

CITY OF BRISTOL



INVITATION TO BID

Please quote us your prices on the commodities or services listed below. All prices must be FOB Destination. You must show Unit Price, Amount and Total or bid may be rejected.

<http://www.bristolct.gov/bids>

Since the City of Bristol is exempt from the payment of Federal Excise Taxes and the Connecticut Sales Tax, do not include such taxes. The City reserves the right to reject in whole or in part any or all bids submitted. The attached standard terms and conditions shall become a part of any resultant contract award.

Vendor Name _____

Address _____

City _____ State _____ Zip _____

Telephone _____

THIS IS NOT AN ORDER. Fill in and return to the address below.

ISSUED BY: City of Bristol, Connecticut	(Return Bid attention of) Roger D. Rousseau	BID NUMBER 2011-039
ADDRESS 111 North Main Street Purchasing Department Bristol, CT 06010		DATE ISSUED October 3, 2010
SHIPPING ADDRESS (address for shipment of purchased materials)		DATE BID REQUIRED October 22, 2010 11:00 am
TELEPHONE NUMBER (860) 584-6195		DATE MATERIAL REQUIRED

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	To be Completed by bidder	
				Unit Price	Amount
	The City of Bristol Water Pollution Control Facility intends to purchase four replacement centrifugal pumps, one each for four pump stations, as per specifications in Attachments A and B.				
1.	Cherry Hill Pump Station (alternate pump)	Ea	1	\$	_____
2.	Matthews Street Pump Station	Ea	1	\$	_____
3.	Mahue Street Pump Station	Ea	1	\$	_____
4.	Ivy Drive Pump Station	Ea	1	\$	_____
				Total:	\$ _____

Please Note:
Responses to this Request For Quotation must be submitted in writing prior to the due date and time noted above, to the address noted above, as a sealed bid response. Responses received after the required due date and time will not be considered for award.
Faxed bid responses are Not Acceptable.

Bids must be enclosed in a sealed envelope, addressed to the City of Bristol and clearly identified as **"Bid 2011-039 Centrifugal Pumps"**

To be completed	QUOTE NO:	DATE SUBMITTED	DELIVERY AS REQ'D. (Unless noted here)	
	SIGNED	TITLE	TELEPHONE NO. & EXTENSION	CASH DISCOUNT PAYMENT TERMS _____ % _____ days, net 30 days
by bidder	VENDOR FEIN/SSN	ARE YOU INCORPORATED YES <input type="checkbox"/> NO <input type="checkbox"/>	PURCHASE ORDER ADDRESS (If different from bidder's address above)	

**City of Bristol, Connecticut
Invitation to Bid 2011-039
Attachment A**

SPECIFICATIONS FOR CENTRIFUGAL PUMPS

INTENT OF SPECIFICATIONS

To purchase four (4) replacement pumps for use in wastewater pumping stations. Under this bid specification the City will be replacing one pump at four existing duplex pumping stations. The stations are located at Cherry Hill Drive, Matthews Streets, Ivy Drive and Boivin Street.

The existing pumps are centrifugal pumps with vertical closed coupled motors. The pumps will be replaced with comparable models. The evaluation of the bids received under this specification will be based on the initial bid price, anticipated installation/retrofit costs for the City to install the proposed pump and the long term electrical costs based on the pumping efficiency of the models submitted under this bid. Toward this end, bid submissions shall include the make and model of each pump proposed by the bidder, dimensional drawings and pump curves showing the pump/motor efficiency at the designated duty point.

A bid alternate is also requested to furnish a rag handling pump for installation at the City's Cherry Hill Drive pumping station.

EQUIPMENT SPECIFICATION

The new pumps shall be closed coupled centrifugal pumps with mechanical seals, configured to operate at the specified duty point, meeting the following specifications:

The proposed pumps shall be of equal or better quality and durability than the existing pump and motor sets currently in use at the stations. Included in this specification is a listing of all existing nameplate data, operating conditions, and design point information. The Bidder shall submit bids to furnish replacement pumps best suited to the existing station operating conditions and configurations.

Pumps shall be non-clog sewage pumps rated to pass 4" spherical solids and shall have iron construction volute and impeller, Stainless steel impeller wear ring and stainless steel case wear ring, suction elbow shall have an access handhole, 125 lb flanges
Furnished complete with mounting base stand

Motors shall be 480v, 3 phase, 60 Hz AC motors, inverter duty, premium efficiency motors, complying with the motor section of this specification.

The existing pump stations are all dry pit/below grade pump chambers of limited size. The pumps proposed under this specification shall have similar dimensions to the existing pumps to minimize installation and retro fit costs. Critical dimensions include but are not limited to; inlet to outlet flange length, elevation difference between inlet and outlet flange centerline, pump base height, overall height and width.

Vender shall provide full shop drawings prior to fabrication to assure compatibility with the existing station configuration.

Bid Alternate:

The City has experienced periodic maintenance problems with the existing pump in operation at its Cherry Hill Drive pump station. The station has been subject to receiving a quantity of disposable wipes in the influent flow large enough to obstruct or accumulate in the pump impellor. The accumulated wipes have on occasion clogged the impellor and disabled the pump. Under this specification the City is requesting alternate bids to provide a rag handling pump in place of the standard pump for this station, as specified above. The alternate pump must be of a size and configuration that can be installed in the station.

DOCUMENTATION

Bidder shall furnish two sets of Operation and Maintenance manuals, including detailed installation instruction, the name and telephone number of the manufacturer's service representative.

WARRANTY

All equipment supplied under this specification shall be warranted for a minimum of two (2) years against defects in material and workmanship. The warranty shall cover all components of the equipment provided under this specification.

Bristol CT Pump Name Plate Information

Cherry Hill PS (Bid alternate to furnish a chopper type pump due to rag material clogging):

Pump Allis Chalmers Counter Clockwise
S/N: 791-3187-1-1
Model: 400
Type: NSVV
Size: 4 x 4 x 10
GPM: 215
RPM: 1760
HD: 62'
Impeller diam.: 8.25

Motor: Gould
Model: 6-341579-01
HP: 10
Type: SC
Frame: S215VP7
RPM: 1745
Volts: 230 / 480
Amps: 25 / 12.5
Service Factor: 1.15
Form: MVB

Station and Forcemain conditions:

Inlet Pipe Diameter: 6"
Discharge Diameter: 6"
Forcemain Dia. and Length: 6" dia, 940 feet long
Station Static Head: 53'

Matthews St Pump Station:

Pump Allis Chalmers
S/N: 751-16150-16150-1-1
Model: 400
Type: NSWV
Size: 8 x 6 x 17
GPM: 1200
RPM: 875
HD: 49'

Motor
S/N: 7-5140-65029-1-1
Model: 115
HP: 25
Type: RGV
Frame: 326VP
NEMA Design: B
RPM: 865
Volts: 230/460
Amps: 69/34.5

Hz: 60
Phase: 3
Service Factor: 1.15
KVA Code: F

Station and Forcemain conditions:

Inlet Pipe Diameter:
Discharge Diameter:
Forcemain Dia. and Length: 12" dia., 1300 feet long
Station Static Head: 35'

Mahue St PS (increasing capacity to 300 gpm at 45' TDH):

Pump Fairbanks Morse
S/N: K2S1064986-1
Size: 4 x 4
Impeller Dia.: 10 1/8"
GPM: 220
RPM: 1150
HD: 40'
Figure: 5433B-28

Motor: Reliance
Model: P25G5064C
HP: 7.5
Type: P
Frame: 254TCZ
NEMA Design: B
RPM: 1165
Volts: 220 / 440

Amps: 20.9 / 10.4
Service Factor: 1.15
KVA Code: H
INS Class: B
Ambient: 40 deg
Cont. Duty

Station and Forcemain conditions:

Inlet Pipe Diameter:
Discharge Diameter:
Forcemain Dia. and Length: 6" dia, 1100 feet long
Station Static Head: 32'

Ivy Dr PS:

Pump/Motor Allis Chalmers
S/N 1-86373-1-1
Model: 400
HP: 5
Type: NSWV-LC
Size: 4x4x10
Impeller Dia.: 9 7/8"
GPM: 100
RPM: 1150
HD: 41

Motor Type GV
Frame: 254UPZ
NEMA Design
RPM:
Volts: 220 / 440
Amps 14.8 / 7.4
Service Factor: 1.15
KVA Code: H
Ambient: 40 deg

Station and Forcemain conditions:

Inlet Pipe Diameter:
Discharge Diameter:
Forcemain Dia. and Length: 4" dia, 420 feet long
Station Static Head: 27'

**City of Bristol, Connecticut
Invitation to Bid 2011-039
Attachment B**

SPECIFICATIONS FOR ELECTRIC MOTORS

ELECTRIC MOTORS

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Motors, up to 200 hp, furnished under other Sections, shall be in conformance with the requirements listed in this Section unless otherwise noted.
- B. Motor shall be inverter duty rated.

1.02 SUBMITTALS

- A. Submittal of motor data for acceptance shall include complete nameplate data and test characteristics in accordance with NEMA Standard MG1-12.54 "Report of Test Form for Routine Tests on Induction Motors" and, in addition, the following for motors typical of the units furnished:
 - 1. Efficiency at 1/2, 3/4 and full load
 - 2. Power factor at 1/2, 3/4 and full load
 - 3. Motor outline, dimensions and weight
 - 4. Descriptive bulletins, including full description of insulation system
 - 5. Bearing design data
 - 6. Special features (i.e., space heaters, temperature detectors, etc.)
 - 7. Power factor correction capacitor rating and type.

1.03 QUALITY ASSURANCE

- A. Routine tests shall be performed on representative motors, and shall include the information described on NEMA MG1-12.54 "Report of Test Form for Routine Tests on Induction Motors". Efficiency shall be determined in accordance with IEEE Publication No. 112, Method B. Power factor shall be measured on representative motors.

1.04 SYSTEM DESCRIPTION

- A. Motors specified herein are three phase, squirrel cage induction type for 1/2

1.05 WARRANTY

- A. The equipment shall be warranted, for a period of 2 years from date of Contractors' certification of installation as defined below, to be free from defects in workmanship, design or material. If the equipment should fail during the warranty period due to a defective part(s), it shall be replaced in the machine and the unit(s) restored to service at no additional cost to the Owner.

PART 2 PRODUCTS

2.01 RATING

- A. Each motor shall develop ample torque for its required service throughout its acceleration range at a voltage 10 percent below nameplate rating. Where shown on the Electrical Drawings to be operated on a reduced voltage starter, the motor shall develop ample torque under the conditions imposed by the reduced voltage starting method.
- B. The motor shall not be required to deliver more than its rated nameplate horsepower, at unity (1.0) service factor, under any condition of mechanical or hydraulic loading.
- C. All motors shall be continuous time rated suitable for operation in a 40 degrees C ambient unless noted otherwise.
- D. Specific motor data such as hp, rpm, enclosure type, etc, is specified under the detailed specification for the equipment with which the motor is supplied.

2.02 ENCLOSURE TYPES

- A. Motors specified herein will conform to one of the following standard enclosure designs:
 - 1. Open Drip Proof
 - 2. Totally Enclosed Fan Cooled (TEFC)
 - 3. Totally Enclosed Non-Ventilated (TENV)
 - 4. Explosion Proof

2.03 NAMEPLATES

- A. The motor manufacturer's nameplates shall be engraved or embossed on stainless steel and fastened to the motor frame with stainless steel screws or drive pins. Nameplates shall indicate clearly all of the items of information enumerated in NEMA Standard MGI-10.38 or MGI-20.60, as applicable.

2.04 CONDENSATION HEATERS

- A. Condensation heaters, where specified under the detailed mechanical specifications shall be of the cartridge or flexible wrap around type installed within the motor enclosure adjacent to core iron. Heaters shall be rated for 120 Volt, single phase with wattage as required. The heater wattage and voltage shall be embossed on the motor nameplate. Power leads for heaters shall be brought out at the motor lead junction box.

2.05 WINDING TEMPERATURE DETECTORS

- A. Winding temperature detectors, where specified under the detailed mechanical specifications for individual equipment shall be a factory installed, embedded, bi-metallic switch type with leads terminating in the main conduit box. This device shall protect the motor against damage from overheating caused by single phasing, overload, high ambient temperature, abnormal voltage, locked rotor, frequent starts or ventilation failure. The switch shall have normally closed contacts. Not less than three detectors shall be furnished with each motor.
- B. Motors connected to variable frequency drives shall be equipped with winding temperature detectors.

2.06 THREE PHASE MOTORS-FRAMES 143T THROUGH 449T

- A. General

1. Unless otherwise specified, motors 1/2 hp and larger shall be 3 Phase, squirrel cage induction type.
2. All motors 3/4 hp and larger shall be a NEMA frame 143T or larger. 1/2 hp motors and 3/4 hp motors rated 1800 and 3600 rpm, shall be a 56 frame. Motors shall be designed and connected for operation on a 480 Volt, 3 Phase, 60 Hz alternating current system. Dual voltage (230/460) rated motors are acceptable.
3. Unless otherwise required by the load, all motors shall be NEMA Design B, normal starting torque. Locked rotor kVA/Hp shall not exceed Code Letter G as described in NEMA Standard MG1-10.37 for motors 20 Hp and larger.
4. Motors connected to variable frequency drives shall be inverter duty rated.
5. Motors shall be by U.S. Electrical Motors, Division of Emerson Electric Co., or equal.

B. Bearings

1. Anti-friction motor bearings shall be designed to be regreasable and initially shall be filled with grease suitable to ambient temperature of [40] degrees C. Bearings shall be ABMA Types BC or RN, heavy duty, or shall otherwise be shown to be suitable for the intended application in terms of B-10 rating life, Class M3 or better.
2. All grease lubricated bearings, except those specified to be factory sealed and lubricated, shall be fitted with easily accessible grease supply, flush, drain and relief fittings. Extension tubes shall be used when necessary. Grease supply fittings shall be standard hydraulic type by the Alemite Division of the Stewart-Warner Corporation.

C. Insulation

1. Insulation systems shall be Class B or Class F, operated at Class B temperature rise and shall be manufacturer's premium grade, resistant to attack by moisture, acids, alkalies and mechanical or thermal shock for 480 Volt motors. Provide 80 degree C, Class B rise or better by resistance at 100 percent load and provide a Class F insulation system, suitable for an ambient temperature motor operation of 0 to 40 degree C at no more than 3300 feet above sea level for medium voltage motors. This temperature rise shall be met when motors are operated and controlled with the VFD(s). The motor insulation system shall have full capability to handle the common mode voltage conditions imposed by the VFD.
2. Motors for outdoor service shall have vacuum/pressure impregnated epoxy insulation for moisture resistance.
3. Insulation for inverter duty motor windings shall meet or exceed the Pulse Endurance Index for magnetic wire and shall not be injured when exposed to repeated pulse type waveforms, repetitive high voltage transients, switching frequency and rate of rise of the pulse. Class H varnish shall be used.

D. Enclosures

1. Motors shall have a steel or cast iron frame, a cast iron or stamped steel conduit box, as specified below and a 1.15 service factor at 40 degrees C. Conduit box shall be split from top to bottom and shall be capable of being rotated to four positions. Synthetic rubber-like gaskets shall be provided between the frame and the conduit box and between the conduit box and its cover. Motor leads shall be sealed with a non-wicking, non-hygroscopic insulating material. A

frame mounted pad with drilled and tapped hole, not less than 1/4-in diameter, shall be provided inside the conduit box for motor frame grounding.

- a. Totally enclosed fan cooled: TEFC motors shall have a steel or cast iron frame, cast iron end brackets, cast iron conduit box, 1.15 service factor at 40 degrees C, tapped drain holes (corrosion resistant plugs for frames 286T and smaller and automatic breather/drain devices for frames 324T and larger) and upgraded insulation by additional dips and bakes to increase moisture resistance.
- b. Totally enclosed non-ventilated: TENV motors shall include the same rating and accessories as specified for TEFC motors.
- c. Explosion proof: Explosion proof motors shall have a cast iron frame, cast iron end brackets, cast iron conduit box, 1.15 service factor at 40 degrees C, tapped drain holes (corrosion resistant plugs for frames 286T and smaller and automatic breather/drain devices for frames 324T and larger) and be UL listed for Class 1, Div. 1, Group D hazardous areas.
- d. Severe duty: Motors shall be of the corrosion resistant type conforming to motors designated by the manufacturer as "Corro-Duty", "Mill and Chemical", "Custom Severe Duty", or similar quality designation. Severe duty motors shall have a cast iron frame, cast iron end brackets, cast iron conduit box and 1.15 service factor at [40] degrees C and tapped drain holes (corrosion resistant plug for frames 286T and smaller and automatic breather/drain devices for frames 324T and larger).
- e. Weather Protected Type I motors shall have open drip proof characteristics with ventilating passages so constructed as to minimize the entrance of rain, snow and air-borne particles to the electric parts. Its ventilating openings shall be constructed as to prevent the passage of a cylindrical rod 3/4-in in diameter. Large motor frames greater than 364 shall also have corrosion resistant screens (guarded), shaft slinger, nipped lead gasket at the conduit box, gasketed severe duty conduit box, internal painting of air gap surfaces, encapsulated winding treatment for moisture resistance and space heaters.
- f. Weather Protected Type II motors shall have all of the features of Weather Protected Type I with its ventilating passages at both intake and discharge so arranged that high velocity air and air-borne particles blown into the machine by storms or high winds can be discharged without entering the internal ventilating passages leading directly to the electric parts.

E. Inverter Duty Rated Motors

1. Inverter Duty Rated: Motors for operation on variable frequency drives shall meet current power quality levels published in NEMA MG1, Part 31 (1993). Consideration shall be given to the primary factors of the variable frequency drive such as the modulation scheme (six-step, PWM, etc), the switching or carrier frequency and the type of power output devices utilized (IGBT etc). Consideration shall also be given to the installation methods such as output cable length, cable installation method, installation of output filters, etc. Enclosures shall be equal to those furnished for severe duty or explosion proof motors. Motor shaft and bearings shall be insulated. Internal service factor shall be 1.0 that of the nameplate. Unless otherwise noted provide enclosures suitable for "severe duty". Motors shall be furnished with an internal thermal switch. Ventilation system shall be designed for maximum heat transfer. Stator laminations shall be stagger-stacked and stamped from high grade electrical steel to minimize eddy-current losses and heat build-up caused by inverter induced harmonics. Rotors shall be configured to minimize skin-effect heating.

F. Motor Efficiencies

1. Three phase motors rated 1 hp and larger shall be of the premium efficiency type. Motors shall have a NEMA Nominal Efficiency not less than the values indicated below. Efficiency values shall be based on tests performed in accordance with IEEE Publication No. 112, Method B. Motors with horsepower or rpm's not listed shall conform to comparable standards of construction and materials as those for listed motors.
2. Where State Energy Codes or Utility Company Energy Rebate Programs dictate higher efficiencies than those listed, the higher efficiency motors shall be furnished.

Full Load Efficiencies
OPEN MOTORS

<u>Hp</u>	<u>3600 RPM</u>	<u>1800 RPM</u>	<u>1200 RPM</u>	<u>900 RPM</u>
	Minimum Nominal Efficiency	Minimum Nominal Efficiency	Minimum Nominal Efficiency	Minimum Nominal Efficiency
3.0	86.5	89.5	89.5	--
5.0	89.5	89.5	89.5	--
7.5	89.5	91.0	91.7	--
10.0	90.2	91.7	91.7	--
15.0	91.0	93.0	92.4	--
20.0	92.4	93.0	92.4	92.4
25.0	93.0	93.6	93.0	92.4
30.0	93.0	94.1	93.6	93.6
40.0	93.6	94.1	94.1	93.6

Full Load Efficiencies
ENCLOSED MOTORS

<u>Hp</u>	<u>3600 RPM</u>	<u>1800 RPM</u>	<u>1200 RPM</u>	<u>900 RPM</u>
	Minimum Nominal Efficiency	Minimum Nominal Efficiency	Minimum Nominal Efficiency	Minimum Nominal Efficiency
3.0	88.5	89.5	89.5	85.7
5.0	89.5	89.5	89.5	89.9
7.5	91	91.7	91.7	90.6
10.0	91.7	91.7	91.7	90.3
15.0	91.7	92.4	92.4	90.7
20.0	92.4	93.0	92.4	91.6
25.0	93.0	93.6	93.0	91.8
30.0	93.0	93.6	93.6	92.7
40.0	93.6	94.1	94.1	93.0

G. Power Factor Correction Capacitors

1. All single speed motors over 5 hp (except motors powered from variable frequency drives) shall be provided with a heavy duty industrial type power factor correction capacitor selected, recommended and furnished by the motor manufacturer to raise the motor power factor to approximately 95 percent. For non-explosion-proof motors, the capacitor shall be mounted on the equipment base plate adjacent to the motor and shall be connected to the motor junction

box with liquid tight flexible conduit. For explosion-proof motors, the capacitors shall be wall mounted in a non-hazardous area.

2. Capacitors shall be dry film or liquid insulated and shall be hermetically sealed in steel enclosures.
3. Each capacitor unit shall be furnished with three high interrupting capacity current limiting fuses. Fuses shall be equipped with "blown-fuse" indicators.
4. Capacitor enclosures shall be suitable for conduit connection. Covers shall be gasketed, bolt-on type.
5. Capacitors shall be UL listed.
6. Capacitors shall be by General Electric Co.; Square D Co. or equal.

H. Alternate Power Factor Correction Equipment

1. Units shall be designed to provide power factor correction in applications subject to the effects of harmonics.
2. Units shall consist of power factor correction capacitors equipped with series inductors. The units shall be tuned to just below the 5th harmonic frequency on systems with predominately 3 Phase loads.
3. Capacitors shall be NEMA rated and tested, shall be non-PCB dielectric, biodegradable, low toxicity, equipped with current limiting fuses, internal discharge resistors and fuse loss indicators. Fuses shall be capable of interrupting a short circuit of 100,000 Amps at 480 Volts, 3 Phase.
4. Inductors shall have low flux density and distributed gaps, copper windings, brazed connections, winding varnish impregnated and baked, Class 220 degrees C insulation with 80 degrees C rise.

END OF SECTION