERTIFIED | | |

☆ Approval for fabrication with exceptions noted. Plans and Specifications. Approval does not relieve you from your part of contract or guarantee detailed quantities or dimensions.

JUL 30 1979

CITY OF GRAND ISLAND NEBRASKA
CIRCULATING WATER PUMPS
LUTZ, DAILY & BRAIN SPEC. 77-8-8
P.O. NO. 77-8-8

MICROFILMED
MAR [illegible]

T.R.D. CLASSIFICATION

| | |
|---|---|
| BI ORDER NO. | 21-C-0412 |
| DRAWN BY | Y. GRIFFITH |
| CHECKED BY | |
| DESIGN APPD BY | |
| TITLE | |
| CUSTOMER APP'D | |
| REF. NO. | |
| DATE | 14 AUG 78 |
| DATE | 29 OCT 79 |
| DATE | |

BORG-WARNER — Byron Jackson Pump Division
BORG-WARNER CORPORATION
LOS ANGELES DIVISION

DRAWING TITLE: 42 VX 1-STAGE

CONTRACT NO.

| CODE IDENT. NO. | DRAWING NO. | REV. |
|---|---|---|
| | IF-8486 | B |

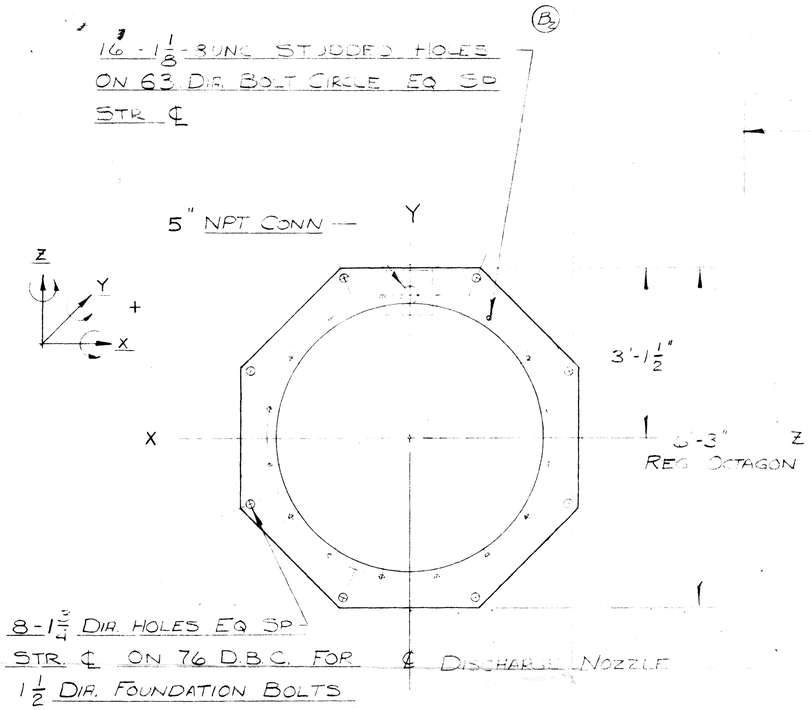
SCALE | WEIGHT | SHEET

DEC 13 1979

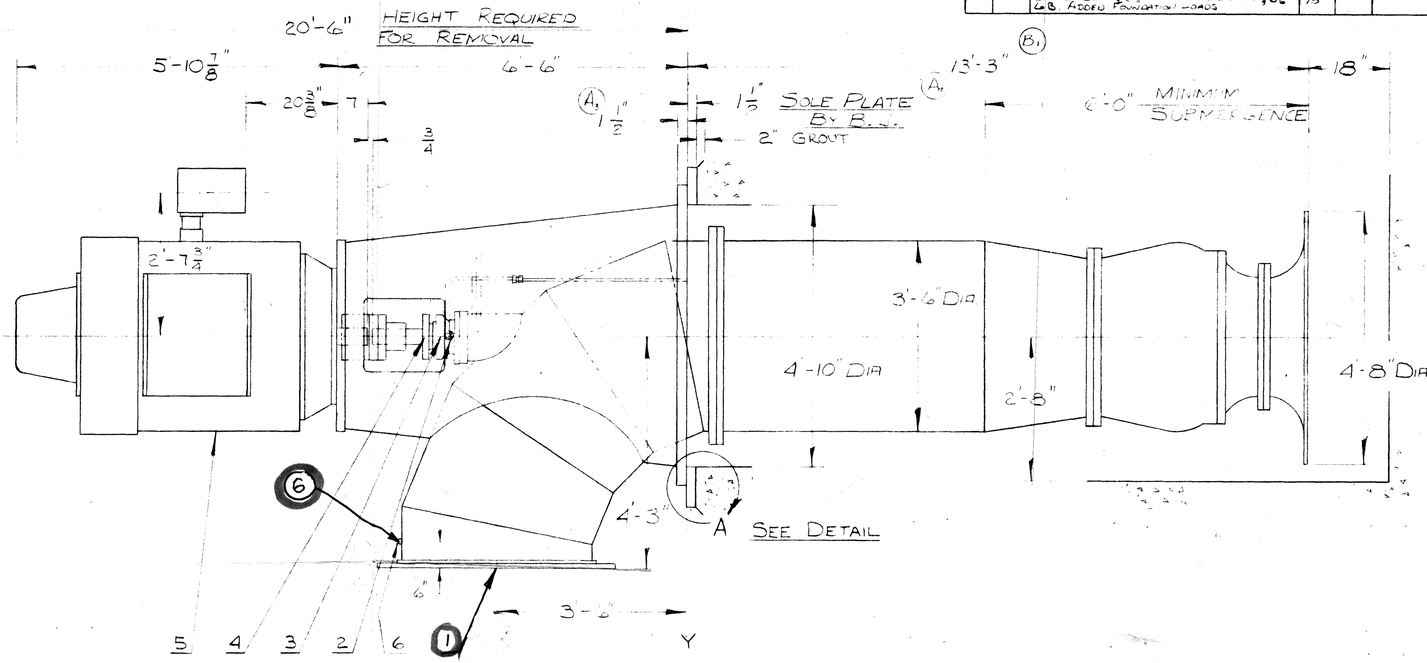
117-03

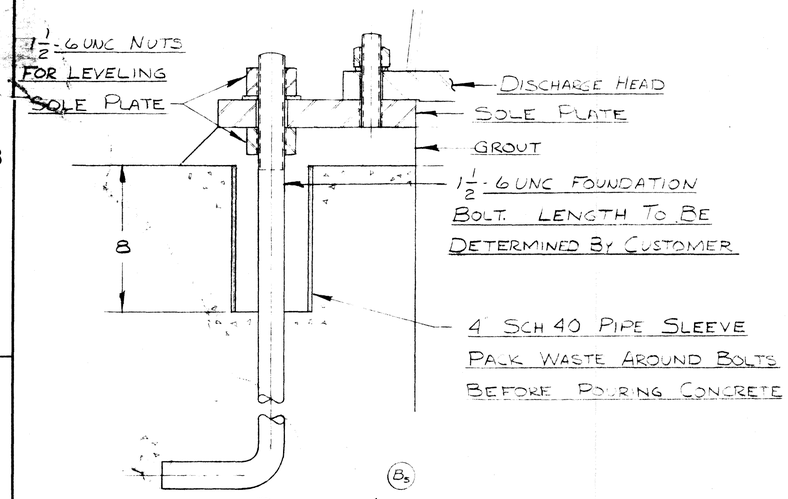
| REVISIONS | | | | | | | |
|---|---|---|---|---|---|---|---|
| LTR | REV. BY | DESCRIPTION | DATE | CHK'D | APPROVED MET | APPROVED ENG | APPROVED QA |
| C | RSP | B4, REMOVE INJECTOR REQ. | 18 JUN 79 | | | | |

| REVISIONS | | | | | |
|---|---|---|---|---|---|
| LTR | REV. BY | DESCRIPTION | DATE | CHK'D | APPROVED |
| Ø | | ORIG DRWG. | | | |
| A | RSP | A1-5A ADD PLATE(S) TO SP. NOTE; A1-3D ADDED STR ℄ ; A2-4C ADDED TEXT | 3 OCT 78 | | |
| B | RSP | B1-2D DIM. WAS 11-6 ; B2-7D ADD DISCH. HD DRILL PATTERN ; B3-4H WEIGHT FOR PUMP WAS 14,000 LBS ; B4-2B ADDED GAGE CONN. ; B5-6B ADDED FOUNDATION LOADS | 3 NOV 79 | | |




SOLE PLATE




DETAIL A

APPROXIMATE WEIGHTS:

| | |
|---|---|
| PUMP LESS MOTOR | 15,000 LBS |
| MOTOR | 8900 LBS |
| TOTAL | 23,900 LBS |

(B3)

| FOUNDATION LOADS | | |
|---|---|---|
| | FORCE - LBS | MOMENT - IN-LBS |
| X-DIR. | — | $-3.159 \times 10^{+6}$ |
| Y-DIR | 75,210 | — |
| Z-DIR. | -35,000 | $-6.255 \times 10^{+4}$ |

FORCES AND MOMENTS TRANSLATED TO THE TOP OF THE SOLE PLATE.

(A) CITY OF GRAND ISLAND, NEBRASKA
PLATTE GENERATING STATION - UNIT No. 1
CIRCULATING WATER PUMPS
LUTZ, DAILY & BRAIN SPEC 77-8-8
P.O. No. 77-8-8

(1) 42" O.D. PIPE FLANGE - TAYLOR FOR E CLASS 125 LW, 53 O.D., 1 1/4 THICK FLAT FACE, 36 - 1 5/8 DIA HOLES ON 49 1/2 D.B.C.

(2) STUFFING BOX CONNECTION - 1/2 NPT RECIRCULATING LINE E.J. TO PIPE

3. CAGE RING CONNECTION - 1/2 NPT PLUGGED, BACKSIDE.

4. SPLIT GLAND CONNECTION - 1/2 NPT

5. SIEMENS-ALLIS SQUIRREL CAGE INDUCTION MOTOR, FRAME 3023 TYPE FODV W.P. II 700 HP., 720 RPM, 4000 VOLTS, 3 PH 60 Hz.

(6) GAGE CONNECTION - 1/2 NPT HALF COUPLING ON ℄

**GRAND ISLAND 77-8**

LUTZ, DAILY & BRAIN
Consulting Engineers
SHAWNEE MISSION, KANSAS

| | DATE | BY |
|---|---|---|
| ☐ APPROVED ★ APPROVED AS NOTED ☐ RETURNED FOR CORRECTION | 12-11-79 | RBB |

★ Approved for Compliance with Engineers Plans and Specifications. Approval does not void any part of contract or guarantee detailed quantities or dimensions.

JUL 30 1979

T.N.O. CLASSIFICATION

| DISTRIBUTION | ARG. | AUST. | CAN. | HOL. | JAPAN | L.A. | MEX. | TULSA | ORIGINATOR: |
|---|---|---|---|---|---|---|---|---|---|
| DATE | | | | | | | | | |

ALL LIMITS OF CONCENTRICITY AND SQUARENESS OF FACES SUBJECT TO BYRON JACKSON INSPECTION STANDARDS PER E. M. SECTION 02-11.
UNLESS TOLERANCE IS GIVEN MACHINE TO WITHIN

| DIAMETERS | LENGTH |
|---|---|
| BORE + 1/64 | 0 TO 2 FT. — 1/64 |
| TURN — 1/64 | 2 TO 6 FT. — 1/32 |
| | 6 FT. AND OVER — 1/16 |



UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS .XX ± .XXX ± .XXXX ±
ANGLES ±
√ SURFACE ROUGHNESS PER MIL STD - 10
DRILLED HOLES V AS DRILLED
TAPPED HOLES V AS TAPPED
DO NOT SCALE DRAWING.
REMOVE ALL BURRS AND SHARP EDGES EQUIVALENT TO .005/.015
ALL MACHINED CORNERS OR FILLETS .005/.020

| | | |
|---|---|---|
| BJ ORDER NO. | 781-C-0412 | REF. NO. |
| DRAWN BY | R PATERSON | DATE 17 Aug 78 |
| CHECKED BY | | DATE |
| DESIGN APP'D BY | | DATE |
| TITLE | | |
| CUSTOMER APP'R | | |

BORG-WARNER® BYRON JACKSON®
BORG-WARNER CORPORATION

DRAWING TITLE: PUMP OUTLINE
42 VX 1 STG VERT. CIRC.

CONTRACT NO.

| CODE IDENT. NO. | DRAWING NO. | REV. |
|---|---|---|
| | 2C-5652 | C |

SCALE 3/8" = 1' | WEIGHT | SHEET

DEC 13 1979

117-02
7-30-79

117-02

# BOLT TORQUING PROCEDURE FOR VERTICAL COMMERCIAL PUMPS

## 1.0 SCOPE

This procedure specifies the bolt torquing method and torque values to be used for pump assembly.

## 2.0 APPLICATION

2.1 In general this procedure applies to bolting at the following joints: case to case, case to column, column to column, column to discharge head, head to barrel, head to sole plate, foundation bolts, seal flange, stuffing box, drive coupling and any other major bolting.

2.2 All external bolting on sub-assemblies or pumps shipped assembled, must be retorqued to specified values before installation.

## 3.0 THREAD LUBRICANT

Thread lubricant shall be Dag Dispersion No. 156 or equal. ($\mu$= 0.15)

WARNING: Specified torque values in this procedure are dependent upon strict adherence to lubrication and cleaning procedures specified herein.

## 4.0 INSPECTION, CLEANING AND LUBRICATION

4.1 All threads shall be examined to insure that there are no incompletely cut threads, burrs, nicks or metallic slivers. Discard or upgrade any bolting which does not pass visual inspection.

4.2 Solvent shall be used to clean all mating surfaces of the fasteners to insure foreign matter, grease, corrosion rust, and previous lubricant is removed.

4.3 Mix or agitate thread lubricant well before using. Apply a uniform layer of lubricant to all surfaces which experience relative motion including threads, nuts, washers, and flange.

## 5.0 BOLT TORQUING

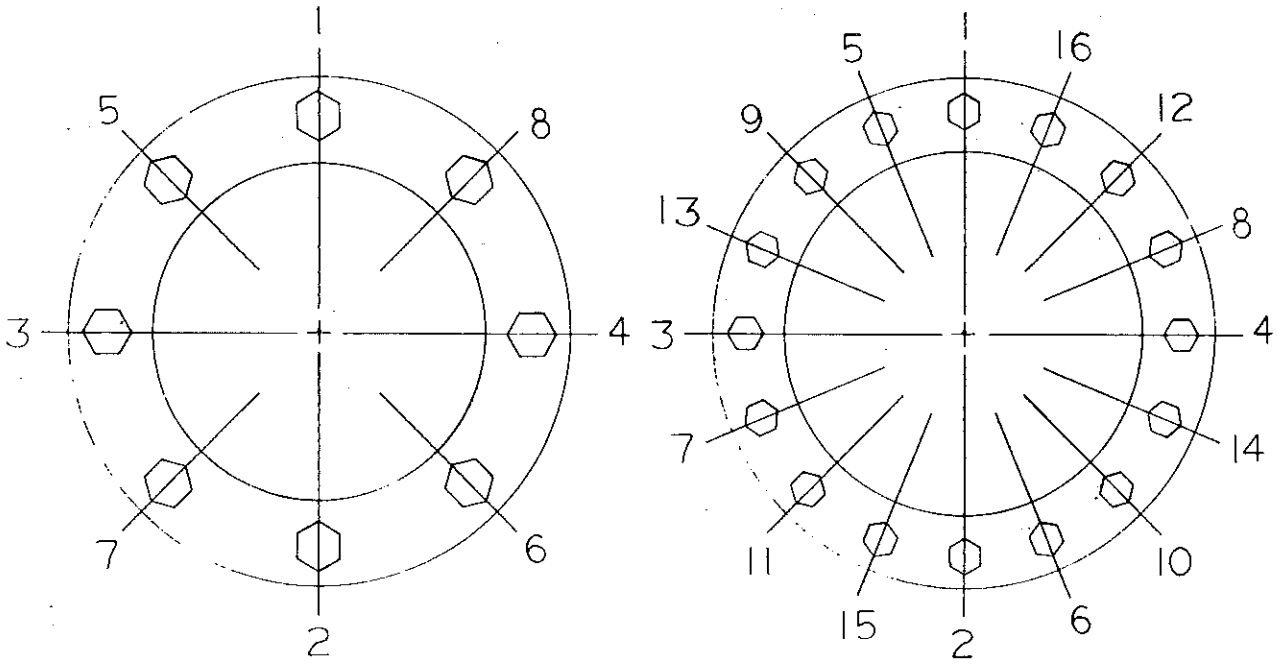
5.1 Flange mating surfaces shall be thoroughly cleaned. Assemble joint and hand tighten all fasteners to insure uniform metal to metal contact of the flange mating surfaces.

5.2 Using the proper size torque wrench (work in 1/4 to 3/4 of wrench scale), pretorque fasteners with an even steady pull to approximately 1/3 of the torque value in the sequence specified in Paragraph 5.3. Repeat sequence increasing torque to approximately 2/3 of the specified value. Finally repeat sequence for the specified torque.

NOTE: Do not use pneumatic impact wrenches.

5.3 Torquing sequence shall be as follows:

Start with any bolt and identify as (1) and location designated as 0°. Bolt (2) will be at 180°; bolt (3) at 270° and bolt (4) at 90°. Using counterclockwise rotation, tighten bolt (5), (see examples below) and continue rotation until all bolts have been tightened.



| SIZE | TORQUE (FT-LBS) CATEGORY-I (1) (3) | CATEGORY-II (2) (3) |
|---|---|---|
| 3/8-16UNC | 16 | 8 |
| 7/16-14UNC | 27 | 14 |
| 1/2-13UNC | 40 | 20 |
| 9/16-12UNC | 60 | 30 |
| 5/8-11UNC | 80 | 40 |
| 3/4-10UNC | 130 | 65 |
| 7/8-9UNC | 210 | 105 |
| 1-8UNC | 330 | 115 |
| 1-1/8-7UNC | 520 | 260 |
| 1-1/8-8UN | 470 | 240 |
| 1-1/4-7UNC | 730 | 370 |
| 1-1/4-8UN | 670 | 340 |
| 1-3/8-6UNC | 970 | 490 |
| 1-3/8-8UN | 910 | 460 |
| 1-1/2-6UNC | 1170 | 590 |
| 1-1/2-8UN | 1070 | 540 |
| 1-3/4-5UNC | 2070 | 1040 |
| 1-3/4-8UN | 2000 | 1000 |
| 2-4½ UNC | 3000 | 1500 |
| 2-8UN | 2930 | 1470 |

NOTES:

(1)Based on approximately 40,000 psi prestress.
(2)Based on approximately 20,000 psi prestress.
(3)See Page 4 for typical materials.

CATEGORY-I:

| ASTM NO. | COMMON NAME | STRENGTH (KSI) MIN. YIELD | TENSILE |
|---|---|---|---|
| A-193 GR. B7 | 4140 | 105 | 125 |
| A-193 GR. B6 | 410 | 85 | 110 |
| A-193 GR. B16 | 410 | 105 | 125 |
| A-193 GR. B5 | | 80 | 100 |
| A-325 GR. 1 | | 77 | 105 |
| A-354 GR. BB | | 78 | 100 |
| A-449 | | 92 | 120 |
| A-453 GR. 651 C1. A | | 70 | 100 |

CATEGORY-II:

| ASTM NO. | COMMON NAME | STRENGTH (KSI) MIN. YIELD | TENSILE |
|---|---|---|---|
| A-107 GR. 1018 | 1020 | 32 | 58 |
| A-193 GR. B8 C1. 1 | 18-8 | 30 | 75 |
| A-307 GR. B | | -- | 55 |
| A-320 GR. B8 | 18-8 | 30 | 75 |
| A-479 GR. 302 | 302 | 30 | 75 |
| A-479 GR. 304 | 304 | 30 | 75 |
| A-479 GR. 316 | 316 | 30 | 75 |
| A-479 GR. 410 | 410 | 40 | 65 |
| B-98 GR CDA-642 | Sil. Brz. | 35 | 72 |
| B-150 GR. CDA-642 | Al. Brz. | 35 | 72 |
| B-164 GR. 400 | Monel | 40 | 80 |

(NOTE: Strength Properties from ASME Sect. VIII and metals handbook).

**ROTATING EQUIPMENT REPAIR, Inc.**
W248 N5550 EXECUTIVE DRIVE
SUSSEX, WI 53089
Phone: (262) 820-2525
Fax: (262) 820-2233
E-mail: cpd@rerpump.com

October 10th, 2012

City of Grand Island - Platte Generating Station
1035 West Wildwood Drive
Grand Island, NE 68802
Attn: Mike Steinke

**SUBJECT: Repair to one Byron Jackson 42VX Circ. Pump "B" (RER #20120152)**

Dear Mike:

**DISASSEMBLY, BLAST CLEAN & INSPECTION:**
The pump has now been disassembled, blast cleaned and inspected. The following quote will describe in detail all "as found" conditions along with recommended repairs.

**SHAFTS:**
The pump shaft is heavily (0.006") worn at the diffuser bearing turn. The shaft has 0.008" run-out at the coupling turn, which is excessive for a shaft of this length (58"). The upper shaft is badly worn at the stuffing box. The shaft sleeve is worn.



A new shaft will be manufactured from 416 stainless steel, that has been vertically heat-treated and stress relieved. A new upper shaft will be manufactured from pump shaft quality stainless steel. A new packing sleeve will be manufactured from hardened 420 stainless steel.

**LINESHAFT COUPLINGS:**

Both lineshaft couplings and all four nuts are pitted, but should be acceptable for another run cycle.





The couplings, nuts and keepers will be re-used as-is.

**IMPELLER:**

The bronze impeller is in fair condition. The vane tips are only lightly worn. The vanes have erosion damage due to cavitation. The ring turn is worn (0.027" to 0.042" clearance to the casing ring). The bore has some old galls, but it is acceptable.






The vane cavitation damage will be excavated, weld repaired and hand dressed to contour. The vane tips will be hand dressed to remove any folded over material. A new impeller ring will be manufactured from 420 stainless steel, installed and finish machined to a standard oversized dimension. The impeller will be two plane dynamic balanced per ISO 1940 grade 2.5 specifications.

**SUCTION BELL:**

The suction bell is in fair condition. The fit from the bell to the cone is 0.007" to 0.018" loose. The suction bell bearing is worn (0.014" to 0.019" clearance to the shaft).

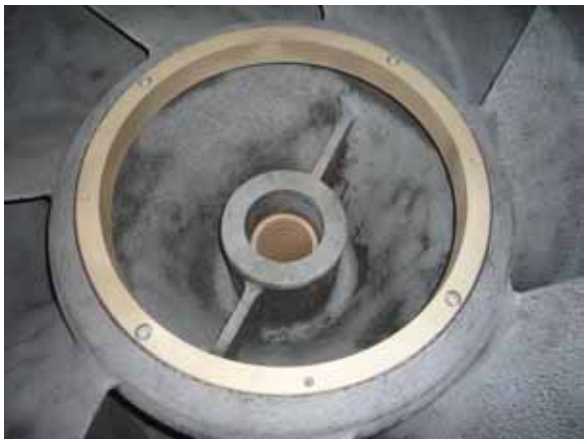
The suction bell fit turn will be pad welded and machined to a standard oversized dimension. A new bearing will be manufactured from high-lead bronze, installed and finish machined.

**CONE:**
The cone is in fair condition. The fit from the bell to the cone is loose. The fit to the diffuser is loose. The curved wear surface is only very lightly worn.


The cone wear surface will be polished minimally. The cone fit bore will be machined to a standard oversized dimension. The fit turn to the diffuser will be pad welded and machined to a standard oversized dimension.

**DIFFUSER:**
The casing ring is worn (0.027” to 0.042” clearance to the impeller ring). The bearing bore is worn (0.033” to 0.040” clearance to the shaft). The fit bore to the cone is 0.010” to 0.014” loose. The fit turn to the column is 0.030” to 0.075” loose. Some of the inlet vanes have been previously weld repaired. Two vanes have cracks that extend past the current weld repair.




The two vane cracks will be excavated, welded and hand dressed to contour. The casing ring bore will be machined to a standard oversized dimension. A new bearing will be manufactured from high-lead bronze, installed and finish machined. The fit bore to the cone will be machined to a standard oversized dimension. The fit turn to the column will be pad welded and machined to a standard oversized dimension.

**COLUMN:**

The column bearing is worn (0.022" to 0.026" clearance to the shaft). The fit bore to the diffuser is very loose. The fit turn to the discharge elbow is 0.016" to 0.025" loose.


A new bearing will be manufactured from high-lead bronze, installed and finish machined. The fit bore to the diffuser will be machined to a standard oversized dimension. The fit turn to the elbow will be pad welded and machined to a standard oversized dimension.

**ELBOW:**
The fit bores to the stuffing box and column are loose. The discharge flange is in fair condition. The piping is in poor condition. The wall thickness of the inner support area has significant material loss (up to 1/8" of the ½" sidewall is gone).






The stuffing box and column fit bores will be machined to standard oversized dimensions. The piping will be replaced. We do not feel it will be necessary to fix the thinning sidewalls at this time. The repair of the stuffing box area should drastically reduce the amount of leakage in this vicinity.

**STUFFING BOX:**

The stuffing box bearing is worn (0.028" to 0.035" clearance to the shaft). The fit turn to the discharge elbow is 0.007" to 0.015" loose. The packing bore is badly corroded. The gland stud holes are corroded as well. The packing gland is in fair condition and will be re-used.




The fit turn will be pad welded and machined to a standard oversized dimension. A new high-lead bronze bearing would be installed and finish machined. The packing bore will be machined and a liner installed. The gland stud holes will be spot welded and re-tapped.

**MOTOR COUPLING:**
The motor coupling fit bore to the shaft is oversized and tapered (0.006" taper). The coupling nut is in poor condition and the threads have begun to erode.




The coupling bore will be prepared, chrome plated and ground to design size. A concentric band will be machined in the outside diameter to aid in the alignment process. A new nut will be manufactured from 410 stainless steel.

**ASSEMBLY:**
The pump will be assembled. The pump hardware is in poor condition and will be replaced. All gaskets, o-rings, set screws and keys would be replaced as required. The pump will be prepared for shipment back to the Platte facility.

**SUMMARY OF PARTS:**

| QTY: | Description: | Material: |
|---|---|---|
| (1) | Pump Shaft | 416 S.S., P.S.Q. |
| (1) | Upper Shaft | 416 S.S., P.S.Q. |
| (1) | Shaft Sleeve | Hardened 420 S.S. |
| (1) | Suction Bell Bearing | Magnolia 120 Bronze |
| (1) | Bowl Bearing | Magnolia 120 Bronze |
| (1) | Column Bearing | Magnolia 120 Bronze |
| (1) | Stuffing Box Bearing | Magnolia 120 Bronze |
| (1) | Motor Coupling Nut | 410 S.S. |
| (Lot) | Hardware | Carbon Steel |