

CONTRACT DOCUMENTS

for

WATER TREATMENT PLANT VFD

PURCHASE CONTRACT NO. MEC-2021-20



CITY OF PORT ANGELES
WASHINGTON

JUNE, 2021

JONATHAN BOEHME, CITY ENGINEER

Prepared by:

A handwritten signature in black ink, appearing to read "Jonathan Boehme".

Jonathan Boehme P.E.
City Engineer

Reviewed by:

A handwritten signature in black ink, appearing to read "William E Bloor".

[William E Bloor \(Jun 4, 2021 15:56 PDT\)](#)

William Bloor
City Attorney



**CITY OF PORT ANGELES
INVITATION TO BID
For
WATER TREATMENT PLANT VFD
MEC-2021-20**

All bids will be received by the Contract Specialist of Public Works & Utilities until **2:00PM, Wednesday, June 23, 2021**, and results will be made available on the City website.

Bids will be taken for the following line items:

1. 450 HP VFD Drive
2. VFD Cooling Fans
3. VFD Technician to assist with installation, communication, programming, startup and training.

The material to be purchased is fully described in Schedule A of the bid documents. Bid documents may be obtained by any of the methods listed below:

- a. City of Port Angeles Website at <http://wa-portangeles.civicplus.com/bids.aspx>
- b. Email Lucy Hanley, Contract Specialist at contracts@cityofpa.us

All bids must be on the forms provided. **All bids must be submitted by email. Faxed bids shall not be accepted.** All questions regarding this bid should be addressed in writing to Lucy Hanley at contracts@cityofpa.us for consideration no later than 5:00 PM on the Thursday preceding the bid cut-off date and time.

The City of Port Angeles (hereafter "City") reserves the right to reject any or all bids and to waive minor irregularities in the bidding process. Subject to the foregoing, the Contract may be awarded to the lowest responsible bidder.

The City of Port Angeles in accordance with Title VI of the Civil Rights Act of 1964, 78 Stat. 252, 42 USC 2000d to 2000d-4 and Title 49, Code of Federal Regulations, Department of Transportation, Subtitle A, Office of the Secretary, Part 21, Nondiscrimination in Federally-Assisted Programs of the Department of Transportation issued pursuant to such Act, hereby notifies all bidders that it will affirmatively ensure that in any contract entered into pursuant to this advertisement, disadvantaged business enterprises as defined at 49 CFR Part 26 will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, national origin, or sex in consideration for an award.

Minority and women owned businesses shall be afforded full opportunity to submit bids in response to this invitation, shall not be discriminated against on the grounds of sex, race, color, age, national origin, sexual orientation, genetic information, or handicap in consideration of an award of any contract or subcontract, and shall be actively solicited for participation in this project by direct mailing of the invitation to bid to such businesses as have contacted the City for such notification. Further, all bidders are directed to solicit and consider minority and women owned businesses as potential subcontractors and material suppliers for this Contract.

PUBLISH: Peninsula Daily News: Tuesday, June 8, 2021



INSTRUCTIONS FOR BIDDERS Equipment Bids

BID SUBMITTAL:

All bids must be submitted via email with the subject line PURCHASE CONTRACT NO. MEC-2021-20. The NAME AND ADDRESS OF THE BIDDER shall appear in the body of the email to contracts@cityofpa.us.

The attached specifications describe the minimum requirements for the equipment requested. All parts necessary to provide a complete unit, meeting all safety requirements, and ready for operation, shall be included in the bid and shall conform in strength, quality of workmanship and material to that usually provided in the general trade. Full descriptive literature should accompany every bid. Any variance from the specifications or standards of quality must be clearly stated in writing by the Bidder.

Do not make reference to brochures or supporting literature on the bid sheet. **All notations for bid compliance or exceptions are to be made on the bid sheet or on a plain piece of paper attached and referenced to the bid item.**

If a bidder's corporate policy mandates use of an official quotation form, it may be submitted. However, the cost data must be duplicated on the City's bid cost data and agreement sheet. **City's bid sheet must be signed by the bidder or its agent in order for the proposal to be accepted.** In cases of errors between bidder's official quotation form and City's bid sheet, the City bid sheet shall govern. If alternate equipment is proposed, bidders are required to submit a separate bid sheet for each unit offered.

All bids must be made on the required bid form and in cases of bid price extension errors, the unit prices will govern. All blank spaces for bid prices must be filled in, with ink or typewritten, and the bid form must be fully completed and executed when submitted. Only one copy of the bid form is required. **Faxed bids will not be accepted.** Failure to adhere to instructions may constitute disqualification of bid.

COMPLIANCE WITH SPECIFICATIONS:

The equipment must be in accordance with the specifications.

Failure on the Bidder's part to comply with any specification herein may be grounds for disqualification of the bid.

All items called for in the specifications, including but not limited to the equipment constructed as shown, and the necessary manuals, must be complete and delivered before the final payment can be processed.

When the description of an item includes both specifications and a brand name and number, the specifications shall govern in case of conflict. Brand name and number are for reference as to the type and quality required and do not preclude offers of a comparable or better product, provided full specifications and descriptive literature accompany the offer.

WARRANTY:

The purchased supplies or equipment furnished must have full manufacturer's warranties, and the warranties must inure to the benefit of the City.

Bidder agrees to these warranty provisions by signing the bid sheet.

SAFETY:

This unit shall completely comply with all State and Federal laws, rules, regulations and codes in effect at the time of delivery.

The unit shall be tested by the successful bidder for compliance with all OSHA/WISHA regulations and the State Department of Labor and Industries Safety Rules.

DELIVERY & ACCEPTANCE:

The successful bidder shall be responsible for delivery to the City's Water Treatment Plant, 3501 W 18th St. Bldg. J, Port Angeles WA, 98363, between the hours of 8:00 AM and 2:30 PM during the City's normal workday.

GENERAL INFORMATION:

The City reserves the right to consider delivery time and may waive any minor irregularities or minor defects or reject any and all bids. Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof. Any bid received after the time and date specified shall not be considered. No bidder will be permitted to withdraw its proposal between the closing time for receipt of proposals and the execution of contract, unless the award is delayed for a period exceeding sixty (60) calendar days. The City may, at its option, in awarding this purchase contract, take into consideration the revenue it would receive from purchasing the equipment from a supplier located within its boundaries, in accordance with RCW 39.30.040.

For the Schedule(s), offers made in accordance with the Invitation to Bid shall be good and firm for the period of **90 calendar days after contract award** unless the bidder specifically limits its offer to a shorter period by written notification on the bid document. However, bids so modified may be declared non-responsive. Quantities shown are of total estimated initial quantities to be ordered. Purchase Orders for additional quantities may be placed with successful bidders over this period from the date of award. Prices bid shall be good for all equipment and materials ordered during that period. All orders shall be placed using City Purchase Orders. Payments shall be made within 30 calendar days from invoice received.

Signing of the bid sheet by bidder and subsequent acceptance by the City of the lowest responsive bid will constitute a binding agreement between the City and bidder. Bidder understands and agrees that **no contract payment** will be made until the City certifies that all stated specifications have been complied with and the equipment is delivered and accepted by the City.

Bids will be evaluated and submitted to the authorized purchasing agent for approval as soon as possible after bid opening. All bidders will be notified of results in writing.

Upon award of the Contract to the successful bidder, the City will send the bidder duplicate, complete sets of Contract Documents, which will include the City's Purchase Order. The Purchase Order will include the final agreed upon price and the specific equipment and options being purchased. The bidder will then sign the duplicate sets of Contract Documents and return them for signing by the City. Each party will retain a fully executed set of the Contract Documents.

By submitting a bid in response to this invitation to bid, bidder accepts all terms and conditions set forth in the Contract Documents. Formal objection is hereby made by the City to any

additional or different terms proposed by bidder as a condition of acceptance or delivery and may be grounds for rejection of the bid by the City.

The Invitation to Bid is released by the City of Port Angeles Public Works and Utilities Department, which shall act as sole point of contact for administration of the bidding. All questions should be in writing to Lucy Hanley, Contract Specialist at contracts@cityofpa.us.



CITY OF PORT ANGELES STANDARD TERMS AND CONDITIONS PURCHASE CONTRACT

THE PURCHASE CONTRACT INCLUDES THE FOLLOWING TERMS AND CONDITIONS AND THE PUBLISHED RULES, REGULATIONS, AND LAWS OF THE CITY OF PORT ANGELES AND THE STATE OF WASHINGTON THAT ARE HEREBY INCORPORATED BY REFERENCE.

1. **CHANGES:** No alteration in any of the terms, conditions, delivery price, quality, quantities, or specifications will be effective without written consent of the appropriate representative of the City.
2. **HANDLING:** No charges will be allowed for handling, including but not limited to packing, wrapping bags, containers or reels, unless otherwise stated herein.
3. **DELIVERY & ACCEPTANCE:** For any exception to the delivery date as specified in this Contract, Bidder shall give prior notification and obtain written approval thereto from the City. Time is of the essence and the Contract is subject to termination for failure to deliver as specified and/or appropriate damages. The acceptance by the City of late performance with or without objection or reservation shall not waive the right to claim damage for such breach nor constitute a waiver of the requirements for the timely performance of any obligation remaining to be performed by bidder.

The successful bidder shall be responsible for delivery to the Water Treatment Plant, 3501 W 18th St. Bldg. J, Port Angeles WA, 98363, between the hours of 8:00 AM and 2:30 PM during the City's normal workday. Delivery shall be made within the time period specified.

4. **DAMAGES FOR DELAY:** Delays add cost to the City in the form of time needed for operational duties, administration and supervision and in the form of replacement equipment rental. Because the City finds it impractical to calculate all of the actual cost of delays, it has adopted the following to calculate liquidated damages for failure to complete the delivery of the equipment/material on time.

Accordingly, the bidder agrees to the following:

- a. To pay liquidated damages in the amount of \$12.50 for each working day beyond the number of working days established for physical delivery of the equipment/material.
 - b. To authorize the City to deduct these liquidated damages from any money due or coming due to the bidder.
5. **PAYMENTS:** Invoices will not be processed for payment until receipt of a properly completed invoice or invoiced items, whichever is later.

6. SHIPPING INSTRUCTIONS: Unless otherwise specified, all goods are to be shipped prepaid, F.O.B. Destination.
7. REJECTION: All goods or materials purchased herein are subject to approval by the City. Any rejection of goods or material resulting from non-conformity to the terms and specifications of this Contract, whether held by the City or returned, will be at bidder's risk and expense.
8. IDENTIFICATION: All invoices, packing lists, packages, shipping notices, instruction manuals, and other written documents affecting this Contract shall contain the applicable purchase contract number.
9. INFRINGEMENTS: Bidder agrees to protect and hold harmless the City against all claims, suits or proceedings for patent, trademark, copyright or franchise infringement arising from the purchase, installation, or use of goods and materials ordered, and to assume all expenses and damages arising from such claims, suit(s) or proceedings.
10. WARRANTIES:
 - a. Notwithstanding inspection and acceptance by the City, the articles supplied under this Contract, or any condition of this Contract concerning the conclusiveness thereof, unless otherwise specified for a different period in Schedule A, the bidder warrants that for a period of one year after delivery and acceptance by the City that:
 - (1) All supplies furnished under this Contract will be free from defects in material or workmanship and will conform with all requirements of this Contract; and
 - (2) The preservation, packaging, packing, and marking, and the preparation for, and method of, shipment of such supplies will conform with the requirements of this Contract.
 - b. When return, correction, or replacement is required, transportation charges and responsibility for the supplies while in transit shall be borne by the bidder. However, the bidder's liability for the transportation charges shall not exceed an amount equal to the cost of transportation by the usual commercial method of shipment between the place of delivery specified in this Contract and the bidder's plant, and return.
 - c. Any supplies or parts thereof, corrected or furnished in replacement under this clause, shall also be subject to the terms of this clause to the same extent as supplies initially delivered. The warranty, with respect to supplies or parts thereof, shall be equal in duration to that in paragraph 10.a of this clause and shall run from the date of delivery of the corrected or replaced supplies.
 - d. All implied warranties of merchantability and "fitness for a particular purpose" are excluded from any obligation contained in this Contract.
 - e. All standard manufacturer warranties must inure to the benefit of the City.

f. Remedies available to the City. Within a reasonable time after providing notice to the bidder, the City may either:

(1) Require, by written notice, the prompt correction or replacement of any supplies or parts thereof (including preservation, packaging, packing, and marking) that do not conform with the requirements of this contract or

(2) Retain such supplies and reduce the contract price by an amount equitable under the circumstances.

11. ASSIGNMENTS: Moneys due under this Contract shall only be assignable with prior written consent of the City.

12. TAXES: Unless otherwise indicated the City agrees to pay all State of Washington sales or use tax. No charge by bidder shall be made for federal excise taxes, and the City agrees to furnish bidder, upon acceptance of articles supplied under this Contract with an exemption certificate.

13. LIENS, CLAIMS AND ENCUMBRANCES: Bidder warrants and represents that all the goods and materials ordered herein are free and clear of all liens, claims, or encumbrances of any kind.

14. RISK OF LOSS: Regardless of FOB point, Bidder agrees to bear all risks of loss, injury or destruction of goods and materials ordered herein that occur prior to delivery. Such loss, injury or destruction shall not release Bidder from any obligation hereunder.

15. HOLD HARMLESS: Bidder shall protect, indemnify, and hold the City harmless from and against any damage, cost or liability for any injuries to persons or property arising from acts or omissions of Bidder, its employees, agents or subcontractors howsoever caused.

16. ANTI-TRUST: Bidder and the City recognize that in actual economic practice overcharges resulting from anti-trust violations are borne by the City. Therefore, Bidder hereby assigns to the City any and all claims for such overcharges.

17. DEFAULT: Bidder shall be liable for damages suffered by the City resulting from Bidder's breach of Contract. The Bidder covenants and agrees that in the event suit is instituted by the City for any default on the part of the Bidder, and the Bidder is adjudged by a court of competent jurisdiction to be in default, Bidder shall pay to the City all costs, expended or incurred by the City in connection therewith, and reasonable attorney's fees. The Bidder agrees that this agreement shall be governed by the laws of the State of Washington, and that venue shall be laid in Clallam County.

18. BRANDS: When a special brand is named it shall be construed solely for the purpose of indicating the standards of quality, performance, or use desired. Brands of equal quality, performance, and use shall be considered, provided the Bidder specifies the brand and model and submits descriptive literature when available.

Any bid containing a brand which is not of equal quality, performance, or use specified must be represented as an alternate and not as an equal, and failure to do so shall be sufficient reason to disregard the bid.

19. **SAFETY:** The equipment shall completely comply with all State and Federal laws, rules, regulations and codes in effect at the time of delivery.

The equipment shall be tested by the successful Bidder for compliance with all OSHA/WISHA regulations and the State Department of Labor and Industries Electrical Workers Safety Rules.

20. **ACCEPTANCE: BY ACCEPTING THIS PURCHASE CONTRACT IN WRITING OR BY DELIVERING THE MATERIAL ORDERED, BIDDER ACCEPTS ALL OF THE TERMS AND CONDITIONS SET FORTH. FORMAL OBJECTION IS HEREBY MADE BY THE CITY TO ANY ADDITIONAL OR DIFFERENT TERMS PROPOSED BY BIDDER AS A CONDITION OF ACCEPTANCE OR DELIVERY.**

PURCHASE CONTRACT

THIS CONTRACT is made and entered into as of the date of the last signature affixed below, between the City of Port Angeles, a non-charter code city and municipal corporation of the State of Washington (hereinafter called the "City") and _____ (hereinafter called the "Contractor," "Vendor," or "Bidder").

WITNESSETH: That the City and the Bidder, in consideration of the performance of the terms and conditions hereinafter mentioned, agree as follows:

ARTICLE I CONTRACT DOCUMENTS

The complete Contract includes the Invitation to Bid, the Instructions to Bidders, the Bid, the Specifications, the Standard Terms and Conditions, the Purchase Order, and the Purchase Contract. The foregoing documents shall hereinafter be called "Contract Documents" or "Contract." All obligations of the City and the Bidder are fully set forth and described herein.

In the event of a discrepancy between any of the Contract Documents, as above defined, the City shall give a written interpretation thereof, which interpretation shall govern.

ARTICLE II CONTRACT COST

The Bidder agrees to sell and deliver to the City, at the delivery point specified in the Instructions to Bidders, and the City agrees to purchase and receive from Bidder the equipment as described and set forth in the Contract Documents and the provisions of the Bidder's bid attached and made a part hereof.

ARTICLE III ASSIGNMENT

The Bidder shall not assign any of its responsibility under this Contract without the express written consent of the City.

ARTICLE IV APPLICABLE LAW AND VENUE

This Contract shall be governed by, and construed in accordance with, the applicable laws of the State of Washington. Any legal proceedings to determine the rights and obligations of the parties hereunder shall be brought and heard in Clallam County Superior Court.

**ARTICLE V
NONDISCRIMINATION**

During the performance of this Contract, the parties shall conduct their business in a manner which assures fair, equal and nondiscriminatory treatment of all persons, without respect to race, creed, color, sex, sexual orientation, genetic information, Vietnam era veteran status, disabled veteran condition, physical or mental handicap, or national origin, and, in particular:

1. The parties will maintain open hiring and employment practices and will welcome applications for employment in all positions from qualified individuals who are members of the above stated minorities.
2. The parties will comply strictly with all requirements of applicable federal, state or local laws or regulations issued pursuant thereto, relating to the establishment of nondiscriminatory requirements in hiring and employment practices and assuring the service of all patrons and customers without discrimination with respect to the above-stated minority status.

**ARTICLE VI
TERMINATION OF CONTRACT**

In the event that any of the provisions of this Contract are violated by the Bidder or the Bidder's subcontractors, the City may serve written notice of intention to terminate such Contract upon the Bidder, which notice shall specify the reasons therefore. Unless within thirty (30) days after serving such notice upon the Bidder such violation shall cease and an arrangement for the correction thereof satisfactory to the City be made, the Contract shall, upon the expiration of the said thirty (30) days, cease and terminate. In the event of any such termination, the City may purchase the materials necessary for complete performance of this Contract for the account and at the expense of the Bidder, and the Bidder shall be liable to the City for any excess cost thereby.

**ARTICLE VII
WAIVER**

Waiver of any breach of any term or condition of this Contract shall not be deemed a waiver of any prior or subsequent breach, no term or condition of this Contract shall be held to be waived, modified, or deleted except by a written instrument signed by the parties hereto.

IN WITNESS WHEREOF, the parties have executed this Contract as the date of the last signature affixed below.

BIDDER

CITY OF PORT ANGELES

By: _____

By: _____

Title: _____

Title: _____

Dated: _____

Dated: _____

ATTEST:

City Clerk

Approved to as to form

City Attorney

GENERAL DESCRIPTION: The City of Port Angeles's Water Treatment Plant 450 HP High Service Pump Motor VFD Failed. This purchase contract is to procure a replacement drive, replacement cooling Fans for existing GE/FUJI P11 VFD's and technical assistance for the installation of purchased equipment.

The Existing (failed) GE/FUJI P11 unit has the following specifications:

450hp
Open type
520A nominal
572A (1 min.)
Model: 6KP1143450X9##
Dimensions: 39.4" H x 26.8" W x 14.2" D
Weight: 308 lbs.

The replacement VFD drive should be a complete unit with all parts, displays, and components necessary to startup and run unit in a continuous use environment.

In addition to the replacement VFD drive the City of Port Angeles has included line item number 2 in the bid package to replace cooling fans on the existing GE/FUJI P11 VFD drives that are still in service.

Replacement Cooling fans model number: FUJI ITEM NUMBER: SP_UT626DG-TP

SITE POINT OF CONTACT ("Project Representative"): Rob Feller at (360) 460-5316

DELIVERY LOCATION: Water Treatment Plant, 3501 W 18th St. Bldg. J, Port Angeles WA, 98363

DELIVERY HOURS: Delivery shall be Monday through Friday, excluding weekends and all legal holidays, between the hours of 8:00 AM and 2:30 PM. Rob Feller, Civil/Utility Engineer I, must be notified 24 hours prior to delivery at 360-460-5316 or rfeller@cityofpa.us

INSTALLATION & STARTUP: The City shall provide an electrician, two laborers and a mechanical lifting mechanism to physically remove the old VFD drive and physically install the new VFD drive. The equipment supplier shall provide a technician to assist with the removal of the old VFD, installation of the new VFD, termination guidance, startup guidance, programming and tuning of the new drive.

SPECIFICATIONS: VARIABLE FREQUENCY DRIVE (VFD)

PART 1: GENERAL

1.01 SUMMARY

- A. This specification provides the requirements for variable frequency AC drives, herein identified as drive, for variable torque pump applications.

1.02 REFERENCES

- A. UL 508C – UL Standard for Safety for Power Conversion Equipment
- B. NFPA 70 – National Electric Code (NEC)
- C. NEMA – Application Guide For AC Adjustable Speed Drive Systems
- D. NEMA ICS 7.1 – Safety Standards for Construction and Guide for Selection, Installation, and Operation of Adjustable Speed Drive Systems

1.03 SUBMITTALS

- A. A submittal package shall be furnished for approval by the Engineer prior to factory shipment of the drive. The submittal package shall consist of the following:
 - 1. Cover sheet containing product features, rated voltage, horsepower, current rating, product model number and equipment tag numbers when applicable.
 - 2. Product outline drawing that provides the overall and mounting dimensions and required clearances for installation.
 - 3. Electrical diagram showing power and control wiring.

1.04 WARRANTY

- A. The manufacturer shall cover the drive under warranty for a period of 36 months from date shipment.

1.05 QUALITY ASSURANCE

- A. The drive manufacturer and distributor shall have 20 years of experience, as a minimum, in the development, design, construction, and application of variable frequency AC drives. Brand labeled drive products shall not be accepted.
- B. The drive manufacturer and local distributor shall have an existing service organization.
- C. The drive manufacturer shall have the ability to perform a complete failure analysis.
- D. The drive unit shall be tested with a motor load.

PART 2: PRODUCT

2.01 MANUFACTURERS

- A. The drives furnished shall be FRENIC-Eco series by Fuji Electric Brand or Equal. Brands of equal quality, performance, and use shall be considered, provided Contractor specifies the brand and model and submits descriptive literature when

available. Any bid containing a brand which is not of equal quality, performance, or use specified must be represented as an alternate and not as an equal, and failure to do so shall be sufficient reason to disregard the bid.

The City of Port Angeles is looking for a “drop in replacement” to minimize cost and modifications to the MCC cabinet. (Schematic 1)

2.02 GENERAL DESCRIPTION

- A. This specification provides the requirements for the variable frequency AC drive, herein identified as drive, to replace a failed Existing GE/FUJI P11 unit with the following specifications:

450hp

Open type

520A nominal

572A (1 min.)

Model: 6KP1143450X9##

Dimensions: 39.4” H x 26.8” W x 14.2” D

Weight: 308 lbs.

- B. New drive unit must fit inside the existing MCC cabinet without modifications and be a direct replacement with matching bolt patterns.

See MCC Schematic 1

- C. The drive shall convert three phase input AC power to an adjustable frequency and voltage output to control the speed of a three phase AC squirrel cage induction motor.
- D. The drive input power section shall utilize a full wave 6-pulse bridge design incorporating diode rectifiers to convert the fixed AC line voltage and frequency to fixed DC voltage. The drive input power section is insensitive to phase sequence of the AC line voltage.
- E. The drive output power section shall change fixed DC voltage to adjustable frequency AC voltage utilizing insulated gate bipolar transistors (IGBT's) producing a PWM output. Soft-switching IGBTs and gate control design shall be utilized to reduce motor terminal dV/dt and allow for motor cable lead lengths as follows without the need for drive output reactors or filters.
1. Motors with 1000V insulation ratings: up to 66ft in cable length
 2. Motors with 1300V insulation ratings: up to 328ft in cable length for drives rated 7.5Hp and above
 3. Motors with 1600V insulation ratings: up to 1312ft in cable length for drives rated 7.5Hp and above

2.03 CONSTRUCTION

- A. The drive shall be of open type construction with the availability of additional covers to meet Type 1 enclosure requirements.
- B. All customer control and power wiring terminals/connections shall be clearly identified; hand written labels are not acceptable. Field wiring torque requirements shall be provided in the drive instruction manual.

2.04 APPLICATION DATA

- A. The drive shall be properly rated and sized to operate a variable torque load.
- B. The drive output frequency range shall be from 0.5Hz to 120Hz.

2.05 ENVIRONMENTAL RATINGS

- A. The drive shall be designed to operate in an ambient temperature of -10C to 50C (14F to 104F).
- B. Storage temperature range shall be -25C to 70C (5F to 140F)
- C. Relative humidity range shall be 5% to 95%, non-condensing
- D. The drive shall be rated to operate altitudes less than or equal to 1000m (3300ft).

2.06 RATINGS

- A. 1 through 900Hp at 460VAC, with a common drive controller platform.
- B. The drive unit shall operate from an input voltage of [380 to 480VAC] with a tolerance of +10% to-15%.
- C. Input frequency shall be 60Hz +/-5%.
- D. Drive displacement power factor shall be 0.97 lagging or higher.
- E. Drive efficiency at 100% speed and load shall be 95% or higher, depending on the drive switching frequency setting.
- F. The drive output current shall be capable of continuous operation at a minimum of 100% rated motor full-load current in accordance with NEC Table 430.250.
- G. The drive overload capacity shall be not less than 120% for 1 minute.

2.07 PROTECTION

- A. The drive shall be UL-508C listed for use on distribution systems with 100kA rms available fault current based upon UL short-circuit testing. The drive shall not require the use of semi-conductor fuses.
- B. The drive shall contain a programmable I²t motor thermal overload protection UL-508C listed and as required by NEC with load and speed sensitive motor protection and include thermal memory retention in the event of an unintentional power loss or shutdown.
- C. The drive shall provide the following protective functions by monitoring, sensing, acting upon, and displaying the type of protective feature activated on the keypad's LED display:
 - Over-current during acceleration
 - Over-current during deceleration
 - Over-current during running at constant speed
 - Ground Fault
 - Overvoltage during acceleration
 - Overvoltage during deceleration
 - Overvoltage during running at constant speed
 - Under-voltage
 - Input phase loss
 - Output phase loss

Over temperature of heat sink
Over temperature of internal control
Over temperature of externally connected device
Over temperature of the motor via motor thermistor input
Drive overload
DC bus fuse open/blown
Abnormal condition in charge circuit
Motor overload
Memory error
Keypad communication error
CPU error
Option card communication error
Option card error
Operational procedure error
Motor tuning or wiring error
RS-485 communication error
Data Save error during under-voltage condition
Power printed circuit board error

- D. The drive shall contain a programmable overload avoidance parameter to reduce or fold back the drive output frequency under an overload condition and be able to provide an output status during this operational condition.
- E. The drive shall contain provisions for programming an output status signal to indicate when the serviceable components on the drive need replacement. This signal shall provide indication for DC bus capacitors, electrolytic capacitors on the printed circuit boards, and cooling fans.
- F. The drive shall be able to display the capacitance of the DC bus capacitors, cumulative run time of the electrolytic capacitor on the printed circuit boards, and cumulative run time of the cooling fans for scheduling of preventative maintenance.
- G. The drive shall contain a momentary power loss ride-through of 15 milliseconds to continue operating the motor under load, longer ride-through times for the drive's control circuitry shall be provided and will be dependent upon the inertia of the connected motor load.
- H. An analog input signal loss detection feature shall be provided and shall be programmable to run at a preset speed or allow the drive to decelerate to a stop and contain the ability to provide an output signal to indicate the signal loss status.
- I. For alarm or fault conditions including: over-current, overvoltage, over-temperature, motor overload, or drive overload, the drive shall provide an automatic reset feature that is programmable for up to 10 reset attempts with programmable reset intervals ranging from 0.5 to 20 seconds.
- J. The drive shall contain input surge protection by utilizing Metal Oxide Varistors (MOVs).

- K. The drive shall contain LED indication for signifying potentially dangerous voltage in present on the DC bus.
- L. The drive shall contain a programmable current limit function; the drive's output frequency shall automatically decrease to maintain the output current below the programmed value.
- M. The drive shall incorporate a programmable motor preheat feature to prevent condensation build up in the motor when it is stopped due to a damp environment or sudden change in surrounding temperature.

2.08 ADJUSTMENTS & CONFIGURATIONS

- A. The drive shall provide a selectable speed reference; keypad, 0-10Vdc analog input, 4-20mA analog input, sum of 0-10Vdc and 4-20mA analog inputs, and UP/DOWN from digital input. A selection between normal and inverse operation in regards the speed reference shall be provided. The drive output frequency accuracy shall be +/-0.2% of maximum frequency at 15C to 35C for analog inputs and +/-0.01% of maximum frequency using the drive's keypad.
- B. Acceleration and deceleration ramp times shall be adjustable from 0 to 3600 seconds. Quantity two independent acceleration and deceleration ramp times shall be available and selectable using a digital input.
- C. The acceleration and deceleration pattern shall be adjustable for: linear, S-curve, or Curvilinear.
- D. The deceleration mode shall be selectable from normal deceleration or coast-to-stop.
- E. The drive shall include a programmable torque boost function to provide additional starting torque, beyond the default starting torque of 50%, as necessary per the application.
- F. In the event of a momentary loss of power, the drive shall be programmable to restart once power is returned
- G. Low and high drive output frequency limits shall be adjustable from 0Hz to 120Hz.
- H. The drive shall be capable of stopping the motor by the selection of DC injection braking. The braking frequency, level, and time shall be programmable.
- I. The drive shall contain adjustable start and stop frequencies in the range of 0.5Hz to 60Hz.
- J. In order to reduce audible motor noise, the drive shall contain adjustable switching frequency with settings ranging from 0.75kHz to 15kHz based on the rating of the drive.
- K. The drive shall provide two programmable analog output signals, that can be selected to output a signal proportional to: output frequency, output current, output voltage, output torque, load factor, input power, PID feedback, DC bus voltage, universal output, motor output, test output, PID process set-point, and PID process output. One analog output signal shall be configurable between 0-10Vdc or 4-20mA and the other analog output signal shall be a fixed 4-20mA output.

- L. The drive shall contain a selectable energy savings function that, when selected, automatically reduces the drive output voltage at steady state operation to the level only required to meet the torque requirement of the load. This function shall also reduce power consumption of the drive to maximize energy savings for both the drive and the motor. The energy savings function shall automatically deactivate during acceleration or deceleration of the load.
- M. The drive shall provide seven (7) programmable inputs with a choice from 36 selectable functions and include the capability to receive negative input logic. The drive programmable inputs shall be configurable for sink or source logic.
- N. The drive shall provide five (5) programmable outputs with a choice from 39 selectable functions and include the capability to provide negative output logic. The drive output types shall include: quantity 1 form C contacts, quantity 1 form A contacts, and quantity 3 open collector outputs.
- O. Detection of low drive output torque shall be provided with the detection level and time programmable.
- P. There shall be three programmable skip frequency operation points with a bandwidth adjustment of 0Hz to 30Hz.
- Q. Motor parameters shall allow manual input of the motor characteristics and the drive shall provide a Motor Auto-tuning feature that automatically adjusts the drive's preloaded motor characteristics to match the actual connected motor characteristics. The Auto-tuning feature shall allow the user to decide if the motor's shaft shall rotate or not during the tuning process.
- R. The drive shall provide selectable cooling fan control to either allow the cooling to continuously run while the drive is powered or to stop the cooling fan from running once the internal temperature inside the drive drops below a predetermined value while the drive is not running but still powered.
- S. The drive shall have the ability to start into a rotating motor, at any speed and direction, then accelerate or decelerate the motor to the speed reference set-point without stopping the motor, tripping the drive, or component failure under normal operating conditions.
- T. A reverse lockout parameter shall be available to prevent the drive from running the motor in the reverse direction.
- U. Automatic deceleration shall be provided to extend the deceleration time where the load inertia causes the DC bus voltage to rise in order to avoid tripping the drive on an over-voltage condition.
- V. PID control shall be incorporated in the drive with the following programmable features: stop frequency and adjustable time delay for low speed (Sleep Mode), starting frequency, upper and lower operational limits, upper and lower alarm limits, normal or inverse operation, process set-point type, and process feedback type.
- W. Multiple pump motor control logic shall be incorporated in the drive to allow the sequence control of multiple pump motors using either a fixed pump motor connected to the drive or alternating the pump motor connected to the drive. Using the fixed pump motor control logic, the drive's pump software shall control the speed of one pump motor and provide sequence control of up to 4 additional

pump motors powered across the line to meet the system flow requirements. Using the alternating pump motor control logic, the drive's pump control software shall provide sequence control of up to 3 pump motors and switch between controlling each of the motors from the drive to across the line in order to meet the system flow requirements.

- X. In addition to the drive being pre-programmed to operate most common applications, the drive shall provide a QUICK-SET programming menu that provides the user with a limited and basic list of parameters that may need adjusted per the application.

2.09 KEYPAD DISPLAY AND INTERFACE

- A. The drive shall contain a backlit graphic liquid crystal display (LCD) and a five-digit LED display. The LCD screen shall display up to 5 lines of text to provide a display for: programming, diagnostics, I/O check, operation status, maintenance information, copy function, and communication debugging. The LED display shall provide indication of: output frequency, output current, output voltage, percent torque, input power, PID process set-point, PID feedback, PID output, load factor, and motor output. The LED display and the LCD display shall function independently of the programming mode to allow programming and monitoring of the drive simultaneously.
- B. The keypad shall provide a separate Local-Remote key to allow switching between local and remote operation modes for the drive.
- C. The keypad shall be common across the entire product series.
- D. The keypad shall be capable of copying drive parameters between different rated drives within the product series. The keypad shall be able to contain three sets of parameter data for copying to different drives or for different application set-ups.
- E. Data protection shall be provided to prevent unauthorized persons from changing the drives parameters through the keypad.

2.10 SERIAL COMMUNICATION

- A. The drive shall contain Modbus RTU as built-in protocol not requiring the use of additional hardware. The user shall be able to select one of these communication protocols via the drive's keypad and programming menu.
- B. Additional communication protocols shall include: Profibus-DP, and Device Net, and Ethernet [IP] ++ OR ++ [Modbus/TCP]

PART 3: INSTALLATION

3.01 INSPECTION

- A. Inspect the product for any signs of physical damage.
- B. Verify that the location is ready to receive the drive and the dimensions are as indicated.
- C. Verify that the enclosure type is suitable for the environment for which it will be installed.

3.02 PROTECTION

- A. Protect the drive from water and other contaminants during storage and installation.
- B. Protect internal components from metal shavings and other wiring/installation debris that might be present during installation.
- C. Scratched painted surfaces are to be repainted to match original color and finish to prevent corrosion.

3.03 INSTALLATION

- A. Technician to assist with the install per manufacturer's instructions and drawings provided.
- B. Technician to verify all motor protective parameters are set correctly, per local and national codes, for the applied motor.
- C. Technician to assist with the termination of all power and communication termination locations per manufacturer's instructions.

3.04 START-UP AND TRAINING

- A. The Technician to assist with startup, drive tuning (if required) and programming to match the existing drive system.
- B. The local (within 125 miles of site) drive distributor shall have factory-trained personnel available for start-up and training.

3.05 DOCUMENTATION

- A. The drive shall be shipped with a printed instruction manual.

END OF SECTION

VERT. BUS A.
 STUB VERT. BUS A. 3000
 VERT. BUS S/U LENGTH
 STUB VERT. BUS S/U LENGTH 2.5
 VERT. STAB GND S/U LENGTH 2.5
 VERT. LOAD GND S/U LENGTH
 CUSTOMER INC. LINE PER PHASE
 8-5000 - 1000 FCM TOP SECT. PA

>-SPlice		S	UL
		DISC	UL
FRONT VIEW		RAH	FEAVT 450
		SPACE	AIM
		RAH	
		SPACE	
		RAH	
		SPACE	
		RAH	
		SPACE	
		RAH	
MOD. SHEET		8	9
SECT. MOD		FRONT 20x22	FRONT 36x22
			56
I-SHIPING LENGTH		0051	
UL SECT. NO.			

CONSUMER & INDUSTRIAL			
HEBANE, NC USA			
CONT. ON SH. L02B		Dwg. NO. 34083332	
SH. L02A		SH. L02A	
MCC EVOLUTION			
Dwg. FOR PRINT APPROVAL			
CUST ITEM NAME: MCC-2			
TOTAL SECTIONS 9			
G-E. RON. S1001404-MC			
ITEM NO. 3			
PANEL CATALOG NO. 0901X0946L02			
CUSTOMER:			
GEXPRO			
USER:			
PORT ANGELES MTP - ORDER			
NEHA CLASS I TYPE BD ENCL. 1G			
POWER SUPPLY 400 VOLTS 60HZ			
3 PHASE 3 WIRE			
CONTROL 120V MC SING WINDING CPT			
AMPS		MATERIAL	
MAIN BUS 2000	COPPER	PLATING	STD TIN
VERT. BUS	COPPER		STD TIN
GND. BUS 3000	COPPER		STD TIN
NEUT. BUS			
BUS BRACING 65000 SYMMETRICAL			
MCC SHORT CRT. RATING 420000 SYM.			
EST. HEIGHT 4500 LBS.			
DRAWINGS AND SHEETS			
STANDARD DRAWING: 34083332			
SPECIAL DRAWING:			
SPEC. SHTS.:			
UNIT IC. SH.:			
PLUG IC. SH.:			
ENGINEER: ASSOC. JOB			
ISSUED 03/04/2008			
REV. NO. 7	REV. 03/05/2008		

Schematic 1

END OF SPECIFICATIONS

CITY OF PORT ANGELES

Bid No. MEC-2021-20

BID FORM WATER TREATMENT PLANT VFD

Bidder must bid on all bid items for a bid to be considered valid. The Bidder hereby bids the following amounts for all material described in the Contract Documents.

Bid Items #	Description Penstock Sluice Gates	QTY (ea.)	Unit Price	Extended Price
1	450 HP VFD Drive	1		
2	FUJI: SP_UT626DG-TP FAN	8		
3	VFD FACTORY TRAINED TECHNICIAN (INSTALLATION, STARTUP, CONFIGURATION, TUNING, TRAINING)	LS		
			Subtotal:	
			Freight	
			Sales Tax (8.8%)	
			Total Bid Amount:	

Delivery	Indicate estimated number of days after the purchase order is received that initial delivery will be shipped to the City, not to exceed 120 days.	Days: _____
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CITY OF PORT ANGELES

BID NO. MEC-2021-20

WATER TREATMENT PLANT VFD

BID SIGNATURE SHEET

(BID SUMMARY and SIGNATURES)

Will you sell additional units to the City of Port Angeles at the bid price until further notice?

Yes No

ADDENDA ACKNOWLEDGMENT: The Bidder hereby acknowledges that it has received Addenda No(s). _____ to this project manual.

The undersigned hereby accepts the terms and conditions as set forth herein. **This bid submittal sheet must be signed and dated by the Bidder or a representative legally authorized to bind the Bidder.**

FULL LEGAL NAME OF BIDDER _____

TYPE OF BUSINESS: Corporation Partnership (general) Partnership (limited)
 Sole Proprietorship Limited Liability Company

ADDRESS _____

CITY/STATE/ZIP _____

PHONE _____ FAX _____

NAME (PLEASE PRINT) _____

TITLE _____

SIGNED _____ DATE _____



BIDDER'S CHECKLIST

1. Have the Bid Submittal Sheets been properly signed, and corporate seal affixed, if applicable?
2. Has the Non-Collusion Affidavit been properly executed?
3. Have all Addenda, if any, been acknowledged on the Bid Submittal Sheet?
4. Has the product descriptive literature been included with the Bid Form?
5. **BID MUST BE SUBMITTED BY THE TIME AND DATE SPECIFIED IN ORDER TO BE CONSIDERED A VALID BID.**









MEC-2021-20 Water Treatment Plant VFD Equipment Purchase

Final Audit Report

2021-06-04

Created:	2021-06-04
By:	Lucy Hanley (lhanley@cityofpa.us)
Status:	Signed
Transaction ID:	CBJCHBCAABAACp4owzzOKI7xBHYcPH0R04p7rfgjpeSk

"MEC-2021-20 Water Treatment Plant VFD Equipment Purchase" History

-  Document created by Lucy Hanley (lhanley@cityofpa.us)
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-  Agreement completed.
2021-06-04 - 10:56:53 PM GMT