

**Furnish of all labor, tools, materials, equipment necessary to**

**remove and replace one deep set submersible pumping unit and associated components for the North Waihee Well #1 (State Well ID# 6-5631-002)**

**For the Department of Water Supply**

**County of Maui**

**Formal Bid**

**Job No. IFB# DWSP 2020-21**

**Invitation to Bidders**  
**Job No. IFB# DWSP 2020-21**

Sealed Bids to furnish all labor, tools, materials and equipment necessary to remove and replace one deep set submersible pumping unit and associated components, for the **North Waihee Well #1, Maui, (State Well ID# 6-5631-002), for the Department of Water Supply, County of Maui, will be received up to 10:00 o'clock a.m. on**

JANUARY 30, 2020

and publicly opened thereafter in the Fiscal Officer's Office of the Department of Water Supply located on the fifth (5th) floor of the County Building at 200 South High Street in Wailuku, Maui, Hawaii.

Specifications and Proposal Forms may be obtained at the Office of the Purchasing Agent, Fiscal Division, located on the fifth floor of the County Building. Office hours are 7:45 a.m. - 4:30 p.m., Monday thru Friday, or visit State Procurement Website or the Maui County website: [www.mauicounty.gov](http://www.mauicounty.gov), under Bids & Proposal/Good – All non vehicle goods.

Bidders must have current C-57 Pump Specialty contractor's license and be in compliant with Section 103D of the Hawaii Revised Statutes.

  
\_\_\_\_\_  
SCOTT K. TERUYA  
Director of Finance  
County of Maui

**Furnish of labor, tools, materials and equipment to remove and replace one deep set submersible pumping unit for the North Waihee Well #1 (State Well ID# 6-5631-002)**

**Special Provisions  
Job No. IFB# DWSP 2020-21**

1. To furnish all labor, tools, materials and equipment necessary to remove and replace one deep set submersible pumping unit and associated components for the North Waihee Well #1, (State Well ID# 6-5631-002) for the Department of Water Supply, County of Maui, shall be subject to the Specifications, Special Provisions, Proposals, and General Conditions (bid documents) in this order of priority.
2. Prices bid shall include all material costs, labor costs, freight, insurance, taxes (except Federal Excise Tax from which the County is exempt), to Maui County Department of Water Supply, to job site where the items are delivered.
3. It is understood that a bidder who does not indicate a State of Hawaii General Excise Tax License Number in the appropriate space provided (on the last page of this proposal) has not obtained said license from the Hawaii State Department of Taxation and shall be considered an out-of-state bidder. In accordance with Section 17 of the General Conditions, the applicable retail rate of General Excise Tax is 4% and applicable use tax is 1/2% shall be added to his bid in determining the low bidder.
4. The Director of the Department of Water Supply reserves the right to withhold award of contract for a period of thirty (30) calendar days from the date of bid opening.
5. The Director reserves the right to accept or reject any or all bids and to waive any minor or inadvertent discrepancy in the bid documents.
6. No withdrawal of bid will be allowed after the bids are opened.
7. As a prerequisite for entering into a contract Bidders shall submit a current Tax Clearance, Certificate, Certificate of Good Standing, and Certificate of Compliance by using the Hawaii Compliance Express, which allows businesses to register online through a simple wizard interface at:

<http://vendors.ehawaii.gov/hce/splash/welcome.html>

Bidders registered with Hawaii Compliance Express may submit a one-page printout from the Hawaii Compliance Express website.

**Furnish of labor, tools, materials and equipment to remove and replace one deep set submersible pumping unit for the North Waihee Well #1 (State Well ID# 6-5631-002)**

**Special Provisions  
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8. **SUBMISSION OF PROPOSAL**

Each bid, intact and bound with the Bid Documents shall be enclosed in a sealed envelope and delivered to the Department of Water Supply, County of Maui, as indicated in the official advertisement at the address name in the advertisement. The outside of the envelope shall be plainly marked as follow:

YOUR COMPANY NAME AND ADDRESS

IFB# 2020-21

FURNISH OF LABOR, TOOLS, MATERIALS AND EQUIPMENT TO REMOVE AND REPLACE ONE DEEP SET SUBMERSIBLE PUMPING UNIT FOR THE NORTH WAIHEE WELL #1 (STAE WELL ID# 6-5631-002)FOR THE DEPARTMENT OF WATER SUPPLY, COUNTY OF MAUI.

All bids must be identified with the bidder's name, address, and appropriate licenses. Faxed offers shall be rejected.

9. Bid must be in our hands by 10:00 o'clock a.m. on the date scheduled for bid opening. Bids mailed and postmarked earlier than the date and time specified for bid opening but received later will be rejected.
10. One contract shall be awarded to the lowest evaluated bidder.
11. Bidders should make a site inspection before submitting bid documents.
12. Any questions or request for site inspections, and specification questions should contact Dean Tanimoto at 270-7551. All other questions should be addressed to Ken Bissen, Jr. at 270-7684.
13. For Terms and Conditions for Goods and Service go to:  
[www.mauicounty.gov/department/Finance/purchasing](http://www.mauicounty.gov/department/Finance/purchasing). Look for Purchasing Terms and Conditions, Goods and Services.

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14. Liquidated Damages. The seller recognizes and agrees that time is of the essence under this agreement and, due to the speculative character and difficulty of ascertaining damages to the Department of Water resulting from any delay beyond controversy and dispute, will agree that the seller shall pay to the Department of Water the sum of ONE THOUSAND AND NO/100 DOLLARS (\$1,000.00) as liquidated damages and not as a penalty for each day that furnishing and delivery of the material contemplated in this agreement remains uncompleted beyond the time set herein for completion; provided, however, that the remedy of liquidated damages shall be in addition to any other rights and remedies otherwise available to the Department of Water and not expressly waived herein.
15. Contract Performance and Payment Bonds are needed for this project. Bid Bond is not needed.
16. Time of Performance which is stated in the scope of work on item 14 will be within 120 calendar days.
17. Due to the criticalness of the pumping unit, instead of the usual 30 days of advertisement, the opening date will be less than 30 days.
18. No addendum will be issued 5 business days before bid opening.

**Furnish of labor, tools, materials and equipment to remove and replace one deep set submersible pumping unit for the North Waihee Well #1 (State Well ID# 6-5631-002)**

**PROPOSAL  
Job No. IFB# DWSP 2020-21**

**Company Name:** \_\_\_\_\_

**Date:** \_\_\_\_\_

Director of Water Supply  
County of Maui  
Wailuku, Maui, Hawaii

Dear Sir:

The undersigned hereby proposes to furnish all labor, tools, materials and equipment necessary to remove and replace one deep set submersible pumping unit, and associated components, for the North Waihee Well #1, Maui (State Well ID# 6-5631-002) for the Department of Water Supply, of the County of Maui, for all in strict compliance with the attached Special Provisions, Specifications, General Conditions, and this proposal, the following:

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FIRM LUMP SUM PRICE. . . . . . \$ \_\_\_\_\_

\*\*\*\*\*

DELIVERY WILL BE MADE IN 120 CALENDAR DAYS OR LESS FROM THE "NOTICE TO PROCEED" ISSUED BY THE DIRECTOR OF WATER SUPPLY.

C-57 Pump Specialty License number \_\_\_\_\_

# **North Waihee Well #1**

**(State Well ID #6-5631-002)**

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# **North Waihee Well #1**

**(State Well ID #6-5631-002)**

## **1. GENERAL REQUIREMENTS**

### **1.1. PROJECT DESCRIPTION**

The project consists of the furnishing of all labor, tools, materials and equipment necessary to remove and replace one deep set submersible pumping unit and associated components as specified in Section "SCOPE AND WORK TO BE DONE BY CONTRACTOR". The existing pump and motor shall be analyzed to determine cause of failure. The North Waihee Well #1 is located in Waihee, Hawaii. (top of River Rd)

Information derived from the plans showing location of utilities and structures will not in any way relieve the Contractor from any risk or from properly examining the site and making such additional investigations as he may elect, or from properly fulfilling all the terms of the Contract Documents.

The Contractor acknowledges that he has satisfied himself as to the nature and location of the work, the general and local conditions, particularly those bearing upon availability of labor, water, electric power, roads, and uncertainties of weather, the conformation and conditions of the ground, the character of equipment and facilities needed preliminary to and during the prosecution of the work and all other matters which can in any way affect the work or the cost thereof under this contract.

### **1.2. APPLICABLE REGULATIONS**

The Contractor shall comply with all applicable current local, State, and Federal laws, ordinance, rules and regulations pertaining to such work and must obtain and pay for required permits, license and certificates and publish or post all notices required thereby.

### **1.3. TRADE NAMES**

Trade names or specific manufacturers are used in describing materials for purposes of establishing minimum quality. Bidder must submit data as necessary to demonstrate equivalency of substitution. The decision of the Director shall be final as the adequacy of any requested substitutions.



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## **1.4. FIRE PREVENTION AND PROTECTION**

The Contractor shall perform all work in a fire-safe manner. The Contractor shall supply and maintain on the site adequate fire-fighting equipment capable of extinguishing incipient fires. The Contractor shall comply with applicable local and State fire prevention regulations and where the regulations do not cover, with applicable parts of the National Fire Prevention Standard for "Safeguarding Building Construction Operations" (NFPA No. 241).

## **1.5. ELECTRIC POWER AND WATER**

Unless otherwise specified, the Contractor shall furnish all materials, labor and equipment to disconnect and re-connect electrical conductors to the terminal box on the surface plate. No water is available at site.

## **1.6. SANITARY FACILITIES**

The Contractor shall provide and maintain sanitary facilities that comply with the regulations of the local and State Department of Health for their employees and subcontractors' employees.

## **1.7. PUBLIC SAFETY AND CONVENIENCE**

During the period of construction, the Contractor shall protect the public against mud, dust, and other nuisances along the project and shall take special means to abate the causes of such nuisances. Comply with the provisions of Chapter 342. HRS. Environmental Quality, and Chapter 37-A, Water Quality standards.

## **1.8. RESPONSIBILITY FOR DAMAGE TO EXISTING IMPROVEMENTS**

Where any existing improvements, which are intended to remain, are damaged by the Contractor, the Contractor shall promptly repair or replace the damaged portion at the Contractor's expense, to the Department of Water Supply's satisfaction.

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Take necessary precautions to prevent damage to existing utilities, structures, fencing, and improvements, whether above ground or underground. While the information on the plans have been compiled from the best available sources, its completeness and accuracy cannot be guaranteed.

## **1.9. SITE RESTORATION AND CLEAN UP**

At all times during the work, keep the premises clean and orderly, and upon completion of work, leave the project free of rubbish and excess materials of any kind.

During the project, store materials and equipment and conduct operations so as to do the least damage and inconvenience, regardless of whether on private property, State or County right-of-ways. Unless otherwise shown, restore area to original or better condition, provide proper grading, free draining, free from holes, rough spots, or detrimental surface features. Damaged paving, fences, and planted areas shall be properly restored.

## **1.10. LANDMARKS DAMAGES**

All landmarks removed shall be replaced as originally found at the Contractor's expense. If any previously unidentified historical, cultural or architectural and/or archeological sites or remains are uncovered, work shall be stopped to permit the Department of Water Supply's representative to perform site examinations. Do not restart work until examinations by all agencies affected, including the State Historic Presentation Office, are completed. No additional payment will be made for this item.

## **1.11. FIRST AID KITS AND ACCIDENTS**

The Contractor shall provide at the site such equipment and medical facilities as are necessary to supply first aid service to anyone who may be injured in connection with the work.

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The Contractor must promptly report in writing to the Department of Water Supply's representative all accidents whatsoever arising out of or in connection with the performance of the work whether on or adjacent to the site which caused death, personal injury or property damages, giving full details and statement of witnesses. In addition, the accident shall be reported immediately by telephone or messenger to the Department of Water and the Police Department.

If any claim is made by anyone against the Contractor and or subcontractor on account of any accident, the Contractor shall promptly report the facts in writing to the Department of Water Supply, County of Maui and the insurance company giving full details of the claim.

## **1.12. MEASUREMENTS**

Computed dimensions and drawings take precedence over measurements by scale, and detail drawings over general drawings. The Contractor must verify all measurements at the site and be responsible for the accuracy of the same.

## **1.13. INCIDENTAL COSTS**

In describing work to be performed by the Contractor, certain small parts of various items are omitted and classified as incidental to the rest of the work. All such minor parts not listed, classified or itemized in the proposal shall be considered to be incidental to the work to be performed, and such minor parts may be included in the Contractor's bid on items in the proposal.

## **1.14. PAYMENT**

The work specified in this section shall be considered incidental to the cost and the expense of the project shall be included in the lump sums or unit prices of various proposal bid items as applicable.

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## 2. GENERAL REQUIREMENTS OF THE CONTRACTOR

- 2.1. The Contractor shall hold a current C-57 Pump Specialty contractor's license and hold third party liability and property damage insurance in the amount of one million dollars. A copy of the certificate of issuance shall be submitted to the Department of Water.
- 2.2. The Contractor shall have a minimum of ten (10) years experience.
- 2.3. The Contractor shall be responsible for maintaining the integrity of the well throughout the contract period.
- 2.4. The Contractor shall provide Well Completion Report Part II (Pump Installation), as-built and installation plans to the Department of Water upon completion of the project.
- 2.5. The Department of Water reserves the right to terminate all operations at any time.
- 2.6. **Pump and Motor specs, performance curve shall be submitted with bid submittal.**

## 3. SCOPE OF WORK TO BE DONE BY CONTRACTOR

Unless otherwise specified, the Contractor shall furnish all materials as specified below, labor, and equipment as necessary to accomplish the following work:

- 3.1. Purchase and deliver one (1) new factory tested motor, pump, column assembly and submersible power cables for motor drive complete, new continuous Stainless Steel (SS) air line of for well level "bubbler" system. (Refer to Section ORDERING OF PUMPING UNITS, DRAWINGS AND DATA SHEETS" and "PUMP ASSEMBLY")
- 3.2. Remove the existing motor, pumping unit, and appurtenances from well. Determine the root cause of failure and submit a written report with photos and findings to the Department of Water.

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- 3.3. Bail well to insure that it is free of silt, foreign objects, and rubbish. Inspect to determine the condition of the well casing, including perforations, by using a down-hole camera. Remove any accumulated loose rock, sand, and silt from well. Clean perforations and entire column by using Heavy-Duty brush with bristles made from steel cable or similar. The brush shall be large enough and long enough to agitate and scrub the inner walls of the well casing simultaneously. After cleaning, repeat inspection by using a down-hole camera. Make recording of video inspection in DVD format and submit to Engineer or Project Manager for approval. Refer to Section "CONTRACTORS RESPONSIBILITY FOR CHECKING WELL". The Contractor shall conform to Environmental Laws regarding disposal of bailed oil, silt, and rubbish.
- 3.4. Measure and record the static well level. Determine the approximate bottom elevation of the solid and perforated casing. Log and report measurements to Department of Water.
- 3.5. Install new submersible pumping unit / cable complete including the continuous SS air line/bubbler tube. Disinfect pump, including columns, each section at a time before installation. Airline shall be set to the minimum submergence level as specified by the pump manufacturer.
- 3.6. Disinfect well after startup testing. (Refer. ANSI/AWWA C654-87). The Contractor is responsible for disinfection and proper disposal of all flushed water, erosion control, Contractor shall be responsible for any damages during flushing operations, testing and all other test runs until well is cleared by State of Hawaii, Department of Health, SDWB to go back online.  
Any disposal of water shall be neutralized, free of chlorine, before disposal. If required, prepare and submit NPDES permit application and conform to all NPDES requirements for disposal of pump discharge water and disinfection water. NPDES permits and requirements are all the responsibility of the Contractor.
- 3.7. Measure and record static and running pumping levels.

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- 3.8. Start-up and ascertain that the pump is functioning properly free of abnormal vibration and running at the normal horsepower at the specified TDH (Total Dynamic Head). Perform field operational and efficiency testing of the pumping unit. Refer to Section "TESTING OF PUMPING UNIT". The efficiency test shall be made in accordance with ANSI B58.1 (AWWA E101 Appendix A "Field Testing of Vertical Turbine Pumps"). No less than 7 points test points, including shut-off head, shall be recorded in order to verify the pump and motor performance.
- 3.9. The Discharge Column Assembly: The column pipe shall be Schedule 40 steel pipe with minimum column thickness of .365 inches conforming to ASTM Designation A53, Grade B, size, coated with zinc inside and outside by the hot-dipped process with no less than 1.8 ounces per square foot. The pipe shall be minimum 10 inch diameter. The pipe ends shall be provided in ANSI standard tapered pipe threads or API 8 round as required for this setting. Column sections shall not exceed 20' in length. Discharge Column Couplings shall be sleeve type galvanized steel couplings conforming to ASTM A53. The maximum allowable friction loss shall not exceed 5 feet per 100 feet of column, based on the rated capacity of the pump.
- 3.10. Testing for coliform bacteria will be performed by the Department's Water Quality Laboratory. If the results show a presence of coliform bacteria, the contractor shall repeat disinfection and flushing until repeat tests indicate that coliform bacteria is not present.
- 3.11. Contractor will be responsible for removing, disposing and related cost for all unused parts and materials from the project site. ( Refer to "PROJECT DESCRIPTION")
- 3.12. Salvageable Items: All salvageable items, as determined by the Department of Water Supply, shall be delivered to a site designated by the Department of Water Supply or its representative. All other items shall be the property of the Contractor and shall be disposed of at his expense.

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## **4. CONTRACTOR'S RESPONSIBILITY FOR CHECKING WELL**

Checking of the existing well shall be done by a well driller holding a current C-57 Well Drilling Specialty License from the State of Hawaii. The well driller shall check the well for silting, caving-in, and foreign materials before installing the pumping unit. The testing procedure must be approved by the Department of Water Supply prior to starting. Any condition thus found to be unsatisfactory shall be immediately reported to the Department, and any unforeseen additional scope of work shall not be performed without the approval of the Department. A written report stating the results of the test shall be submitted to the Department upon completion of testing.

## **5. WORKMANSHIP**

The Contractor shall be responsible for all work pertaining to the pumping assembly including motor, discharge pipe, and setting of the pump.

## **6. SERVICES OF MANUFACTURER**

### **6.1. MANUFACTURER'S REPRESENTATIVE**

The Contractor shall furnish the services of a factory-trained representative for the installation, inspection, testing, and start-up of the pumping units. The representative shall be familiar with the installation of deep-well pumping units as well as recommendations and instructions of the pump manufacturer.

### **6.2. LOCAL SERVICE OUTLET**

The supplier of the pumping units shall maintain a service and maintenance department staffed with full-time, trained service personnel in the State of Hawaii.

### **6.3. PLUMBNESS AND ALIGNMENT TESTING**

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## 6.3.1 DESCRIPTION:

This section of the specifications describes in detail the specifications of new material and work required to conduct Plumbness and Alignment Testing as required by MDWS. Prior to new pump installation the Contractor shall have both a plumbness and alignment test performed on the existing well as outlined below to ensure that the specified pump can be freely installed.

## 6.3.2 PLUMBNESS TEST:

Testing for plumbness of the well shall be made with a plummet, rigged so that the plumb line is centered in the well casing when the top of the plumb is level with the top of the casing. A plumb ring or plunger  $\frac{1}{4}$  inch smaller than the inside diameter of the casing shall be furnished by the Contractor for the purpose of performing the plumbness test. The plumbness for the well shall be determined in ten-foot intervals from the ground surface to the total depth. Perform, record, and report plumbness test per ANSI/AWWA A100 – 06, Standard 4.7.9 and Appendix D, except as noted below. The well shall not vary from the vertical plumb line in excess of 6 inches per 100 feet of depth.

## 6.3.3 ALIGNMENT TEST:

Test the alignment of the casing/well screen by lowering into the well a pipe or dummy that is 40 feet long. A pipe or dummy with an outer diameter  $\frac{1}{2}$  inch less than the inside diameter of the casing shall be furnished by the Contractor for the purpose of performing the alignment test. If a dummy is used, the dummy shall consist of a rigid spindle of extra-heavy pipe with a minimum of three 12-inch wide rings rigidly fixed to the pipe at the top, bottom, and center. These rings should be affixed so that they cannot move longitudinally along the pipe spindle. The rings shall consist of material which will not harm the interior of the casing while being lowered. Lower the dummy through the casing to the well's total depth. The dummy should move freely throughout this entire length of the well. Perform the alignment test in the presence of the Department of Water Supply Personnel. Perform, record, and report alignment test per ANSI/AWWA A100 - 06, Standard 4.7.9 and Appendix D.



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## 7. ORDERING OF PUMPING UNITS, DRAWINGS AND DATA SHEETS

The pumping unit shall be ordered after notice to proceed has been issued and as soon as calculations, shop drawings and pump data have been approved by the Department of Water Supply, County of Maui.

7.1. An electronic PDF file of drawings showing the dimensions of the pumping units, pump performance curves and pump and motor data sheets shall be submitted by the Contractor and approved by Department of Water Supply, County of Maui Staff before ordering any materials.

7.2. Well Completion Reports Part II (Pump Installation), As-built and installation plans shall be submitted by the Contractor to the Commission on Water Resource management upon completion of the project and final payment.

## 8. PUMPING UNIT AND APPURTENANCES

### 8.1. GENERAL

This section covers the requirements for furnishing delivering, installing and testing one pump unit complete.

### 8.2. OPERATING CONDITIONS

The pumping unit shall be furnished on the basis of the following performance characteristics.

8.2.0	Submersible Motor / 480 volt 3 phase	150 HP
8.2.A	Pump rated capacity	1050 GPM
8.2.1.	Minimum pump bowl efficiency at design point	84%
8.2.2.	Wire to Water Efficiency	73% min.
8.2.3.	TDH	420 ft.
8.2.4.	RPM	1770
8.2.5.	Discharge column size	8 in
8.2.6.	Casing diameter (I.D.)	16 in.
8.2.7.	Total Well Depth (from top)	387 ft.
8.2.8.	Water Level Top Elevation	10.35 ft. msl
8.2.9.	Ground Elevation:	281' msl

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## 9. PUMP ASSEMBLY

The pumping unit shall be designed for pumping potable drinking water. The pumping unit shall be manufactured by Flowserve, Floway, Byron Jackson or Xylem Goulds. The pump shall be engineered and manufactured in its entirety under the certification of ISO-9001. All components of the pump assembly must be NSF 61 certified. The pump and motor shall be furnished by one manufacturer and carry unit responsibility.

9.1. Bowl Assembly: The bowls shall be flanged type constructed of close grained cast iron conform to ASTM A48 Class 30 or ASTM A536 ductile iron where required. The bowls shall be capable of withstanding a hydrostatic pressure equal to twice the pressure at rated flow or 1.5 times shut-off head, which ever is greater. The bowls shall be without imperfections free from sand holes, blowholes, or other faults and must be accurately machined and fitted to close tolerances. The bowls shall have porcelain epoxy lined waterways for maximum efficiency and wear protection. All intermediate bowls shall be of identical design for interchangeability. Bowls and cases shall be accurately machined and fitted to close dimensions with sleeve type bearings made of bronze alloy C89835. The discharge bowl shall be used to connect the bowl assembly to the discharge pipe.

9.2. Impellers: The impellers shall be constructed from ASTM B584 C87610 Silicon Bronze or 316SS Impellers and shall be the enclosed type. They shall be free from defects and must be accurately cast, machined, balanced, and filed for optimum performance and minimum vibration. Impellers shall be dynamically balanced grade G6.3 of ISO 1940 as minimum. Passages shall be smooth to assure efficient operation and to prevent air or sand locking. The impeller shall be locked securely to the shaft with ASTM 582 type 316 stainless steel taper locks.

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9.3. Pump Shaft: The pump shaft shall be made of ASTM 582 416 stainless steel. It shall be precision ground and polished with surface finish better than 40 RMS. The shaft shall be supported by suitable bronze sleeve type bearings on both sides of each impeller with positive means for water lubricating each bearing. Sand deflectors, locked securely to the shaft, shall be provided to prevent dirt, sand or other foreign particles from entering the shaft bearings. The shaft coupling shall be of 416 stainless steel and be capable of transmitting the total torque and total thrust of the bowl assembly in either direction of rotation.

9.4 Suction Interconnector and Strainer: The suction interconnector and strainer shall join the pump bowls to the motor housing and shall act as a suction bowl and shall support the strainer. The interconnector shall contain suitable B584 C89835 Bismuth Bronze bearings or approved equal to guide the lower end of the pump shaft. The interconnector shall be of cast iron, ASTM A 48, Class 30 or better.

The suction strainer, mounted on the interconnector housing, shall be of zinc-less bronze or stainless steel, fabricated from a perforated plate or expanded metal screen, with a net inlet area equal to at least three (3) times the impeller inlet area. The maximum unit opening shall not be more than 75 percent of the minimum opening of the water passage through the bowl or impeller.

9.4. DISCHARGE COLUMN ASSEMBLY: The discharge column assembly shall consist of the discharge column pipes and couplings. After assembly of each section, the joints shall be locked in place with steel strips welded to the pipe and coupling, or by other approved method, to prevent loosening of the joints. The joints shall be locked in such a way that no damage to the components or threads result during assembly and disassembly. The method of locking the joints shall be approved by the Department of Water Supply.

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**Discharge Column Pipe:** The discharge column pipe shall be replaced unless otherwise directed by the Department of Water Supply. New replacement column pipe shall be Schedule 40 steel pipe conforming to ASTM Designation A 53, Grade B, size and thickness as specified, coated with zinc inside and outside by the hot-dip process. The pipe shall be minimum 10 inch diameter. The pipe ends shall be provided in ANSI standard tapered pipe threads or API 8 round as required for this setting. The maximum allowable friction loss shall not exceed 5 feet per 100 feet of column, based on the rated capacity of the pump. Column sections shall not exceed 20' in length.

Discharge Column Couplings shall be sleeve type galvanized steel couplings conforming to ASTM A53, Sched 40 provided in ANSI standard tapered pipe threads or API 8 round as required for this setting.

- 9.7 **Discharge Column Check Valve:** Two galvanized discharge column check valves as manufactured by Lakewood Coupling Company, or approved equal, shall be provided and installed in the discharge column as shown. The check valve shall be located 10-20 feet above the top of the pump bowls and shall be completely submerged under the static water level. The second check valve shall be located 3/5 of the distance to the top of the discharge column piping. The check valve shall be of galvanized steel construction with ends provided with ANSI standard female tapered pipe threads or API 8 Round as required. A neoprene tube shall cover the upper cross bar to absorb the opening shock of the double flapper during start up.
- 9.8 **Surface Plate Assembly:** The surface plate assembly shall include discharge flange, surface plate, sole plate, electrical junction box assembly, and appurtenant pump control piping. The junction box shall be new, sized per NEC standard and made of 316 stainless steel. The surface plate and discharge flange shall be of 416 Stainless Steel or galvanized steel or fabricated steel. The assembly shall be rigid enough to support the entire weight of the suspended parts and all thrust loads. The surface plate, to which the pump and column assemblies are attached, shall be provided with at least three openings for the power cable, well vent, and water level indicator. The plate shall also support the discharge flange of the size and rating specified. Suitable lifting lugs or pad eyes shall be provided to support the suspended components safely during installation and servicing.

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The sole plate shall be accurately machined, drilled, and tapped to fit the discharge head and shall be properly fitted in as a permanent part of the concrete pump foundation to prevent the entrance of water into the well. The opening of the sole plate shall be of sufficient size to allow the installation of the pump bowl assembly, and related appurtenances.

Sole Plate: The existing pump sole plate shall be replaced with a new sole plate. The discharge head shall sit on top and be secured through the new sole plate, which itself shall sit on top the existing concrete pump base. The new sole plate shall be tapped to receive the stud bolts used to secure the discharge head. Existing fasteners shall be discarded and replaced with new. The new sole plate shall be manufactured from steel and sized as specified.

9.9 SUBMERSIBLE MOTOR AND POWER CABLE: The submersible motor shall be of the heat exchanger totally enclosed type suspended below the pump bowl assembly. Power for the motor shall be supplied by a power cable attached to the pump bowl and column assemblies. Motor shall be Byron Jackson, SME or approved equal.

A. Motor: The submersible motor shall conform to the latest AWWA, NEMA and IEEE standards for submersible motors. The motor shall be of the squirrel cage induction type designed with normal starting torque and low starting current for across the line starting. The motor shall be designed for "soft start" starting and reduced voltage autotransformer starting, and capable of continuous underwater operation under the head specified.

The submersible motor shall be in **compliance** with the standards set for by "NSF/ANSI Standard 61: Drinking Water System Components-Health effects," 61-2013 or most recent version. The motor and all its components shall be complaint with NSF/ANSI Standard 61: Drinking Water System Components -Health Effects, 61-2013 or most recent version. All components of the submersible motor shall meet the revised Reduction of Lead in Drinking Water Act. All components shall be in compliance with NSF 61 Annex G, certifying low lead content in line with the Safe Drinking Water Act.

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The motor shall have a horsepower rating of not less than specified and shall have a 110% service factor. The motor shall not be loaded in excess of 95% of its nameplate rating at the rated head and capacity of the pump and shall not be loaded in excess of 100% of its nameplate rating at any condition from zero flow to the maximum capacity of the pump. The motor shall be capable of operating for at least one minute under shutoff conditions.

Heavy-duty thrust bearings shall be provided as an integral part of the motor and shall be of ample capacity to carry the weight of all rotating parts plus the hydraulic thrust in both directions. The bearing shall be of such a size that the average life rating based on continuous operation is no less than seven (7) years. The bearings shall also have the capacity to allow the pump to operate for at least one minute with the discharge valve closed.

The motor shall be designed for operation in a casing of the diameter specified and shall be such that the maximum flow past the motor shall not exceed eight (8) feet per second. Baffles or centralizers shall be provided as part of the motor as required for adequate cooling. The motor shall be provided with a mechanical shaft seal capable of operation at a depth of **800 feet**. Suitable precautions shall be taken to prevent sand, silt and other foreign material from entering the motor.

The motor shall be 316 stainless steel, heat exchanger, 'water filled' or 'oil filled' equipped with (4) PT100 thermal sensors, monitor unit with rated cable and outputs designed to operate with a soft starter, VFD or SCADA.

Power Cable: The power cable to the motor shall be provided by the motor manufacturer and shall be long enough to extend from the water-tight motor connection to a terminal box on the surface plate. For every 50 feet of cable, at least one foot of extra cable shall be allowed to provide for any sag or twist during installation. No splices shall be made below the static water level unless the splice is guaranteed in writing either by the pump manufacturer or the contractor. Provide splice kit data shop drawing. The power cable connection to the motor shall be per manufacturer requirements.

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The cable shall consist of conductors of the size specified, meet voltage requirements, shall be rated for submersible use, and have suitable exterior markings meeting NEC requirements. The cable to be comprised of three conductors and one ground wire with outer jacket, each insulated by an Ethylene Propylene Rubber (EPR) insulation in accordance with clause 72.4 of UL44, rated for 90 degree C, suitable for continuous immersion in water. The three conductors shall be jacketed by an oil and water-resistant Chlorinated Polyethylene Rubber (CPE) extra or extra heavy duty outer jacket meeting all requirements of the latest ICEA NEMA standards for nonmetallic jackets, RoHS compliant, and in accordance with Par. 3.21 of ICEA S-73-81 and UL44, suitable for the voltage provided. The insulated circuit and ground conductors shall be arranged flat and parallel together. The jacket shall be applied directly over the insulated conductors encapsulating them. Conductor shall be soft bare, annealed copper per ASTM 8-3 and ASTM 8-172 flexible, rope-lay stranded. Ground conductor shall be soft bare, annealed copper per ASTM 8-3 and ASTM 8-172 flexible rope-lay-stranded. Insulation EPR 90 degree C and the nominal overall diameter shall equal the insulated circuit conductors. Connect cable grounding conductor at the motor and also in the above ground terminal box.

The cable shall be strapped to the discharge column with 3/4 inch stainless steel straps at 10 foot intervals. 316 stainless steel cable guards shall be provided to protect the cable where it passes over the pump bowls. Appropriate additional cushioning material shall be provided to protect cable during removal and installation. Suitable insulating material shall be wrapped around the cable where the cable is strapped to the column.

Cable shall be Paige Electric P7326-SP 600V Cable or approved equal.

## 10. WELL LEVEL AIR LINE AND LEVEL PROBE CONDUITS

Provide (1) 1/4" I.D. continuous, no joints, stainless steel air line. The air line shall be strapped to the discharge column with 3/4 inch stainless steel straps at 10 foot intervals. The air line shall be accurately measured to the depth of setting when installed. The setting of the air line shall be set to the minimum submergence as specified by the pump manufacturer. The upper end of the air line shall extend above the base of the discharge head assembly.

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Pressurize to submerged pressure and check that no loss for 15 minutes. All measurements shall be logged, recorded, and submitted to the Department of Water.

Provide (1) 1-1/4" PVC Monitoring tube. The monitoring tube shall be strapped to the discharge column with 3/4 inch stainless steel straps at 10 foot intervals. The tube shall be accurately measured to the depth of setting when installed. The setting of the monitoring tube shall be set to the minimum submergence as specified by the pump manufacturer.

## 11. PUMP SLAB

The integrity of the existing pump slab shall be maintained. Any damage done to the pump slab during the removal or installation of the pumping unit shall be repaired by the Contractor at his own expense.

## 12. TESTING OF PUMPING UNIT

The efficiency after the installation and adjustment shall not be less than that specified. Refer to Section "PUMPING UNIT AND APPURTENANCES" - "OPERATING CONDITIONS" There shall be no exceptions.

12.1. Factory Tests: Before delivery the Contractor shall submit to the Department a certificate stating that materials used in the manufacture of the pump assembly, including all pump components, conform to these specifications and that the efficiency of the particular pump ordered and fabricated for delivery has been factory tested and, so determined, was not less than the efficiency specified. The Contractor shall submit five (5) factory certified copies of performance curves and test data sheets of a factory laboratory independent engineering firm or witnessed by the Department via the internet. The curve and data sheet must be approved by the Department of Water Supply, County of Maui before the pump is installed. The test shall be conducted in accordance with the latest edition of the "American National Standard for Deep well Vertical Turbine Pumps – Line Shaft and Submersible Types" ANSI HI 14.6 to show that the specified conditions can be met by the bowl assembly furnished.



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The performance test shall test the pump to include, but not limited to, what is indicated in sections "PUMPING UNIT AND APPURTENANCES – OPERATING CONDITIONS). Upon receipt of a satisfactory certificate showing that the pumping unit will meet the minimum requirements of the Acceptance Grade Tolerance listed below, the Contractor will be permitted to deliver the pump.

Should the test for efficiency result in efficiency less than that specified in "OPERATING CONDITIONS" for the pumping unit, the Contractor shall make the necessary changes and replacements to obtain the required minimum efficiency before the pumping unit leaves the factory. All cost for such changes and replacements will be paid for by the Contractor. The cost of all laboratory tests shall be paid by the Contractor.

- Pump test acceptance grade exceeds all grades under ANSI/HI 14.6. The pumping unit shall conform to the following acceptable grades and tolerances. Corresponding tolerance grade shall be as follows;
  - a. "Rate of Flow: -0% to +5%,
  - b. Total Head: -0% to +3%,
  - c. Efficiency: -0%.
- Minimum of 7 points to include: design, shut-off and five points on curve.
- Head capacity characteristics.
- Power input requirements throughout entire operating range of the pump.
- Pump efficiency over entire operating range of pump.
- Net positive suction head required (NPSHr).
- Overall efficiency of the pumping unit, over a range from zero to 120 per cent of the rated pump.
- Pump speed, size or type, impeller diameter.
- All points resulting from the test and through which the curves are drawn shall be plainly indicated.

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12.2 Field Tests: After installing the pumping unit and appurtenances, a performance test to include a minimum of 7 points; design, shut-off and five points on curve shall be performed to verify factory tests. Throughout the operation test, the pumping unit shall run smoothly free of vibration. If any structural or mechanical defect or weakness develops during the test, or as a result of the test, or if the pump fails to deliver its required discharge under required conditions, the Department of Water Supply, County of Maui reserves the right to reject any part or all of the equipment and demand reconstruction or replacement to meet the requirements of these specifications. All costs for this reconstruction or replacement, including removal, reinstallation, freight, and handling charges shall be paid for by the Contractor.

12.4 Electrical: MDWS shall check and test motor starter and related electrical apparatus to insure proper electrical power and control is acceptable for new pump/motor operations.

12.5 Painting: All existing painted surfaces that has been removed / disturbed, damaged or blemished during the course of the contractors work shall be repainted to match existing.

## 13. GUARANTEE

The equipment covered by these specifications shall be guaranteed against defective parts due to faulty material or workmanship for one (1) year after date of acceptance of project. The Contractor shall guarantee to replace all defective parts within the period of time specified. All costs for the replacement of defective parts including the removal and reinstallation of the pump shall be paid for by the Contractor at no cost to the Department of Water Supply. The guarantee shall be in writing and shall be submitted to the Department Staff for approval prior to completion of the project.

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## 14. TIME OF PERFORMANCE

The Contractor shall proceed with its work in such a manner as is requested by the Director of Water Supply, or his/her designated representative, and shall complete all work required under the agreement within (120) calendar days, exclusive of Department review time, from date of Notice to Proceed, provided that the time of performance may be extended by mutual consent of the parties hereto.

## 15. PAYMENT GUARANTEE

The Contractor guarantees the payment of all just claims for materials, supplies, tools, labor, and other just claims against the Contractor or any subcontractor in connection with this Contract and shall deliver the project free and clear of any liens. Contractor's bonds, if required, will not be released by final acceptance and payment by the County unless all such claims are paid or released, or so much of the monies due or to become due the Contractor under the contract as shall be considered necessary by the Contracting Officer upon recommendation by the Officer-in-Charge may be retained by the County. Should any suit or claim be filed against the Contractor, the County, upon consultation with its attorneys may retain, from any monies due to the Contractor, such amount or amounts as may be deemed necessary by the County, until such suits or claims have been finally settled and determined and upon satisfactory evidence of such settlement of such suits or claims the money retained shall be paid to the Contractor.

## 16. CONTRACT PERFORMANCE AND PAYMENT BONDS

### 16.1. Acceptable Contract Performance and Payment Bonds.

The Contractor shall provide at no cost to the County, contract performance, and payment bonds. Subject to Section 7.4(E) below, acceptable contract performance and payment bonds shall be limited to:

1. Surety bond underwritten by a company licensed to issue bonds in the State of Hawaii;
2. Legal tender; or

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3. A certificate of deposit; credit union share certificate; or cashier's, treasurer's, teller's, or official check drawn by, or a certified check accepted by, a bank, a savings institution, or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Association, and payable at sight or unconditionally assigned to "Department of Water Supply, County of Maui".

a. These instruments may be utilized only to a maximum of \$100,000.

b. If the required security amount exceeds \$100,000, more than one instrument not exceeding \$100,000 each and issued by a different financial institutions shall be accepted.

16.2. When Required. Performance and payment bonds shall be required when the price of the contract is \$25,000 or more and each shall be in an amount equal to one hundred percent (100%) of the amount of the contract price. The Contractor shall deliver the performance and payment bonds to the Department of Water Supply, County of Maui, along with the executed contract. If the Contractor fails to deliver the required performance and payment bonds, the Contractor's award shall be canceled; its bid security enforced, and the Contracting Officer may award the contract to the next bidder.

## 16.3 Bond Forms

16.3.1 The Contractor shall execute the surety performance and payment bond forms provided with the contract.

16.3.2. If the Contractor intends to submit other than surety bonds, the Contractor may request of the Contracting Officer the bond form to be submitted with security other than surety bond, or the Contractor may submit the performance and payment security along with its own bond form.

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## **16.4. Payment Claims against the Bond**

16.4.1. Each person who has furnished labor or material to the Contractor for the work required under the Contract for which a payment bond or a performance and payment bond is furnished under this section, and who has not been paid amounts due before the expiration of a period of ninety (90) days after the day on which the last of the labor was performed or material was furnished or supplied, for which a claim is made, may institute an action for the amount, or balance thereof, unpaid at the time of the institution of the action against the Contractor or Contractor and its sureties, on the payment bond and have his rights and Claims adjudicated in the action, and judgment rendered thereon; subject to the Department of Water Supply, County of Maui priority on the bond.

As a condition precedent to any such suit, written notice shall be given by registered or certified mail to Contractor and surety, within ninety (90) days from the date on which the person did or performed the last labor or furnished or supplied the last of the material for which claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the material was furnished or supplied or for whom the labor was done or performed.

16.4.2. Every suit instituted upon a payment bond shall be brought in the circuit court of the circuit in which the project is located, but no suit shall be commenced after the expiration of one year after the day on which the last of the labor was performed or material was supplied for the work provided in the contract. The obligee named in the bond need not be joined as a party in any suit.

## **16.5 LIQUIDATED DAMAGES**

When the contractor fails to complete the work or any portion of the work within the time or times fixed in the contract or any extension thereof, it is agreed the contractor shall pay to the Department of Water Supply, County of Maui the amount of \$1,000 per calendar day of delay.

AUTHORIZED REPRESENTATIVE

Respectfully submitted,

\_\_\_\_\_  
NAME OF FIRM

\_\_\_\_\_  
SIGNATURE OF BIDDER\*\*

\_\_\_\_\_  
ADDRESS OF FIRM

\_\_\_\_\_  
PRINT OR TYPE NAME OF BIDDER

\_\_\_\_\_  
TELEPHONE NUMBER

\_\_\_\_\_  
PRINT OR TYPE TITLE OF BIDDER

\_\_\_\_\_  
DATE SIGNED

\_\_\_\_\_  
FEDERAL ID/SOCIAL SECURITY #

HAWAII STATE GENERAL EXCISE TAX LICENSE NUMBER \_\_\_\_\_

PLEASE SPECIFY TYPE OF ORGANIZATION:

INDIVIDUAL \_\_\_\_\_ PARTNERSHIP \_\_\_\_\_ CORPORATION \_\_\_\_\_ LIMITED LIABILITY CORP. \_\_\_\_\_

STATE OF INCORPORATION: HAWAII \_\_\_\_\_ OTHER: \_\_\_\_\_ SPECIFY \_\_\_\_\_

\*\* If Corporation, please attach to this page your corporate seal; also evidence of the authority of this officer to submit a bid on behalf of the corporation. Such authority must be in the form of a corporate resolution. Give also the names and addresses of the officers of the Corporation.

(SEAL)