



City of Merced

Statement of Services Contract

Dept. Head Sig.:	_____
Due Date:	_____
Return to:	_____
_____	_____
_____	_____

Name of City Contact Johnnie Baptista Phone Ext. (209) 617-8183

Description of Services to Be Provided:

Official Use Only

Repair Well #13. Work as per Project 123064 RFP scope of work.

Provide and install all new pump, stem, column, and related components.

Re-install motor. Test and provide video proof of repair.

Check Box If Applicable to Project:

- | | | |
|--|---|--|
| <input checked="" type="checkbox"/> License (1)* Type <u>A</u> | <input checked="" type="checkbox"/> Business License (2)* | <input checked="" type="checkbox"/> Bonds (6)* |
| <input checked="" type="checkbox"/> Insurance (14)* | <input checked="" type="checkbox"/> Workers' Compensation (15)* | <input checked="" type="checkbox"/> Prevailing Wages (16)* |

**Numbers correspond to paragraph numbers on the Terms and Conditions attached hereto.*

Consultant:

Proposal/Quote

1. Per Quote #101023 from 2/01/2023
2. _____
3. _____

Total Amount \$ 258,230.60

By completing and executing this document, Consultant agrees to be bound to the Terms and Conditions attached hereto and incorporated by reference, any additional terms and conditions found on the Purchase Order, and any other terms and conditions imposed by the City and attached hereto or in the Merced Municipal Code, and makes the City an offer for the above-mentioned services at the above-mentioned price. This agreement is not binding on the City until executed by the City Manager, or his/her designee, and a Purchase Order is issued to Consultant. Any terms and conditions proposed by Consultant shall not be binding upon the City unless expressly agreed to in writing by the designated representative of the City.

The individuals executing this contract represent and warrant that they have the legal capacity and authority to do so on behalf of their respective legal entities.

Chris Shannon

Print Name

Signature

President

Position and Title

Shannon Pump Co.

275 S. State Hwy 59

Merced Ca. 95340

Name and Address of Business Entity

Date: 2/22/2023

Phone No.: 209-723-3904

License No.: 279578

DIR Registration No.: 1000011917

Accepted by City of Merced

Official Use Only

City Manager or Designee

Date

PO #

SHANNON PUMP COMPANY

275 S. Highway 59
P.O. Box 686
Merced, CA 95340
Phn: (209) 723-3904
Fax: (209) 723-5865
CONT. LIC. #279578

FFNAL

#258,630.60

Quote

Quote No.: 101023

CITY OF MERCED

678 W. 18TH ST.
MERCED, CA 95340

All Accounts are due and payable on the
10th of following month after purchase. A
FINANCE CHARGE of 1.6% based on an
ANNUAL RATE of 19.2% will be added to all
DELINQUENT ACCOUNTS. Closing date
25th of each month.

CUSTOMER	DATE	TERMS	CONTACT
CIT206	02/01/2023	NET 10th	pam 385-6833
DESCRIPTION			
CITY OF MERCED WELL SITE NO : 13 REPAIRS PER SCOPE OF WORK PROJECT NO. 123064			
AIR LIFT WELL PRESSURE WASH PERFORATIONS REAIR LIFT WELL AND FISH OUT SOUNDING CABLE			
			31000.00
REPAIR FOUR BREAKS IN WELL 18" PATCHES 1 @ 209 ft. 1@ 248.8 ft AND 2 - 6 FT FOR SOUNDER PORT			
			49000.00
PUMP REPAIR			
34		12" X 1-15/16 X10FT WATER LUBE COLUMN ASSY PER CITY SPEC	3415.38 116122.92
14" 5 STAGE BOWL ASSY 2350 GPM @ 400 TDH PER CITY SPEC			
			25153.85
HEAD SHAFT NUT & KEY REPAIR PACKING GLAND			
			1800.00
1		VIBRATION TEST	1250.00 1250.00
1		BOND	8000.00 8000.00
1.000	L22-100	SHOP LABOR READY PUMP FOR INSTALL	2500.00 2500.00

"Under the Mechanics Lien Law (California Code of Civil Procedure, Section 1181 et seq.) any contractor, subcontractor, laborer, supplier or other person who helps to improve your property but is not paid for his work or supplies, has a right to enforce a claim against your property. This means that after a court hearing, your property could be sold by a court officer and the proceeds of the sale used to satisfy the indebtedness. This can happen even if your have paid our own contractor in full, if the sub-contractor, laborer, or supplier remains unpaid."

Authorized Signature

CITY OF MERCED

Date

Thank You

SHANNON PUMP COMPANY

275 S. Highway 59

P.O. Box 686

Merced, CA 95340

Phn: (209) 723-3904

Fax: (209) 723-5865

CONT. LIC. #279578

Quote

Quote No.: 101023

CITY OF MERCED

678 W. 18TH ST.

MERCED, CA 95340

All Accounts are due and payable on the 10th of following month after purchase. A FINANCE CHARGE of 1.6% based on an ANNUAL RATE of 19.2% will be added to all DELINQUENT ACCOUNTS. Closing date 25th of each month.

CUSTOMER	DATE	TERMS	CONTACT
CIT206	02/01/2023	NET 10th	pam 385-6833
DESCRIPTION			
1	INSTALL TURBINE PUMP		12000.00 12000.00

#1) TOTAL NUMBER OF WEEKS
START TO FINISH FROM SIGNING
OF CONTRACT 4-5 WEEKS

#2) YES

3) BEST AND FINAL

Quote subtotal	246826.77
Sales tax @ 8.25000%	11803.83
Quote total	258630.60

"Under the Mechanics Lien Law (California Code of Civil Procedure, Section 1181 et seq.) any contractor, subcontractor, laborer, supplier or other person who helps to improve your property but is not paid for his work or supplies, has a right to enforce a claim against your property. This means that after a court hearing, your property could be sold by a court officer and the proceeds of the sale used to satisfy the indebtedness. This can happen even if your have paid our own contractor in full, if the sub-contractor, laborer, or supplier remains unpaid."

Authorized Signature _____

CITY OF MERCED

Date _____

Thank You

TERMS AND CONDITIONS FOR SERVICES AND PUBLIC WORKS CONTRACTS

THESE TERMS AND CONDITIONS, ("Terms and Conditions") are made and entered into on the date shown on the attached Statement of Services, by and between the City of Merced, a California Charter Municipal Corporation, ("City") and the Vendor, Consultant, or Person, ("Consultant") shown on the Statement of Services. These Terms and Conditions, Statement of Services, and Purchase Order shall herein be collectively referred to as the "Agreement." Any words that Consultant adds to the Agreement or any form that Consultant uses in the course of business will not change or supersede these Terms and Conditions. The City must agree, in writing, to any change in terms and conditions. The City's acceptance of any work or services is not an acceptance of Consultant's conflicting terms and conditions should such exist.

1. CONSULTANT QUALIFICATIONS AND STANDARD OF WORK. Consultant warrants that it is fully qualified to perform the work, and holds all applicable licenses, permits, and other necessary qualifications. Consultant shall perform and complete in a good and workmanlike manner all the work described in this Agreement to the plans and specifications provided to the Consultant by City, and shall do everything required by these Terms and Conditions and other contract documents attached hereto.

Consultant shall possess a valid Class A Special California Consultant's license at the time of bid submission for the duration of the Agreement. (Applies only if marked on the Statement of Services Form).

2. CITY BUSINESS LICENSE – (Applies only if marked on the Statement of Services Form). Consultant agrees that if its business is based within the City limits or it enters into the City to conduct business then a current City of Merced business license is required. Failure to comply with this requirement could result in criminal penalties.

3. CONSULTANT'S SERVICES. Consultant shall, at its own cost and expense and as authorized and directed by the City, provide the personnel, supervision, equipment, supplies, services, administration, transportation, and other needs to complete the work described in the Statement of Services and the City's Purchase Order, which is hereby incorporated and made a part of these Terms and Conditions, within the agreed upon time schedule and budget. The Consultant is

responsible for obtaining and administering the employment of personnel having the training, experience, licenses, and other qualifications necessary for the work assigned. All project-related costs shall be assumed and paid by the Consultant. These Terms and Conditions and Purchase Order provide the exclusive means of payment and reimbursement of costs to the Consultant by the City.

Such work shall include the following:

- a. The Consultant shall perform the services as described in the Statement of Services and Purchase Order in full compliance with these Terms and Conditions and adopted City policies and guidelines as provided to the Consultant, and in compliance with all other applicable laws and regulations.
- b. The Consultant shall perform all services and prepare all documents in professional form, exercising the special experience, skill, and education required for such service.
- c. The Consultant shall provide finished documents of presentation quality that evidence the highest standards of investigation, professional review, public participation, and presentation.

4. SCHEDULE OF PERFORMANCE AND BUDGET. The Consultant shall satisfactorily perform the services described in the Statement of Services and Purchase Order within the Time Schedule stated or agreed to between the Consultant and the City. The Consultant shall review the remaining work and remaining budget at least monthly (or at such other interval as directed by City staff) and shall confirm that completion may be expected within the budget approved or, in the alternative, give immediate notice when it shall first appear that the approved budget will not be sufficient, together with an explanation for any projected insufficiency.

The Consultant shall immediately inform the City of any problems, obstructions, or deviations of which the Consultant becomes aware affecting Consultant's ability to complete the project in a timely, efficient, and competent manner.

5. RISK OF LOSS PRIOR TO FINAL ACCEPTANCE. Risk of loss from total or partial destruction of the work, prior to final acceptance, shall be borne by Consultant regardless of the cause. Consultant shall repair or replace such damages or destroyed work to its prior undamaged condition before being

entitled to additional progress payments or final payment. Total or partial destruction or damage shall not excuse Consultant from completion of work.

6. **BONDS – (Applies only if marked on the Statement of Services Form).**

a. Consultant shall, within fifteen (15) days of contract award and before performance of the work, file a Performance Bond, with and approved by the City, in the amount of 100 percent (100%) of the contract price. The Performance Bond shall remain in effect until recordation of the Notice of Completion, or if a Notice of Completion is not recorded by the City, for sixty (60) days after completion of the work.

b. All Bonds shall be furnished by the Consultant at its own cost and expense. All bonds shall be executed by such sureties as are admitted to transact surety insurance in the State of California. Should an objection as to the sufficiency of an admitted surety on a bond be made, California Code of Civil Procedure Section 995.660 shall apply.

7. **INDEPENDENT CONSULTANT.** It is expressly understood that Consultant is an independent contractor and that its employees shall not be employees of or have any contractual relationship with the City. Consultant shall be responsible for the payment of all taxes, workers' compensation insurance and unemployment insurance. Should Consultant desire any insurance protection, the Consultant is to acquire same at its expense.

In the event Consultant or any employee, agent, or subcontractor of Consultant providing services under this Agreement is determined by a court of competent jurisdiction or the California Public Employees Retirement System (PERS) to be eligible for enrollment in PERS as an employee of the City, Consultant shall indemnify, protect, defend, and hold harmless the City for the payment of any employee and/or employer contributions for PERS benefits on behalf of Consultant or its employees, agents, or subcontractors, as well as for the payment of any penalties and interest on such contributions, which would otherwise be the responsibility of City.

8. **COMPENSATION.** Payment by the City to the Consultant for actual services rendered shall be made upon presentation of an invoice detailing services performed.

9. TERMINATION FOR CONVENIENCE OF CITY. The City may terminate the Agreement any time by mailing via certified U.S. Mail a notice in writing to Consultant that the Agreement is terminated. Alternatively, City may send said notice by facsimile with confirming notice provided via U.S. Mail. Said Agreement shall be deemed terminated as of Consultant's receipt of said notice, and no further work shall be performed by Consultant. If the Agreement is so terminated, the Consultant shall be paid for that percentage of the phase of work actually completed, based on a pro rata portion of the compensation for said phase satisfactorily completed at the time the notice of termination is received.

10. ASSIGNABILITY OF AGREEMENT. The Agreement contemplates personal performance by the Consultant and is based upon a determination of its unique personal competence and experience and upon its specialized personal knowledge. Assignments of any or all rights, duties or obligations of the Consultant under the Agreement will be permitted only with the express written consent of the City.

11. RECORDS. It is understood and agreed that all plans, studies, specifications, data magnetically or otherwise recorded on computer or computer diskettes, records, files, reports, etc., in possession of the Consultant relating to the matters covered by the Agreement shall be the property of the City, and Consultant shall deliver the same to the City upon termination of the Agreement. It is understood and agreed that the documents and other materials, including, but not limited to, those set forth hereinabove, prepared pursuant to the Agreement are prepared specifically for the City and are not necessarily suitable for any future or other use.

12. INDEMNITY. Consultant shall indemnify, protect, defend (with legal counsel selected by the City), save and hold City, its officers, employees, and agents, harmless from any and all claims or causes of action for death or injury to persons, or damage to property resulting from intentional or negligent acts, errors, or omissions of Consultant or Consultant's officers, employees, volunteers, and agents during performance of this Agreement, or from any violation of any federal, state, or municipal law or ordinance, to the extent caused, in whole or in part, by the willful misconduct, negligent acts, or omissions of Consultant or its employees, subcontractors, or agents, or by the quality or character of Consultant's work, or resulting from the negligence of the City, its officers, employees, volunteers and agents, except for loss caused by the sole negligence or willful misconduct of the City or its officers, employees, volunteers or agents. It is understood that the duty of Consultant to indemnify and hold harmless includes the duty to defend as set

forth in Section 2778 of the California Civil Code. Acceptance by City of insurance certificates and endorsements required under this Agreement does not relieve Consultant from liability under this indemnification and hold harmless clause. This indemnification and hold harmless clause shall survive the termination of this Agreement and shall apply to any damages or claims for damages whether or not such insurance policies shall have been determined to apply. By execution of this Agreement, Consultant acknowledges and agrees to the provisions of this Section and that it is a material element of consideration.

13. COMMUNICABLE DISEASE WAIVER AND RELEASE.

Consultant waives and releases the City from any and all claims, causes of action, allegations, or assertions that may arise relating to infection of any person by COVID-19 or other communicable disease that occurs, or is alleged to occur, during the course of the performance of the work covered in the agreement. Consultant also agrees to defend, indemnify, and hold City harmless from any and all claims, causes of action, allegations, or assertions made against City or City's employees arising from or relating to actual or alleged infection occurring during the performance of the work covered in the agreement, except where caused by the sole negligence or willful misconduct of the City.

14. INSURANCE – (Applies only if marked on the Statement of Services Form). During the term of the Agreement, Consultant shall maintain in full force and effect at its own cost and expense, the following insurance coverage:

a. General Liability.

- (i) Consultant shall obtain and keep in full force and effect general liability coverage at least as broad as ISO commercial general liability coverage occurrence Form CG 0001.
- (ii) Consultant shall maintain limits of no less than One Million Dollars (\$1,000,000) per occurrence for bodily injury, personal injury and property damage.
- (iii) The City, its officers, employees, volunteers and agents are to be named as additional insureds under the policy, as respects liability arising out of work or operations performed by or on behalf of the Consultant.

- (iv) The policy shall stipulate that this insurance will operate as primary insurance for work performed by Consultant and its sub-contractors, and that any other insurance or self insurance maintained by City or other named insureds shall be excess and non-contributory.
- (v) Consultant shall maintain its commercial general liability coverage for three (3) years after completion of the work and shall add an additional insured endorsement form acceptable to the City naming the City of Merced, its officers, employees, agents and volunteers for each year thereafter for at least three (3) years after completion of the work. Copies of the annual renewal and additional insured endorsement form shall be sent to the City within thirty (30) days of the annual renewal.

b. Automobile Insurance.

- (i) Consultant shall obtain and keep in full force and effect an automobile policy of at least One Million Dollars (\$1,000,000) per accident for bodily injury and property damage.
- (ii) The City, its officers, employees, volunteers and agents are to be named as additional insureds under the policy, as respects automobiles owned, leased, hired or borrowed by the Consultant.
- (iii) The policy shall stipulate that this insurance will operate as primary insurance for work performed by Consultant and its sub-contractors, and that any other insurance or self insurance maintained by City or other named insureds shall be excess and non-contributory.

c. Professional Liability Insurance. Consultant shall carry professional liability insurance appropriate to Consultant's profession in the minimum amount of One Million Dollars (\$1,000,000). Architects and engineers' coverage is to be endorsed to include contractual liability.

d. Qualifications of Insurer. The insurance shall be provided by an acceptable insurance provider, as determined by City, which satisfies all of the following minimum requirements:

- (i) An insurance carrier admitted to do business in California and maintaining an agent for service of process within this State; and,
- (ii) An insurance carrier with a current A.M. Best Rating of A:VII or better (except for workers' compensation provided through the California State Compensation Fund).

e. Certificate of Insurance. Consultant shall complete and file with the City prior to engaging in any operation or activity set forth in the Agreement, certificates of insurance evidencing coverage as set forth above and which shall provide that no cancellation or expiration by the insurance company will be made during the term of this Agreement, without thirty (30) days written notice to City prior to the effective date of such cancellation—including cancellation for nonpayment of premium. In addition to any other remedies City may have, City reserves the right to withhold payment if Consultant's insurance policies are not current.

15. WORKERS COMPENSATION INSURANCE – (Applies Only If Marked On The Statement Of Services Form). Full workers' compensation insurance shall be provided with a limit of at least One Hundred Thousand Dollars (\$100,000) for any one person and as required by law, including Employer's Liability limits of \$1,000,000.00 per accident. The policy shall be endorsed to waive the insurer's subrogation rights against the City.

16. PREVAILING WAGES – (Applies only if marked on the Statement of Services Form).

a. A determination of the general prevailing rates per diem wages and holiday and overtime work where the work is performed is available for review upon request at the City of Merced, located at 678 West 18th Street, Merced, California 95340. Consultant and subcontractors will not pay less than the prevailing rates of wages. Consultant will post one copy of the prevailing rates of wages at the job site.

b. Consultant shall forfeit as penalty to City the sum of Fifty Dollars (\$50.00) for each calendar day or portion thereof, and for each worker paid less than the prevailing rates under the Agreement.

17. TRAVEL AND SUBSISTENCE PAYMENTS – (Applies only if Prevailing Wages is marked on the Statement of Services Form). Travel and subsistence payments shall be paid to each worker as defined in the applicable collective bargaining agreements filed with the Department of Industrial Relations for the particular craft, classification or type of work.

18. HOURS OF WORK.

a. Eight (8) hours of labor constitutes a legal day's work. Workers shall be paid at a rate of one and one-half times (1 ½) the basic rate of pay for work in excess of eight (8) hours during a calendar day or forty (40) hours during a calendar week for the foregoing hours.

b. Consultant shall keep and make available an accurate record showing the name of each worker, and hours worked each day and each week by each worker.

c. As a penalty to the City, Consultant shall forfeit Twenty Five Dollars (\$25.00) for each worker, including subcontractor's workers, for each calendar day during which the worker is required or permitted to work more than eight (8) hours in one (1) calendar day and forty (40) hours in any one (1) calendar week in violation of Labor Code Sections 1810 through 1815.

19. NOTICES. Notice may be given by personal delivery or by placing the notice in a properly addressed envelope and depositing that envelope in the United States mail with first-class postage paid.

20. PROHIBITION AGAINST DISCRIMINATION. In the performance of the Agreement the Consultant will not refuse or fail to hire or employ any qualified person, or bar or discharge from employment any person, or discriminate against any person with respect to the compensation, terms, conditions or privileges of employment, because of such person's race, color, creed, national origin, ancestry, sex or age.

21. PERMITS AND LICENSES.

a. Consultant shall apply for and procure permits and licenses necessary for the work.

b. Consultant shall give notices necessary and incidental to the due and lawful prosecution of the work and shall comply duly with the terms and conditions of permits and licenses.

c. Consultant shall pay charges and fees in connection with permits and licenses.

22. VENUE. The Agreement and all matters relating to it shall be governed by the laws of the State of California and any action brought relating to the Agreement shall be held exclusively in a state court in the County of Merced.

23. WAIVER. In the event that either City or Consultant shall at any time or times waive any breach of the Agreement by the other, such waiver shall not constitute a waiver of any other or succeeding breach of the Agreement, whether of the same or any other covenant, condition or obligation. Waiver shall not be deemed effective until and unless signed by the waiving party.

24. CONFORMANCE TO APPLICABLE LAWS. Consultant shall comply with its standard of care regarding all applicable Federal, State, and municipal laws, rules and ordinances. No discrimination shall be made by Consultant in the employment of persons to work under the Agreement because of race, color, national origin, ancestry, disability, sex or religion of such person.

Consultant hereby promises and agrees to comply with all of the provisions of the Federal Immigration and Nationality Act (8 U.S.C.A. 1101 *et seq.*), as amended; and in connection therewith, shall not employ unauthorized aliens as defined therein. Should Consultant so employ such unauthorized aliens for the performance of work and/or services covered by the Agreement, and should any agency or instrumentality of the federal or state government, including the courts, impose sanctions against the City for such use of unauthorized aliens, Consultant hereby agrees to, and shall, reimburse City for the cost of all such sanctions imposed, together with any and all costs, including attorneys' fees, incurred by the City in connection therewith.

PROJECT BACKGROUND AND SCOPE OF WORK

Well No. 13 Repairs – Project No. 123064

2890 E. Gerard, Merced Ca

BACKGROUND

The Well had a significant sanding event. This was evident by the sand covering most of the pump enclosure floor. A pump company was then hired to pull and inspect the pump and casing to determine what caused the sanding event, and to then give a recommendation for repairs. The inspection included stem shaft, column, and pump disassembly, and cleaning and videotaping of the casing.

Based on the evidence from the initial video and parts inspection, the City and the pump company agree that the repairs needed include multiple swage patch repairs to the casing; plus a complete new column, shaft, couplers, spiders, and bushings; and a complete new bowl / pump assembly.

The initial inspection video (Vid No.1) is available by request via email.

baptistaj@cityofmerced.org

The discarded and worn parts will be available for inspection at the mandatory pre-bid meeting to be held on-site, 8:00am Wednesday, December 7, 2022 at 2890 E. Gerard, Merced Ca.

GENERAL SCOPE OF WORK:

Casing Repair

- Air-lift so as to return bottom of Well to original design depth of 680'. There is approximately 25' of sediment at the bottom of the casing based on initial video, covering approximately 5' of perforation.
- High Pressure Wash the perforated sections of casing. Contractor must explain the process they intend to use, including pressure, rate, and duration needed to clear the screen and rejuvenate the gravel pack as much as feasible.
- Retrieve sounding cable(s) shown in initial video.
- Video to confirm perforation conditions after pressure washing and confirm breach locations. (Vid No.2)
- Provide and place swages over breaches and sounding port.
- Video to confirm complete casing and swage placement. (Vid No.3)
- Provide City with a VOB compatible disc copy of all repair verification videos. (Vid No.2 and No.3)

Column Replacement – See details **A through E** next page

- All Equipment and Materials must meet ANSI/AWWA E103 and NSF 61 specifications.
- Provide and install 340 feet (from discharge to bowls) of all new water lube 12" column assembly as described below.
- Provide and install all new 14" – 6 Stage Bowl Assembly / 2350 GPM @400 TDH Turbine Pump. (including manufacturer's pump curve)
- Flowserve, National, Peerless, Floway, or Goulds are acceptable manufacturers.
- Provide and install new head shaft nut, key, and packing gland.

A. COLUMN PIPE (340' x 12")

1. The column pipe shall be ASTM A53 grade B steel pipe with the ends machined with 8 threads per inch. The ends of each section of column pipe shall be faced parallel, and the threads machined to sufficient length so that the column ends will butt against the spider bearing retainer shoulder to ensure proper alignment and to secure the bearing retainers when assembled. Pipe shall be connected with threaded sleeve type steel couplings. The column pipe shall be furnished in sections not over 10-feet in length.
2. The column pipe shall be lined and coated with an NSF 61 approved epoxy coating prior to delivery to the site for installation. Threaded ends shall be left uncoated.
3. Minimum column pipe wall thickness for each nominal pipe diameter shall be Standard (P.E.) as follows:

<u>Nominal Size</u>	<u>Outside Diameter</u>	<u>Minimum Wall Thickness</u>	<u>Weight per Length</u>
4"	4.500"	0.237"	10.79 lb/ft
5"	5.563"	0.258"	14.62 lb/ft
6"	6.625"	0.280"	18.97 lb/ft
8"	8.625"	0.322"	24.70 lb/ft
10"	10.750"	0.365"	34.24 lb/ft
12"	12.750"	0.375"	43.77 lb/ft
14"	14.000"	0.375"	54.57 lb/ft
16"	16.000"	0.375"	62.58 lb/ft

4. Column size shall conform to the standard bowl discharge size and to the permissible column sizes for the selected discharge head. Column pipe wall thickness shall be designed to bear the entire load of the column pipe and bowl assembly.

B. LINESHAFT (1-15/16")

1. Lineshaft shall conform to the requirements of AWWA E103-07. The maximum combined shear stress shall not exceed 30% of the elastic limit in tension or be more than 18% of the ultimate tensile strength of the shafting steel used. The lineshaft shall be of ample size to operate the pump without distortion or vibration while transmitting the maximum horsepower imposed by the bowl assembly.
2. The maximum combined shear stress for the lineshaft couplings shall not exceed 20% of the elastic limit in tension, nor be more than 12% of the ultimate tensile strength of the shafting steel used.
3. The lineshaft (including headshaft) shall be ASTM A582, type 416 stainless steel connected to type 316 stainless steel lineshaft couplings and shall have a surface finish at bearing locations not to exceed 40 Ra per ANSI B46.1. The lineshaft shall be furnished in interchangeable sections not over 10 feet in length. The butting faces shall be machined, faced, and recessed square to the axis of the shaft. To insure accurate alignment, the shaft shall be straightened to within 0.005 inches total indicator reading per 10 feet in length. The maximum permissible error in the axial alignment of the thread axis with the axis of the shaft shall be 0.002 inches per 6 inches in length. The sections shall be turned, ground, and polished. Lineshaft couplings shall have left handed thread to tighten during pump operation. The lineshaft shall be of ample size to operate the pump without distortion or vibration while transmitting the maximum horsepower imposed by the bowl assembly. Lineshaft shall be sized such that elongation due to hydraulic thrust will not exceed the clearance available of the impellers in the pump bowls.
4. The pump manufacturer shall include a method of adjusting the pump impellers at the top of the headshaft. The adjustment method shall provide a positive locking device.

C. BRONZE CENTERING SPIDERS (Bearing Retainers)

1. The shaft bearings shall be designed to be lubricated by the water pumped. Shaft bearings shall be mounted in bronze centering spiders (bearing retainers) that shall be held in position in the column couplings by means of the butted ends of the column pipes. Bearings shall be new fluted neoprene rubber retained in the spider by a shoulder on each end of the bearing.
2. The bearings shall be spaced at intervals of not more than 10 feet. A spider bearing shall be installed no lower than five feet below the discharge head to ensure adequate support of the lineshaft through the head for alignment purposes.

D. PUMP BOWL ASSEMBLY (14" – 6 stage / 2350 GPM @400' TDH)

1. Internal and external ferrous surfaces in contact with water shall be coated with an

NSF/ANSI 61 certified vitreous glass enamel or fusion bonded epoxy.

2. The pump bowl assembly shall include bowls made of close-grained cast iron, free from blow holes, sand holes or other detrimental defects, ASTM A48 Class 30. The bowl design shall be heavy walled to withstand the pressure developed by the pump. The intermediate bowls shall be constructed with bronze-backed marine bearings to support the impeller shaft. The bowl unit shall be capable of withstanding a hydrostatic pressure equal to twice the pressure at the rated capacity or 1.5 times the shutoff head, whichever is greater.
3. The impeller shaft shall be made of 416 stainless steel, turned, grained and polished. It shall be supported by bronze bearings above and below each impeller. Each impeller shall be made of bronze, cast in one piece, enclosed, accurately machined, underfiled, slurry polished to 60 microns RMS (ISO 19-40 Grade 6.3) and be statically and dynamically balanced (ISO G 6.3). Each impeller shall be securely fastened to the shaft with a tapered lock collet/bushing of the same material as the bowl shaft. The bowl shall include an inserted side seal at the impeller skirt. The top discharge case shall be fitted for water lubricated duty. All bolting shall be 316 stainless steel.

E. SUCTION ASSEMBLY

1. A suction pipe 10 feet in length, of the same standard diameter, material, and thickness as the pump column pipe, shall be provided. The suction pipe shall have one plain end and one threaded end.

2.01 NAMEPLATES

- A. Each major item of equipment shall have the manufacturer's name, address, type or style, model, serial number, and catalog number on a stainless-steel plate secured to the item of equipment. In the case of the submerged pump assembly, a pump/bowl nameplate shall be placed in a visible location on the pump discharge head.
- B. The nameplate for the pump located on the discharge head shall show the manufacturer, size, capacity in gallons per minute, rated total dynamic head in feet, speed in revolutions per minute, model type, No. of stages, impeller diameter, year, serial number, and other pertinent data, such as bury depth.

Testing and Run to Waste

- When it is time, City Water will confirm rotation and run a short test to confirm if repairs were a success. The expectation is a smooth operating pump without vibration, chattering or binding.
- Contractor will conduct a vibration test confirming compliance with the requirements set forth in Code M121 (ANSI.HI 9.6.4) "Vibration Testing for Centrifugal and Vertical Pumps".
- City Water will run the Well to waste at 80% for 60 minutes or until water is clear.

- City Water will then turn the motor off long enough for the pump to stop spinning.
- City Water will then run the Well to waste again at 80% for 60 minutes or until water is clear.
- City Water will perform several jar tests to check for sand and debris. The expectation, based on performance prior to this issue, is minimal sand at start-up and nearly zero sand after 5 minutes run time. A simple jar test grab sample will be used by City Water.
- The Contractor has no BacT sampling or testing responsibilities.