



## DEPARTMENT OF WATER SUPPLY • COUNTY OF HAWAI'I

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DEPARTMENT OF WATER SUPPLY  
COUNTY OF HAWAI'I  
HILO, HAWAI'I

### ADDENDUM NO. 4

MATERIAL BID NO. 2025-16

INVITATION FOR BIDS

FURNISHING AND DELIVERING  
SPARE PUMP AND MOTOR SET

DISTRICT OF NORTH KOHALA  
County of Hawai'i – State of Hawai'i

The following revisions and changes shall be made a part of the contract bidding documents:

#### I. Changes to **PROPOSAL**:

A. Page P-2, **REVISE** Section 1, Item 2, the description should be revised as follows:

“Sun Star Electric 12-inch Type D submersible motor or equal by approval, rated 200 HP @ 2,300 V @ 2-Pole speed, with performance characteristics specified in Special Provisions, Section 304.05, Part B.4.b. Shall be furnished with an MLE of 20.0' length, three (3) heavy copper compression splice reducer for splicing MLE to #4 AWG power cable, and corresponding 316 stainless steel 2-piece cable guards. Contractor shall submit a factory certified witnessed motor curve to the Department for review and approval before the motor will be accepted for delivery.

#### II. Changes to **SPECIAL PROVISIONS**:

A. Page SP-18, **REVISE** Section 304.05, Part B.4., the language for “Submersible Motor” should be revised as follows:

##### 4. *Submersible Motor*

##### a. *General*

- i. *Submersible motor shall be induction type, water-filled suitable for use with the Department's existing soft starter and VFD equipment.*
- ii. *Submersible motor shall be capable of continuously delivering the necessary brake horsepower (BHP) along the complete pump curve.*
- iii. *The motor rating shall be such that at design it will not be loaded beyond nameplate rating and at no place on the pump curve shall the loading exceed the service factor.*

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- iv. *The submersible motor assembly shall be statically and dynamically balanced per ISO 1940/1 to a balance quality grade of G 2.5 (2.5 mm/s) or better.*

b. *Motor Details*

| <i>Motor Details – Group #5</i>             |                |
|---------------------------------------------|----------------|
| <i>Horsepower (HP)</i>                      | <i>200</i>     |
| <i>Voltage (V)</i>                          | <i>2,300</i>   |
| <i>Phase (Ø)</i>                            | <i>3</i>       |
| <i>Full Load Amps (A)</i>                   | <i>55</i>      |
| <i>Nominal Speed (RPM)</i>                  | <i>3,485</i>   |
| <i>Service Factor</i>                       | <i>1.15</i>    |
| <i>Minimum Efficiency @ Full Load (%)</i>   | <i>87.0</i>    |
| <i>Minimum Power Factor @ Full Load (%)</i> | <i>82.0</i>    |
| <i>Maximum Motor O.D. (in)</i>              | <i>10.5625</i> |
| <i>Motor Lead Extension Length (ft)</i>     | <i>20.0</i>    |

c. *Ratings*

- i. *The water-filled submersible motor shall be of a construction suitable for continuous under-water operation in 25.0°C (77.0°F) well fluid with a flow velocity past the motor of 0.5—ft./sec. The motor shall be rated to produce the specified horsepower with specified volts, 60 Hz frequency, 3 phase alternating current power with a minimum service factor of 1.15 (60 Hz). The motor shall be inverter duty rated. All insulating materials will be rated for 155°F or higher. Minimum efficiency at full load shall be as specified with a minimum power factor of 82%.*

ii. *Fill Solution*

- a) *The motor shall be of the water-filled “wet winding” type. The motor shall be filled with a 50/50 solution of water and FDA approved, food-grade propylene-glycol.*

iii. *Shaft Seal System*

- a) *The motor shall be equipped with a double mechanical seal system to seal the motor at the point that the shaft extends through the stator and external casing. The mechanical seals shall be of the rotating face type with SS metallic components and tungsten carbide seal faces. The motor’s top bracket shall be a single cast or fabricated piece configured to form a separate “seal” chamber with a separate drainage/vent line (316 stainless steel) to the bottom of the motor. The seal configuration shall prevent any external fluids that have leaked into the seal chamber from pooling at the inner seal faces. The motor shall be totally enclosed, utilizing an elastomer expansion diaphragm for the equalization of internal an external pressure. The motor shall not require a breather plug or pressure relief valve for proper operation. Single mechanical and mercury type seals are not acceptable.*

iv. *Bearings*

- a) *Replaceable hydrodynamic type carbon composite sleeve bearings, or approved equal, shall be provided at each end of the rotor to maintain the rotor runout to less than .007" TIR.*
- b) *The motor shall be equipped with a genuine Kingsbury tilting "pivotal" shoe type, bi-directional thrust bearing, capable of carrying the weight of all rotating elements plus the hydraulic thrust (upthrust and downthrust) of the pump at shutoff head.*
  - i) *Each tilting shoe shall be capable of individually self-aligning to the thrust driver.*
  - ii) *The thrust bearing assembly shall be insulated to prevent electro pitting.*
  - iii) *The thrust shoe bodies shall be of chrome-copper alloy.*
  - iv) *Thrust shoe and rotor surfaces shall be lapped flat and with a surface roughness of 32  $\mu$ in (Ra) and 12  $\mu$ in (Ra), respectively.*
  - v) *Thrust shoes shall additionally be power scraped after lapping.*

v. *Motor Construction*

- a) *The motor housing and frame shall be of ASTM A351 Gr. CF8M stainless steel and ASTM 312 Gr. 316L. Employment of additive manufacturing (3D printing) via powder bed fusion process shall be acceptable.*
- b) *Rotor shaft shall be of ASTM A479 Gr. XM19 (Nitronic 50) PSQ stainless steel with ends in the bearing area, polished to a surface roughness not exceeding 20.0  $\mu$ in (RA) / 22.0  $\mu$ in (RMS).*
- c) *All fastener and washers shall be Nitronic 60.*
- d) *The motor laser cut or stamped stator and rotor laminations shall be of silicon steel.*
- e) *Rotor laminations shall be keyed to rotor shaft.*
- f) *Windings shall be of oxygen-free high conductivity copper (OFHC) grade CU-OF magnet wire with suitable insulation for compatibility with use of a variable frequency drive.*
- g) *Balance tubing shall be 316L stainless steel.*

vi. *Motor Leads*

- a) *The motor shall be equipped with a detachable, plug-in type lead assembly with one (1) set of three separate, continuous leads. The plug assembly shall be a hot-injection molded plug at the terminal end. The lead assembly plug termination shall form a water-tight seal between the leads and the motor terminal.*

- b) *The motor leads shall have a length of 20'.*
- c) *The motor lead plug in connector shall be pressure tested prior to installation and delivery. The plug in shall be insulation resistance tested after subjected to a minimum of 50 psi of water pressure for one hour.*
- d) *Three (3) heavy copper compression splice reducers for splicing the motor lead extension to the #4 AWG power cable shall be furnished.*

vii. *Motor Coupling*

- a) *The motor manufacturer shall furnish an ASTM A276 Gr. Nitronic 50 stainless steel, one-piece coupling of sufficient size and strength to withstand the torque of the motor and the resistance of the pump.*
- b) *Each side of the motor coupling shall be compatible with the pump shaft and submersible motor shaft, respectively, and shall provide for proper assembly alignment and lateral setting.*

viii. *Mounting Dimensions*

- a) *The motor manufacturer shall disclose all pump end mounting dimensions (flange register dimension, flange bolt pattern and hole size, shaft stick-down height and shaft spline configuration) to the pump manufacturer at the time of submittals.*

d. *Approved Equipment*

- i. *Sun Star Electric 12" Type D*

BY AUTHORITY OF THE DEPARTMENT OF  
WATER SUPPLY COUNTY OF HAWAI'I

Date: October 13, 2025

By:   
Keith K. Okamoto, P.E., Manager-Chief Engineer

***Please sign and return immediately to the Manager-Chief Engineer of the Department of Water Supply.***

Receipt of a copy of **ADDENDUM NO. 4** for MATERIAL BID NO. 2025-16, INVITATION FOR BIDS FURNISHING AND DELIVERING SPARE PUMP AND MOTOR SET, District of North Kohala, County of Hawai'i, State of Hawai'i, is hereby acknowledged.

\_\_\_\_\_  
NAME OF BIDDER

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

By: \_\_\_\_\_