

HOLBROOK CITY COUNCIL

AGENDA ITEM

ISSUE/ITEM: Discussion/possible action regarding Booster pumps.

DATE OF MEETING: December 18th, 2012

ACTION REQUESTED: Authorization to award bid to Lewus Electric Company.

BACKGROUND: The City has two Booster pumps at the ground level storage tanks. These Boosters draw water from the tanks to the elevated tank to pressurize the system. The City alternates usage between these two boosters to prevent excessive wear. The current pumps are over 30 years old and are starting to vibrate loose from their bases causing failures. In May one of the pumps went down forcing us to use one continuously. At that time the City opened up a bid to replace these pumps with the plan to replace one this year and another one next year. When the bids came in, there was a wide range of costs and products. After several months of talking to the engineers, it has been determined that the bid from Lewus Electric Company is the best bid and it is staff's recommendation that we accept their bid.

There is an estimated 8 week delay in getting the system and the one pump that is running is starting to wear out.

GENERAL PLAN:

IF A BID, LIST VENDORS:

BID SENT TO: Lewus Electric, Carlson and Sons Electric, Pump Systems Inc., Flow products, The Pump Company

BUDGET LINE: 002-091-5058 - Contingencies

FUNDS AVAILABLE: 200,000

Approvals (as required) City Manager _____

Finance Director _____

Booster Pump Bid Break Down

Name	Bid for 2	Bid for 1
The Pump Company	\$51,641.09	\$25,820.55
Flow Products	\$28,668.00	\$14,334.00
Pump Systems	\$21,605.50	\$10,802.75
Carlson and Son's	\$60,194.30	\$28,243.00
Carlson and Son's	\$76,106.58	\$38,053.29
Carlson and Son's	\$54,292.73	\$27,146.37
Carlson and Son's	\$60,372.37	\$30,186.19
Carlson and Son's	\$37,906.00	\$18,953.00
Carlson and Son's	\$41,486.58	\$20,743.29
Lewus Electric Company800gpm*	\$45,750.00	\$0.00
Lewus Electric Company1000gpm*	\$55,797.00	\$0.00
Lewus Electric Company1200gpm*	\$66,892.00	\$0.00

* Lewus system allows us to use one system to replace both boosters



Electric Company, Inc.

1303 Red Baron Rd.
Payson, AZ 85541

Phone: 928-468-6320
Fax: 928-468-6321

6/6/2012

TO: City of Holbrook
465 First Avenue
P.O. Box 970
Holbrook, AZ 86025

FROM: Jim Lewus

Randy Sullivan
Phone: 928-524-6225
Fax: 928-524-2159

Terms: Net 30 Days
Freight: F.O.B. Factory

QUOTATION

QTY	DESCRIPTION	UNIT PRICE	TOTAL
1	AquaForce Station e-SV Pump, 40HP, 3500 RPM DPPE 3STG-66SV31GP4C50N Station Model Number: V3VJF6P31E2K Communication Protocol: None Controls Module: Panel, Mid-Tier, Triplex, VS,460-3P, 40 HP-650-000-099 Mechanical Module: AMERICAS, BSTR, 66SV, 92SV, SM, 39R, VS-600-003-164 Options: SUCTION PRESSURE TRANSDUCER, 0-300 PSI Header Size: 8.0 Basic Criteria: Number of Pumps: 3 System Flow: 1,200.0 gpm Flow Split 33% P-1 33% P-2(3/4) Station Discharge Pressure: 87.0 psi g Suction Type/Pressure: Flooded 1.0 ft Station Losses: 5.0 psi g Input Power: 460V/3ph Cycles: 60 Hz/3,500rpm 157.0 full Load Amps Lead Time: RTF Start up fee includes; Technician 2 hours System start-up for 1 Aquaforce Unit 1 hour System training Tech. travel and mileage	\$66,892.00	\$66,892.00
			\$900.00
This quote is based on us supplying the AquaForce Booster Stations and start up only. All plumbing and electrical preparation needs to be done by others. Thank you for the opportunity to quote you on your project.			



GICON PUMPS & EQUIPMENT

June 5, 2012

Proposal No: DG12-06-05 01

Item No: ITEM 001

Job:

Series: e-SV Size: 66SV QTY: 1 Stage No: 3 Reduced Stages: 1

Operating conditions

SERVICE

LIQUID

CAPACITY 1,200.0 gpm

HEAD 211.5 (ft)

Performance at 3500 RPM

PUBLISHED EFFY 70.1% (CDS)

RATED EFFY 70.1%

RATED POWER 30.50 hp (Run out 32.9 hp)

NPSHR 12.3 ft

STATION DISCHARGE PRESSURE 87.0 psi g (0.0 psi g @ Shut off) Based on 0.4 psi g Suc.press

PERF. CURVE 66SV-3600-LNPSH-0

SHUT OFF HEAD 383.3 ft

Quoted Features

CONSTRUCTION CI-304

MECHANICAL SEAL Carbon/Silicon Carbide/Viton

OPTIONS Low NPSH only

Driver : Electric motor Manufacturer : Factory Choice

FURNISHED BY Pump Mfg

MOUNTED BY Pump Mfg

RATING 40.0 hp (29.8 KW)

ENCLOSURE DPPE

PHASE/FREQ/VOLTS 3/60 Hz/230/460

SPEED 3600 RPM

INSULATION/SF

FRAME 280TC

MOTOR PART NO V17A32F4BL2S

Program Version 1.38.0.0



Submittal Data

Multi-Stage Pumps

MODEL : V3VJF6P31E2K

Hydraulic Data					Motor Data	e-SV Vertical Model	Qty.
Maximum Flow	Flow at Duty Point	Maximum TDH	TDH at Duty Point	NPSHR	Voltage/Phase/Enclosure		
448.9 gpm	1,200.0 gpm	383.3 ft	211.5 ft	12.3 ft	230/460V 3 PH DPPE	V3VJF6P31E2K	1

Submittal Prepared for: GICON PUMPS & EQUIPMENT

Engineer:

Submittal Prepared by: Debbie Gardner

Submittal Date: June 5, 2012

Job:

Contractor:

Company:

Approved by:

Proposal No: DG12-06-05 01

Item No: ITEM 001

Date: June 5, 2012

Engineering Data

Pump Code: V3VJF6P31E2K

Pump Size: 66SV

Stage No: 3

Reduced Stages: 1

Pump Horsepower at Rating Point: 30.50 hp

Pump Shut Off Head: 383.3 ft

Efficiency: 70.1 %

Motor Speed: 3600

System Input Power: 3 / 230/460 V

Motor Rated Horsepower: 40.0 hp

Max.Frequency: 60Hz

Frame Size: 280TC

Motor Part No: V17A32F4BL2S

Discharge Size: 4.00 in

Impeller Construction: CI-304

Impeller Type: Radial Impeller

Shaft Seal: Carbon/Silicon Carbide/Viton

Options: Low NPSH only

Standard Equipment / Capability:

PUMP

The e-SV pump is a non-self priming vertical multistage pump coupled to a standard motor. The liquid end, located between the upper cover and the pump casing, is held in place by tie rods. The pump casing is available with different configurations and connection types.

- Delivery: up to 700.0 gpm/ Head: up to 1200. ft
- Temperature of pumped liquid: -20.0 deg F to 250.0 deg F standard version
- Direction of rotation: clockwise looking at the pump from the top down (marked with an arrow on the adapter and on the coupling).

MOTOR

- Standard NEMA 280TC Frame motor in open drip proof
- 3600 RPM nominal
- Three phase version, 2 pole: 230/460 V, 60Hz, 40.0 hp
- Vertical multistage centrifugal pump. All metal parts in contact with the pumped liquid are made of stainless steel.
- G-Cast Iron/304SS AISI Round Flange with 580.0 psi g MAWP
- Reduced axial thrusts enable the use of standard NEMA TC motors that are easily found in the market
- Seal housing chamber designed to prevent the accumulation of air in the critical area next to the mechanical seal
- Mechanical seal according to EN 12756 (ex DIN 24960) and ISO 3069
- Versions with ANSI flanges that can be coupled to ANSI counter-flanges
- Threaded oval counter-flanges made of stainless steel are standard supply for the T versions
- Easy maintenance. No special tools required for assembly or disassembly
- Standard version for temperatures ranging from: 0 deg F to 250 deg F (optional to 300 deg F)



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PART 1 - GENERAL

1.1 SECTION INCLUDES:

- A. Variable Speed Pumping Package
- B. Pump Control Panel
- C. Variable Frequency Drive
- D. Sensor Transmitters
- E. Sequence of Operation

1.2 REFERENCES

- A. AWWA - American Water Works Association
- B. ANSI - American National Standards Institute
- C. ASTM - American Standards for Testing Materials
- D. HI - Hydraulic Institute
- E. ASME - American Society of Mechanical Engineers
- F. UL - Underwriters Laboratories
- G. ISO - International Standards Organization
- H. NEMA - National Electrical Manufacturers Association
- I. ETL - Electrical Testing Laboratories
- J. CSA - Canadian Standards Association
- K. NEC - National Electrical Code
- L. IEC - International Electrotechnical Commission
- M. NSF - NSF International

1.3 SUBMITTALS

A. Submittals shall include the following:

- 1. System summary sheet
 - 2. Sequence of operation
 - 3. Shop drawing indicating dimensions, required clearances and location and size of each field connection
 - 4. Power and control wiring diagrams
 - 5. System profile analysis including variable speed pump curves and system curve. The analysis shall also include pump, motor, job specific load profile, staging points and VFD efficiencies horsepower and kilowatt/hour consumption.
 - 6. Pump data sheets
- B. Submittals must be specific to this project. Generic submittals will not be accepted.

1.4 QUALITY ASSURANCE

- A. The pumping package shall be assembled by the pump manufacturer. An assembler of pumping systems not actively engaged in the design and construction of centrifugal pumps shall not be considered a pump manufacturer. The manufacturer shall assume "Unit Responsibility" for the complete pumping package. Unit responsibility shall be defined as responsibility for interface and successful operation of all system components supplied by the pumping system manufacturer.
- B. The manufacturer shall have a minimum of 30 years experience in the design and construction of packaged pumping systems, and over 50 years in active design/ production of centrifugal pumps.
- C. All functions of the variable speed pump control system shall be tested at the factory prior to shipment.
- D. Bidders shall comply with all sections of this specification relating to packaged pumping systems. Any deviations from this specification shall be bid as a voluntary alternate clearly defined in writing. If no exceptions are noted, the supplier or contractor shall be bound by these specifications.
- E. A copy of manufacturer's certificate of insurance showing as a minimum, general liability coverage of \$1,000,000, and an excess liability coverage of \$10,000,000.
- F. The pumping package shall be certified by an approved independent testing and certification organization as being compliant with the requirements of NSF/ANSI 61 for potable drinking water and NSF-61 Annex G for low lead content.
- G. Manufacturer shall be listed by UL as a manufacturer of packaged pumping systems under UL/cUL category QCZJ.
- H. Manufacturer shall be listed by UL as a manufacturer of control panels under UL 508A.
- I. The manufacturer's production facility shall be certified by an approved independent testing and certification organization as being compliant with the requirements of NSF/ANSI 61 and NSF-61 Annex G. The manufacturing facility shall be subjected to periodic inspections and audits.

Part 2 PRODUCTS

2.1 Acceptable Manufacturers

- A. Subject to compliance with these specifications, the following manufacturers shall be acceptable:
- 1. ITT Goulds
 - 2. Pre-approved equal



2.2 Manufactured Units

- A. Furnish and install as shown on the plans a Variable Speed System model number V3VJF6P31E2K as manufactured by ITT Goulds or approved equal. System shall be capable of delivering 1,200.0 gpm at 87.0 psi g with a 1.0 ft minimum suction pressure. Suction and discharge headers shall be 8.0 in and constructed of 304 series stainless steel.
- B. Manufacturer shall be listed by Underwriters Laboratories as a manufacturer of packaged pumping systems.
- C. The entire pumping package shall be NSF/ANSI/NSF-61 certified for potable drinking water and NSF-61 Annex G for a wetted area, weighted average lead content =0.25%.
- D. The control system shall include, as a minimum, the programmable logic station controller, variable frequency drives, a manifold mounted 4-20mA pressure transducer and any additional equipment as specified or as required to properly execute the sequence of operation.
- E. System shall require only suction, discharge and drain connections and single point power connections with service entrance disconnect functionality.
- F. All components shall be mounted and shipped as a single unit.
- G. Pumps shall be manufactured by ITT.
- H. The discharge of each pump shall be fitted with a control valve appropriate for station operation. Each pump and discharge valve assembly shall also be equipped with isolation valves so that the pump can be serviced while system is still filled.
- I. Pressure gauges shall be installed on the suction and discharge headers.
- J. Piping shall be sized so that water velocity shall not exceed 10.0 ft/sec in either the branches or manifolds.
- K. Pumps shall be protected from thermal accumulation via individual thermal relief mechanisms.

2.3 Components

A. AquaForce Variable Speed Pump Logic Controller

1. The AquaForce VS pump logic controller assembly shall be listed by and bear the label of Underwriter's Laboratory, Inc. (UL/cUL). The controller shall be specifically designed for packaged pressure booster applications.
2. The pump logic controller shall be microcomputer based and hold its software in non-volatile memory. On-line field modified data entries, such as stage point, alternation, serial communication, and sensor setup, as a minimum, shall be stored in flash memory with capability to prevent accidental loss of data due to voltage surge or spike. In the event of a complete power outage, all factory preset or last saved data values remain stored and available for recall by the operator.
3. The variable speed pump controller shall function to a proven program that safeguards the pumps/system against damaging hydraulic conditions including:
 - a. Motor Overload
 - b. Pump Flow Surges
 - c. Hunting
 - d. Integral Curve Limiting Feature: The pump logic controller shall automatically protect the system from overload through frequency/current optimization.
4. The pump logic controller shall be capable of accepting individual analog inputs from zone sensor/transmitters as indicated on the plans. Analog input resolution shall be 12-bit minimum, and the controller shall scan each analog input a minimum of once every 100 milliseconds. Use of a multiplexer for multiple sensor inputs is not acceptable. All sensor/transmitter inputs shall be individually wired to the pump logic controller for continuous scan and comparison function. All analog inputs shall be provided with current limit circuitry to provide short circuit protection and safeguard against incorrect wiring of sensors.
5. Hydraulic stabilization program shall utilize a proportional-integral-derivative control function. The proportional, integral and derivative values shall be user-adjustable over an infinite range. The scan and compare rate that selects the command set point and process variable signal shall be continuous and automatically set for optimum performance. Each sensor shall be scanned at least once every 100 milliseconds.
6. The pump logic controller shall be self-prompting. All messages shall be displayed in plain English. The following features shall be provided: Multi-fault memory and recall On-screen help functions LED pilot lights and switches Soft-touch membrane keypad switches
7. The variable speed pumping controller shall be provided with a user friendly operator interface complete with membrane switches and numeric keypad. Display shall be no less than four lines with each line capable of displaying up to twenty characters. The human interface panel shall display the following values:
 - a. Pump On/Off Status
 - b. Pump % Speed
 - c. Individual Alarm Conditions
 - d. Troubleshooting Diagnostics
 - e. User-adjustable parameters such as alternation, PID, set points, etc.
8. The system shall utilize the QuickStart feature to simplify programming and startup of the pump control system. The feature shall be specific to pump systems and use suitable pump terminology.
9. A data-logging feature shall be provided as a function of the pump logic controller. The Alarm log shall include the last 40 alarms with date/time stamp. The Pump data log shall display individual pump run timers and pump cycle counters. A Signal log shall be provided to display the maximum and minimum values with date/time stamps for each process variable.
10. The Logic controller shall incorporate a Flash Memory for saving and reloading customized settings. These field determined values shall be permanently retained in Flash memory for automatic reloading of the site specific setup values in the event of data corruption due to external disturbances. The Controller shall also employ a sensor setup copy feature.
11. The pump controller shall be capable of communicating with the Building Automation System (BAS) by both hard-wired and serial communications. The following communication features shall be provided to the BAS in hardwired form via 4-20ma analog output signals and digital input/outputs:
 - a. Remote system start/stop (dry contact supplied by BAS)
 - b. General Alarm (qty. 1, relay output from pump controller)
 - c. Process variable or VFD speed (qty. 1 4-20ma analog output supplied by pump controller)
 - d. System on/off status (qty. 1 relay output supplied by pump controller)
12. The following communication features shall be provided to the Building Automation System via an onboard RS-485 port utilizing None protocol:
 - a. All sensor process variables
 - b. Individual zone set points



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- c. Individual pump failure
- d. Individual pump on/off status
- e. Individual VFD on/off status
- f. VFD speed
- g. Individual VFD Failure
- h. Individual sensor failure

13. The pump logic controller shall be an ITT AquaForce VS pump controller. Enclosure shall be NEMA 1 with NEMA 4 rated operator interface.

Variable Frequency Drive

1. The Drive shall be rated to operate from 3-phase power at 208VAC to 600VAC, +10% / -15%, 48Hz to 63Hz. The drive shall employ a full wave rectifier to prevent input line notching and operate at a fundamental (displacement) input power factor of 0.98 at all speeds and nominal load. The drive efficiency shall be 98% or better at full speed and load. An internally mounted AC line reactor or DC choke shall be provided to reduce input current harmonic content, provide protection from power line transients such as utility power factor correction capacitor switching transients and reduce RFI emissions. When a DC choke is utilized it shall be of swinging choke design to mitigate harmonics substantially more than conventional choke designs and shall provide equivalent to 5% impedance. Unit shall be the ABB ACS 550 Series manufactured by ABB Drives & Power Products.

2. The VFD, including all factory-installed options, shall have UL and cUL approval.

3. Enclosure shall be NEMA 1 ventilated for installation as a wall mounted or freestanding unit, depending on the amp rating. Drive shall be equipped with an integrated fusible disconnect switch, pad lockable in the open position for safety during maintenance, and fuses to protect against ground faults.

4. VFD shall utilize a full wave rectifier to convert three phase AC to a fixed DC voltage. Power factor shall remain above 0.98 regardless of speed or load. VFD's employing power factor correction capacitors shall not be acceptable.

5. An internal line reactor (5% impedance) shall be provided to lower harmonic distortion of the power line and to increase the fundamental power factor.

6. The VFD shall be suitable for elevations to 3300. ft above sea level without derating. Maximum operating ambient temperature rating shall not be less than 104 deg F. VFD shall be suitable for operation in environments up to 95% non-condensing humidity.

7. The VFD shall be capable of displaying the following information in plain English via an alphanumeric display:

- a. Output Frequency
- b. Output Voltage
- c. Motor Current
- d. Kilowatts per hour
- e. Fault identification with text
- f. Percent torque
- g. Percent power
- h. RPM

8. The VFD shall have the ability to automatically restart after an over-current, overvoltage, under-voltage, or loss of input signal protective trip. The number of restart attempts, trial time, and time between reset attempts shall be programmable.

9. Three (3) programmable critical frequency lockout ranges to prevent the VFD from operating the load continuously at an unstable speed.

10. Operator Control Panel (Keypad)

a. Each VFD shall be equipped with a front mounted operator control panel (keypad) consisting of a backlit, alphanumeric, graphic display and a keypad with keys for Start/Stop, Local/Remote, Up/Down and Help. Two (2) Softkeys will be provided which change functionality depending upon the position within the parameter hierarchy or state of panel.

b. All parameter names, fault messages, warnings and other information shall be displayed in complete English words or Standard English abbreviations to allow the user to understand what is being displayed without the use of a manual or cross-reference table.

c. The Display shall have contrast adjustment provisions to optimize viewing at any angle.

d. The control panel shall provide a real time clock for time stamping events and fault conditions.

e. The control panel shall include a feature for uploading parameter settings to control panel memory and downloading from the control panel to the same Drive or to another Drive.

f. All Drives throughout the entire power range shall have the same customer interface, including digital display, and keypad, regardless of horsepower rating.

g. The keypad shall be able to be installed or removed from the drive while it is powered, capable of remote mounting, and shall have its own non-volatile memory.

11. Protective Functions

a. For each programmed warning and fault protection function, the Drive shall display a message in complete English words or Standard English abbreviations. The three (3) most recent fault messages along with time, current, speed, voltage, frequency and DI Status shall be stored in the Drive's fault history. The last ten (10) fault names shall be stored in Drive memory.

b. The Drive shall include internal MOV's for phase to phase and phase to ground line voltage transient protection.

c. Output short circuit withstand rating and ground fault protection rated for 100,000 AIC shall be provided per UL508C without relying on line fuses. Motor phase loss protection shall be provided.

d. The Drive shall provide electronic motor overload protection qualified per UL508C.

e. Protection shall be provided for AC line or DC bus overvoltage at 130% of maximum rated or under voltage at 65% of min. rated and input phase loss.

f. A power loss ride through feature will allow the Drive to remain fully operational after losing power as long as kinetic energy can be recovered from the rotating mass of the motor and load.

g. Output short circuit withstand rating and ground fault protection rated for 100,000 AIC shall be provided per UL508C without relying on line fuses. Motor phase loss protection shall be provided.

h. The Drive shall provide electronic motor overload protection qualified per UL508C.

i. Protection shall be provided for AC line or DC bus overvoltage at 130% of maximum rated or under-voltage at 65% of min. rated and input phase loss.

j. A power loss ride through feature will allow the Drive to remain fully operational after losing power as long as kinetic energy can be recovered from the rotating mass of the motor and load.



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12. Electrical

a. Pump Logic Controller Enclosure. Main station disconnect shall have a through door operator and shall be sized as shown in the technical data sheet. Individual integrated fusible drive disconnects shall have exterior operators, and shall be sized as shown in the technical data sheet. Station disconnect panel shall be housed in a NEMA 1 enclosure with integral latches. The control enclosure shall be constructed of 14-gauge steel and the back plate assembly shall be constructed of 14-gauge steel.

b. Controls and Enclosure. The control panel with controls shall be built in accordance with NEC, and shall comply with UL standards. Pump station manufacturer shall be authorized under UL508A to manufacture its own control panels. All equipment and wiring shall be mounted within the enclosure and each device shall be labeled with proper identification. All adjustments and maintenance shall be accessible from the front of the control enclosure. A complete wiring circuit diagram and legend with terminals, components, and wiring completely identified shall be provided. Main disconnect shall be interlocked with door.

13. Sensor / Transmitters

a. Pressure transducer shall be utilized for providing all pressure signals for the pump control logic. Pressure transducer shall be a solid-state bonded strain gage type with an accuracy of $\pm 0.5\%$ BFSL and constructed of 316 stainless steel. Transducer shall be rated for a pressure of 300 psi and shall provide gauge pressure output, rather than an absolute. Pressure transducer constructed of plastic is not acceptable. Pressure transducer shall be 4-20mA analog type with 10-28 VDC supply range and utilize a packard type connector to prevent moisture intrusion.

14. Flowmeter, when specified and shown in the plans

a. Provide an ITT ST-104 field mounted flow sensor transmitter as indicated on the plans. Unit shall transmit an isolated 4-20 mA dc signal indicative of process variable to the pump logic controller via standard two wire 24 VDC system. Unit shall consist of an insertion probe and separately mounted transmitter. The unit shall be accurate to within 1% of flow rate from 1.0 ft/sec to 30.0 ft/sec and shall withstand a static pressure of 200.0 psi g with negligible change in output.

15. Variable Speed System Sequence of Operation

a. The system shall consist of a Technologic 1500 pump logic controller with multi-pump parallel operation control, duty-standby pump selection, automatic alternation and automatic transfer to the standby pump upon pump/VFD failure.

b. The pumping system shall start upon the closure of customer's contact when the pump logic controller Mode of Operation is in REMOTE.

c. When the pump logic controller mode in LOCAL, the pumping system shall operate automatically.

d. Each sensor/transmitter shall send a 4-20mA signal to the Technologic 1500 pump logic controller, indicative of process variable condition.

e. When the set point is satisfied by the process variable, the pump speed shall remain constant at the optimum energy consumption level.

f. The pump controller shall automatically start the lag pumps as necessary to satisfy system demand.

g. As demand is satisfied, the controller shall automatically stop lag pumps as necessary to conserve energy.

h. In the event of a pump failure or a VFD fault, the pump logic controller automatically initiates a timed sequence of operation to start the redundant pump/VFD set in the variable speed mode.

i. In the event of the failure of a zone sensor/transmitter, its process variable signal shall be removed from the scan/compare program. The redundant zone sensor/transmitters, if available, shall remain in the scan/compare program for control.

j. PUMP or VFD fault shall be continuously scrolled through the display on the operator interface of the pump logic controller until the fault has been corrected and the controller has been manually reset.

k. When the system is satisfied, the pump controller shall shut down the single running lead pump and enter energy saving / no flow shutdown mode.

E. Pumps

F. Station Frame. The pump station frame shall be designed and fabricated to provide structural support for all attached equipment, and provide anchor bolt support. The base shall supply sufficient rigidity to withstand the stresses of reasonable and competent transportation to site, off loading, installation, and operation.

G. All piping shall be constructed from 304 stainless steel, schedule 10 or heavier pipe as required to maintain a 3 to 1 pressure safety factor (including 0.062 in corrosion allowance).

H. Isolation ball valves.

1. Isolation ball valves shall be certified to NSF-61 for use with potable drinking water.

2. Isolation ball valves shall be certified as low lead having wetted surface area with a weighted average lead content < 0.25%.

3. Valves shall be rated for 600.0 psi g WOG / 150.0 psi g WSP for valves 0.25 in to 2.0 in and 400.0 psi g WOG / 125.0 psi g WSP for valves 2.5 in to 4.0 in.

4. Seats and stem packing shall be virgin PTFE. Stem shall be bottom loaded blowout proof design with fluorocarbon elastomer O-ring to prevent stem leaks.

5. Valves shall be 2-piece full port design.

I. Isolation Grooved Butterfly Valves.

1. Valves shall be certified to NSF-61 for use with potable drinking water.

2. Valve bodies shall be investment cast C8FM to ASTM A743 with integral neck and ISO mounting top.

3. Valve handle shall be a 304 stainless steel.

4. The disc shall be a dual-seal type, encapsulated either with Gr. E EPDM for cold and hot water services.

5. Valves shall be rated for 300.0 psi g CWP

J. Isolation lug style butterfly valve.

1. Valve shall be certified to NSF-61 for use with potable drinking water.

2. Valve body shall be made of ASTM 536 ductile iron and will be coated with an FDA approved epoxy. Valve face to face dimensions shall comply with API 609 and MSS-SP-67.

3. Disc shall be made of ASTM A-351 stainless steel. Shaft shall be made of 316SS.

4. Bushing shall be made of a Teflon®-Darcon inner liner bonded to fiberglass-epoxy resin outer shell.

5. Seat shall be EPDM.

6. Valve shall be rated to 200.0 psi g WOG.

K. Threaded check valves.

1. All valve metallic components shall be 316SS.

2. Seat shall be Viton.



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3. Valve shall be rated for 400.0 psi g WOG.

L. Wafer check valves.

1. The valve body shall be constructed of ASTM A126 Class B cast iron for Class 125/150 and Class 250/300 valves.

2. The seat and disc shall be ASTM B584 Alloy C83600 cast bronze or ASTM B148 Alloy C95200 aluminum bronze.

3. The compression spring shall be ASTM A313 Type 316 Stainless Steel with ground ends.

4. Valve interiors and exteriors shall be coated with an NSF/ANSI-61 certified fusion bonded epoxy in accordance with AWWA C550.

5. The exterior of the valve shall be coated with a universal alkyd primer.

6. The valve design shall incorporate a center guided, spring loaded disc, guided at opposite ends and having a short linear stroke that generates a flow area equal to the nominal valve size.

7. The operation of the valve shall not be affected by the position of installation. The valve shall be capable of operating in the horizontal or vertical positions with the flow up or down.

8. All component parts shall be field replaceable without the need of special tools. A replaceable guide bushing shall be provided and held in position by the spring. The spring shall be designed to withstand 100,000 cycles without failure and provide a cracking pressure of 0.5 psi g.

9. The valve disc shall be concave to the flow direction providing for disc stabilization, maximum strength, and a minimum flow velocity to open the valve.

10. The valve disc and seat shall have a seating surface finish of 16 micro-inch or better to ensure positive seating at all pressures. The leakage rate shall not exceed the allowable rate for metal seated valves allowed by AWWA Standard C508 or 1 oz (30 ml) per hour per inch (mm) of valve diameter.

11. The valve flow way shall be contoured and unrestricted to provide full flow areas at all locations within the valve. Cv flow coefficients shall be equal to or greater than specified below and verified by an independent testing laboratory.

VALVE SIZE (inches (mm))	Wafer Style Cv
2 (50)	43
2.5 (65)	88
3 (80)	130
4 (100)	228
5 (125)	350
6 (150)	520

12. The valves shall be hydrostatically tested at 1.5 times their rated cold working pressure and seat tested at the valve CWP.

N. Pressure Gauges.

1. Gauges shall be provided for the suction and discharge manifold.

2. Accuracy shall be ±1.5%

3. Bourdon tube and connection shall be constructed of 316SS.

4. Case, bezel and internals shall be constructed of 316SS.

5. Gauge shall be filled with glycerin in order to dampen pulsation and vibration and to provide lubrication to the internal parts.

6. Gauge range shall be selected to cover the largest operating range for the specific conditions and pump selected.

O. Flange Bolts. Bolts shall be zinc plated and shall meet ASTM Grade A193 B7.

P. Paint. The finish coat shall be acrylic enamel to a thickness of no less than 3 mils.

Part 3 EXECUTION

3.1 INSTALLATION

A. Install equipment in accordance with manufacturer's instructions.

B. The contractor shall align the pump and motor shafts to within the manufacturer's recommended tolerances prior to system start-up.

C. Power wiring, as required, shall be the responsibility of the electrical contractor. All wiring shall be performed per manufacturer's instructions and applicable state, federal and local codes.

D. Control wiring for remote mounted switches and sensor / transmitters shall be the responsibility of the controls contractor. All wiring shall be performed per manufacturer's instructions and applicable state, federal and local codes.

3.2 DEMONSTRATION

A. The system manufacturer or factory trained representative shall provide start-up of the packaged pumping system. This start-up shall include verification of proper installation, system initiation, adjustment and fine tuning. Start-up shall not be considered complete until the sequence of operation, including all alarms, has been sufficiently demonstrated to the owner or owner's designated representative. This job site visit shall occur only after all hook-ups, tie-ins, and terminations have been completed and signed-off on the manufacturer's start-up request form.

B. The system manufacturer or factory trained representative shall provide on-site training for owner's personnel. This training shall fully cover maintenance and operation of all system components.

C. The system manufacturer must have a complete pressure booster training program available for owner's personnel. The training sessions shall take place at the manufacturer's facility and cover all aspects of pressure booster system design, service and operation.

3.3 WARRANTY

A. The manufacturer shall warrant the water pumping system to be free of defects in material and workmanship for one year (12 months) from date of authorized start-up, not to exceed eighteen (18) months from date of manufacturer's invoice. Complete terms and conditions will be provided upon request.



a xylem brand



3.4 START-UP SERVICE

A. When discharge piping, electrical connections, and electrical inspection have been completed, the pump station representative shall be contacted for start up. A minimum two-week notice shall be given to manufacturer representative prior to scheduled start up date. During start up, the complete pumping system shall be given a running test of normal start and stop, and fully loaded operating conditions. During this test, each pump shall demonstrate its ability to operate without undue vibration, or overheating, and shall demonstrate its general fitness for service. All defects shall be corrected and adjustments shall be made to the pumping station for satisfactory operation. System problems or concerns will be corrected by the general contractor or site station staff, in conjunction with the appropriate factory representative. Testing shall be repeated until satisfactory results are obtained, as determined by the engineer. Start up assistance will be provided by the factory representative and will be limited to one 8-hour day, unless previously negotiated by the factory representative.



Unit Dimensions

Booster Package

MODEL: AquaForce

Hydraulic Data					Motor Data	e-SV Pump	Qty.
Maximum Flow	Flow at Duty Point	Maximum TDH	TDH at Duty Point	NPSHR	Voltage/Phase/HP/Enclosure		
448.9 gpm	1,200.0 gpm	383.3 ft	211.5 ft	12.3 ft	230/460V 3 PH 40.0 hpDPPE	V3VJF6P31E2K	3

Submittal Prepared for: GICON PUMPS & EQUIPMENT

Engineer:

Submittal Prepared by: Debbie Gardner

Submittal Date: June 5, 2012

Job:

Contractor:

Company:

Approved by:

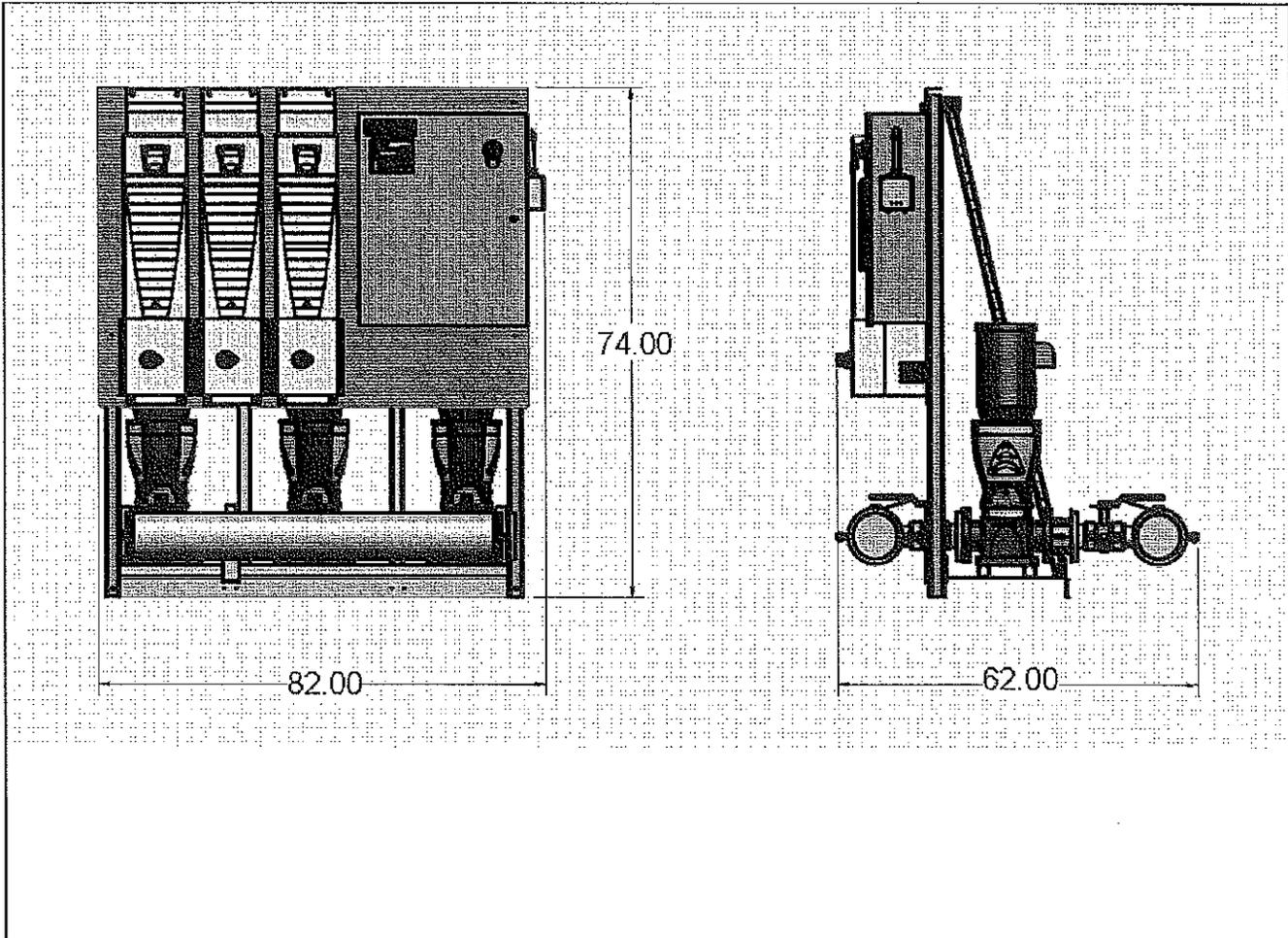
Proposal No: DG12-06-05 01

Item No: ITEM 001

Date: June 5, 2012

- For a more detailed mechanical drawing

[Click here](#)



- Dimensions are subject to change. Not to be used for construction purposes unless certified
- All dimensions shown are in inches unless otherwise stated



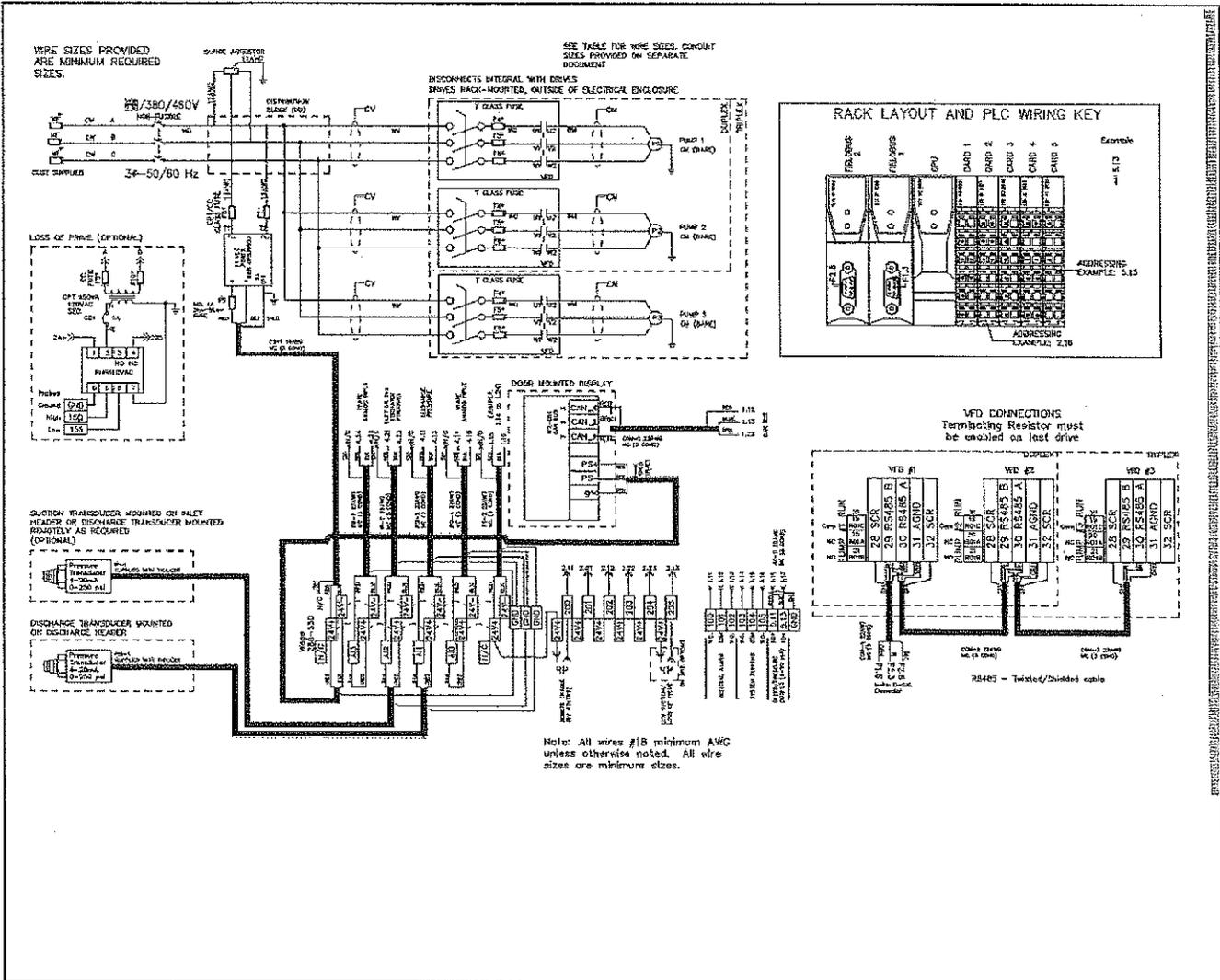
Panel Wiring Diagram

Submittal Prepared for: GICON PUMPS & EQUIPMENT
 Engineer:
 Submittal Prepared by: Debbie Gardner
 Submittal Date: June 5, 2012

Job:
 Contractor:
 Company:
 Approved by:

Proposal No: DG12-06-05 01
 Item No: ITEM 001
 Date: June 5, 2012

• For a more detailed panel wiring diagram [Click here](#)



- Panel schematic chosen less options for submittal purposes
- For construction drawing a purchase order must be received



Performance Data

Booster package

MODEL: e-SV

Hydraulic Data					Motor Data	e-SV Pump	Qty.
Maximum Flow	Flow at Duty Point	Maximum TDH	TDH at Duty Point	NPSHR	Voltage/Phase/Enclosure		
448.9 gpm	1,200.0 gpm	383.3 ft	211.5 ft	12.3 ft	230/460V 3 PH DPPE	V3VJF6P31E2K	3

Submittal Prepared for: GICON PUMPS & EQUIPMENT

Job:

Proposal No: DG12-06-05 01

Engineer:

Contractor:

Item No: ITEM 001

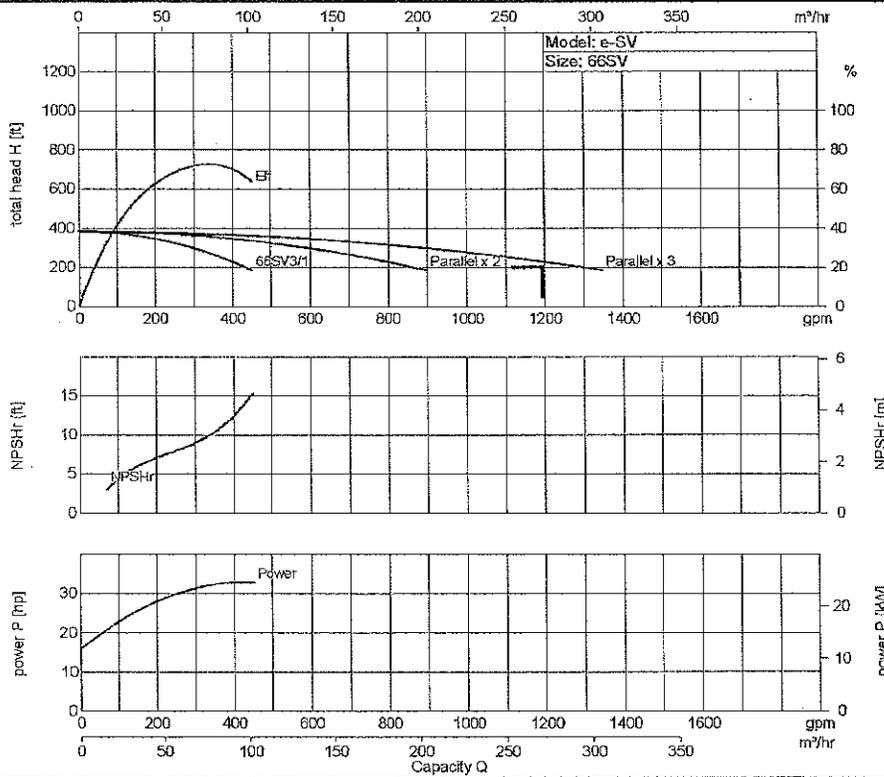
Submittal Prepared by: Debbie Gardner

Company:

Date: June 5, 2012

Submittal Date: June 5, 2012

Approved by:





Performance Data

Booster Package

MODEL: e-SV

Hydraulic Data					Motor Data	e-SV Pump	Qty.
Maximum Flow	Flow at Duty Point	Maximum TDH	TDH at Duty Point	NPSHR	Voltage/Phase/Enclosure		
448.9 gpm	1,200.0 gpm	383.3 ft	211.5 ft	12.3 ft	230/460V 3 PH DPPE	V3VJF6P31E2K	3

Submittal Prepared for: GICON PUMPS & EQUIPMENT

Job:

Proposal No: DG12-06-05 01

Engineer:

Contractor:

Item No: ITEM 001

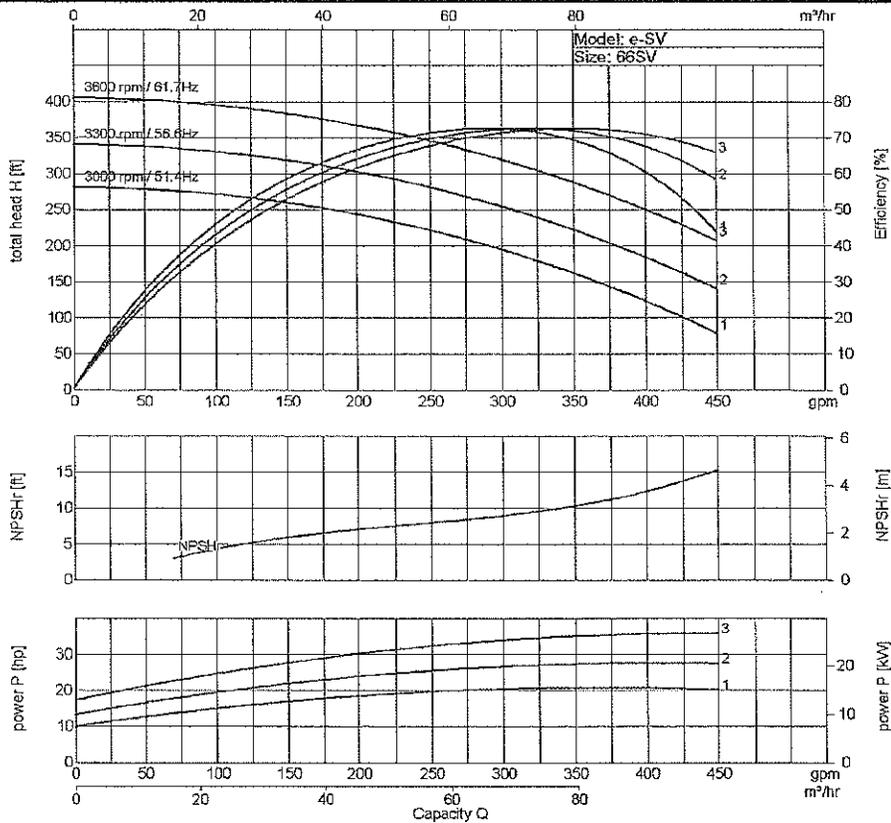
Submittal Prepared by: Debbie Gardner

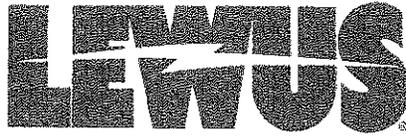
Company:

Date: June 5, 2012

Submittal Date: June 5, 2012

Approved by:





Products

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www.lewuselectric.com

Bus: (928) 468-6320
Fax: 928) 468-6321
Toll Free: 1 (866) 865-8916

1303 Red Baron Rd.
Payson, AZ 85541

May 14, 2012

Randy Sullivan
City of Holbrook
465 First Avenue
P.O. Box 970
Holbrook, AZ 86025

Dear Mr. Sullivan,

Please find enclosed quotations to replace two of your water pumping systems. We appreciate the opportunity to update your old water systems with new energy efficient water systems. Should you have any questions please don't hesitate to call me.

Sincerely,

A handwritten signature in black ink, appearing to read "James E. Lewus". The signature is fluid and cursive, with a large loop at the end.

James E. Lewus
Lewus Electric Co., Inc.

Jel/ml

LEWIS Electric Company, Inc.

1303 Red Baron Rd.
Payson, AZ 85541

Phone: 928-468-6320
Fax: 928-468-6321

5/14/2012

TO: City of Holbrook
465 First Avenue
P.O. Box 970
Holbrook, AZ 86025

Randy Sullivan
Phone: 928-524-6225
Fax: 928-524-2159

FROM: Jim Lewus

Job: Aurora Replacement

TERMS: Net 30 Days
FREIGHT: F.O.B. Factory

QUOTATION

QTY	DESCRIPTION	UNIT PRICE	TOTAL
1	AquaForce Station e-SV Pump, 40HP 3500 RPM DPPE 3STG 92SV32GP4C50 Station Model Number: V2VKF6P32F2K Communication Protocol: None Controls Module: Panel, Mid-Tier, Duplex, VS,460-3P, 40 HP-650-000-033 Mechanical Module: AMERICAS BSTR,66SV,92SV, LG,2BR,VS-600-003-163 Options: SUCTION PRESSURE TRANSDUCER,0-300 PSI Header Size: 8.0 Basic Criteria: Number of Pumps: 2 System Flow: 1,000.0 gpm Flow Split 50% P-1 50% P-2(3/4) Station Discharge Pressure: 87.0 psi.g Suction Type/Pressure: Flooded 3.0FT Station Losses: 5.0 psi.g Input Power: 460V/3ph Cycles: 60 Hz/3,500rpm 105.0 full Load Amps Lead Time: RTF	\$55,797.00	\$55,797.00
	Start up fee includes: Technician 2 hours System start-up for 1 AquaForce unit 1 hour System training Tech. travel and mileage		\$700.00
This quote is based on us supplying the AquaForce Booster Stations and start up only. All plumbing and electrical preparation needs to be done by others. Thank you for the opportunity to quote you on your project.			



GICON PUMPS & EQUIPMENT

May 11, 2012

Proposal No: DG12-05-11 01

Item No: ITEM 001

Job:

Series: e-SV Size: 92SV QTY: 1 Stage No: 3 Reduced Stages: 2

Operating conditions

SERVICE

LIQUID

CAPACITY 1,000.0 gpm

HEAD 209.5 (ft)

Performance at 3500 RPM

PUBLISHED EFFY 76.7% (CDS)

RATED EFFY 76.7%

RATED POWER 34.50 hp (Run out 37.1 hp)

NPSHR 21.0 ft

STATION DISCHARGE PRESSURE 87.0 psi g (0.0 psi g @ Shut off) Based on 1.3 psi g Suc.press

PERF. CURVE 92SV-3600-0

SHUT OFF HEAD 410.7 ft

Quoted Features

CONSTRUCTION CI-304

MECHANICAL SEAL Carbon/Silicon Carbide/Viton

Driver : Electric motor Manufacturer : Factory Choice

FURNISHED BY	Pump Mfg	MOUNTED BY	Pump Mfg
RATING	40.0 hp (29.8 KW)	ENCLOSURE	DPPE
PHASE/FREQ/VOLTS	3/60 Hz/230/460	SPEED	3600 RPM
INSULATION/SF		FRAME	280TC
MOTOR PART NO	V17A32F4BL2S		

Program Version 1.38.0.0



Submittal Data

Multi-Stage Pumps

MODEL : V2VKF6P32F2K

Hydraulic Data					Motor Data	e-SV Vertical Model	Qty.
Maximum Flow	Flow at Duty Point	Maximum TDH	TDH at Duty Point	NPSHR	Voltage/Phase/Enclosure		
699.7 gpm	1,000.0 gpm	410.7 ft	209.5 ft	21.0 ft	230/460V 3 PH DPPE	V2VKF6P32F2K	1

Submittal Prepared for: GICON PUMPS & EQUIPMENT

Job:

Proposal No: DG12-05-11 01

Engineer:

Contractor:

Item No: ITEM 001

Submittal Prepared by: Debbie Gardner

Company:

Date: May 11, 2012

Submittal Date: May 11, 2012

Approved by:

Engineering Data

Pump Code: V2VKF6P32F2K
 Pump Size: 92SV
 Stage No: 3
 Reduced Stages: 2
 Pump Horsepower at Rating Point: 34.50 hp
 Pump Shut Off Head: 410.7 ft
 Efficiency: 76.7 %
 Motor Speed: 3600
 System Input Power: 3 / 230/460 V
 Motor Rated Horsepower: 40.0 hp
 Max.Frequency: 60Hz
 Frame Size: 280TC
 Motor Part No: V17A32F4BL2S
 Discharge Size: 4.00 in
 Impeller Construction: CI-304
 Impeller Type: Radial Impeller
 Shaft Seal: Carbon/Silicon Carbide/Viton

Standard Equipment / Capability:

PUMP

The e-SV pump is a non-self priming vertical multistage pump coupled to a standard motor. The liquid end, located between the upper cover and the pump casing, is held in place by tie rods. The pump casing is available with different configurations and connection types.

- Delivery: up to 700.0 gpm/ Head: up to 1200. ft
- Temperature of pumped liquid: -20.0 deg F to 250.0 deg F standard version
- Direction of rotation: clockwise looking at the pump from the top down (marked with an arrow on the adapter and on the coupling).

MOTOR

- Standard NEMA 280TC Frame motor in open drip proof
- 3600 RPM nominal
- Three phase version, 2 pole: 230/460 V, 60Hz, 40.0 hp
- Vertical multistage centrifugal pump. All metal parts in contact with the pumped liquid are made of stainless steel.
- G-Cast Iron/304SS AISI Round Flange with 580.0 psi g MAWP
- Reduced axial thrusts enable the use of standard NEMA TC motors that are easily found in the market
- Seal housing chamber designed to prevent the accumulation of air in the critical area next to the mechanical seal
- Mechanical seal according to EN 12756 (ex DIN 24960) and ISO 3069
- Versions with ANSI flanges that can be coupled to ANSI counter-flanges
- Threaded oval counter-flanges made of stainless steel are standard supply for the T versions
- Easy maintenance. No special tools required for assembly or disassembly
- Standard version for temperatures ranging from: 0 deg F to 250 deg F (optional to 300 deg F)



PART 1 - GENERAL

1.1 SECTION INCLUDES:

- A. Variable Speed Pumping Package
- B. Pump Control Panel
- C. Variable Frequency Drive
- D. Sensor Transmitters
- E. Sequence of Operation

1.2 REFERENCES

- A. AWWA - American Water Works Association
- B. ANSI - American National Standards Institute
- C. ASTM - American Standards for Testing Materials
- D. HI - Hydraulic Institute
- E. ASME - American Society of Mechanical Engineers
- F. UL - Underwriters Laboratories
- G. ISO - International Standards Organization
- H. NEMA - National Electrical Manufacturers Association
- I. ETL - Electrical Testing Laboratories
- J. CSA - Canadian Standards Association
- K. NEC - National Electrical Code
- L. IEC - International Electrotechnical Commission
- M. NSF - NSF International

1.3 SUBMITTALS

- A. Submittals shall include the following:

- 1. System summary sheet
 - 2. Sequence of operation
 - 3. Shop drawing indicating dimensions, required clearances and location and size of each field connection
 - 4. Power and control wiring diagrams
 - 5. System profile analysis including variable speed pump curves and system curve. The analysis shall also include pump, motor, job specific load profile, staging points and VFD efficiencies horsepower and kilowatt/hour consumption.
 - 6. Pump data sheets
- B. Submittals must be specific to this project. Generic submittals will not be accepted.

1.4 QUALITY ASSURANCE

- A. The pumping package shall be assembled by the pump manufacturer. An assembler of pumping systems not actively engaged in the design and construction of centrifugal pumps shall not be considered a pump manufacturer. The manufacturer shall assume "Unit Responsibility" for the complete pumping package. Unit responsibility shall be defined as responsibility for interface and successful operation of all system components supplied by the pumping system manufacturer.
- B. The manufacturer shall have a minimum of 30 years experience in the design and construction of packaged pumping systems, and over 50 years in active design/ production of centrifugal pumps.
- C. All functions of the variable speed pump control system shall be tested at the factory prior to shipment.
- D. Bidders shall comply with all sections of this specification relating to packaged pumping systems. Any deviations from this specification shall be bid as a voluntary alternate clearly defined in writing. If no exceptions are noted, the supplier or contractor shall be bound by these specifications.
- E. A copy of manufacturer's certificate of insurance showing as a minimum, general liability coverage of \$1,000,000, and an excess liability coverage of \$10,000,000.
- F. The pumping package shall be certified by an approved independent testing and certification organization as being compliant with the requirements of NSF/ANSI 61 for potable drinking water and NSF-61 Annex G for low lead content.
- G. Manufacturer shall be listed by UL as a manufacturer of packaged pumping systems under UL/cUL category QCZJ.
- H. Manufacturer shall be listed by UL as a manufacturer of control panels under UL 508A.
- I. The manufacturer's production facility shall be certified by an approved independent testing and certification organization as being compliant with the requirements of NSF/ANSI 61 and NSF-61 Annex G. The manufacturing facility shall be subjected to periodic inspections and audits.

Part 2 PRODUCTS

2.1 Acceptable Manufacturers

- A. Subject to compliance with these specifications, the following manufacturers shall be acceptable:
 - 1. ITT Goulds
 - 2. Pre-approved equal



2.2 Manufactured Units

- A. Furnish and install as shown on the plans a Variable Speed System model number V2VKF6P32F2K as manufactured by ITT Goulds or approved equal. System shall be capable of delivering 1,000.0 gpm at 87.0 psi g with a 3.0 ft minimum suction pressure. Suction and discharge headers shall be 8.0 in and constructed of 304 series stainless steel.
- B. Manufacturer shall be listed by Underwriters Laboratories as a manufacturer of packaged pumping systems.
- C. The entire pumping package shall be NSF/ANSI/NSF-61 certified for potable drinking water and NSF-61 Annex G for a wetted area, weighted average lead content = 0.25%.
- D. The control system shall include, as a minimum, the programmable logic station controller, variable frequency drives, a manifold mounted 4-20mA pressure transducer and any additional equipment as specified or as required to properly execute the sequence of operation.
- E. System shall require only suction, discharge and drain connections and single point power connections with service entrance disconnect functionality.
- F. All components shall be mounted and shipped as a single unit.
- G. Pumps shall be manufactured by ITT.
- H. The discharge of each pump shall be fitted with a control valve appropriate for station operation. Each pump and discharge valve assembly shall also be equipped with isolation valves so that the pump can be serviced while system is still filled.
- I. Pressure gauges shall be installed on the suction and discharge headers.
- J. Piping shall be sized so that water velocity shall not exceed 10.0 ft/sec in either the branches or manifolds.
- K. Pumps shall be protected from thermal accumulation via individual thermal relief mechanisms.

2.3 Components

A. AquaForce Variable Speed Pump Logic Controller

- 1. The AquaForce VS pump logic controller assembly shall be listed by and bear the label of Underwriter's Laboratory, Inc. (UL/cUL). The controller shall be specifically designed for packaged pressure booster applications.
- 2. The pump logic controller shall be microcomputer based and hold its software in non-volatile memory. On-line field modified data entries, such as stage point, alternation, serial communication, and sensor setup, as a minimum, shall be stored in flash memory with capability to prevent accidental loss of data due to voltage surge or spike. In the event of a complete power outage, all factory preset or last saved data values remain stored and available for recall by the operator.
- 3. The variable speed pump controller shall function to a proven program that safeguards the pumps/system against damaging hydraulic conditions including:
 - a. Motor Overload
 - b. Pump Flow Surges
 - c. Hunting
 - d. Integral Curve Limiting Feature: The pump logic controller shall automatically protect the system from overload through frequency/current optimization.
- 4. The pump logic controller shall be capable of accepting individual analog inputs from zone sensor/transmitters as indicated on the plans. Analog input resolution shall be 12-bit minimum, and the controller shall scan each analog input a minimum of once every 100 milliseconds. Use of a multiplexer for multiple sensor inputs is not acceptable. All sensor/transmitter inputs shall be individually wired to the pump logic controller for continuous scan and comparison function. All analog inputs shall be provided with current limit circuitry to provide short circuit protection and safeguard against incorrect wiring of sensors.
- 5. Hydraulic stabilization program shall utilize a proportional-integral-derivative control function. The proportional, integral and derivative values shall be user-adjustable over an infinite range. The scan and compare rate that selects the command set point and process variable signal shall be continuous and automatically set for optimum performance. Each sensor shall be scanned at least once every 100 milliseconds.
- 6. The pump logic controller shall be self-prompting. All messages shall be displayed in plain English. The following features shall be provided: Multi-fault memory and recall On-screen help functions LED pilot lights and switches Soft-touch membrane keypad switches
- 7. The variable speed pumping controller shall be provided with a user friendly operator interface complete with membrane switches and numeric keypad. Display shall be no less than four lines with each line capable of displaying up to twenty characters. The human interface panel shall display the following values:
 - a. Pump On/Off Status
 - b. Pump % Speed
 - c. Individual Alarm Conditions
 - d. Troubleshooting Diagnostics
 - e. User-adjustable parameters such as alternation, PID, set points, etc.
- 8. The system shall utilize the QuickStart feature to simplify programming and startup of the pump control system. The feature shall be specific to pump systems and use suitable pump terminology.
- 9. A data-logging feature shall be provided as a function of the pump logic controller. The Alarm log shall include the last 40 alarms with date/time stamp. The Pump data log shall display individual pump run timers and pump cycle counters. A Signal log shall be provided to display the maximum and minimum values with date/time stamps for each process variable.
- 10. The Logic controller shall incorporate a Flash Memory for saving and reloading customized settings. These field determined values shall be permanently retained in Flash memory for automatic reloading of the site specific setup values in the event of data corruption due to external disturbances. The Controller shall also employ a sensor setup copy feature.
- 11. The pump controller shall be capable of communicating with the Building Automation System (BAS) by both hard-wired and serial communications. The following communication features shall be provided to the BAS in hardwired form via 4-20ma analog output signals and digital input/outputs:
 - a. Remote system start/stop (dry contact supplied by BAS)
 - b. General Alarm (qty. 1, relay output from pump controller)
 - c. Process variable or VFD speed (qty. 1 4-20ma analog output supplied by pump controller)
 - d. System on/off status (qty. 1 relay output supplied by pump controller)
- 12. The following communication features shall be provided to the Building Automation System via an onboard RS-485 port utilizing None protocol:
 - a. All sensor process variables
 - b. Individual zone set points



Let's Solve Water

- c. Individual pump failure
- d. Individual pump on/off status
- e. Individual VFD on/off status
- f. VFD speed
- g. Individual VFD Failure
- h. Individual sensor failure

13. The pump logic controller shall be an ITT AquaForce VS pump controller. Enclosure shall be NEMA 1 with NEMA 4 rated operator interface.

Variable Frequency Drive

1. The Drive shall be rated to operate from 3-phase power at 208VAC to 600VAC, +10% /-15%, 48Hz to 63Hz. The drive shall employ a full wave rectifier to prevent input line notching and operate at a fundamental (displacement) input power factor of 0.98 at all speeds and nominal load. The drive efficiency shall be 98% or better at full speed and load. An internally mounted AC line reactor or DC choke shall be provided to reduce input current harmonic content, provide protection from power line transients such as utility power factor correction capacitor switching transients and reduce RFI emissions. When a DC choke is utilized it shall be of swinging choke design to mitigate harmonics substantially more than conventional choke designs and shall provide equivalent to 5% impedance. Unit shall be the ABB ACS 550 Series manufactured by ABB Drives & Power Products.

2. The VFD, including all factory-installed options, shall have UL and cUL approval.

3. Enclosure shall be NEMA 1 ventilated for installation as a wall mounted or freestanding unit, depending on the amp rating. Drive shall be equipped with an integrated fusible disconnect switch, pad lockable in the open position for safety during maintenance, and fuses to protect against ground faults.

4. VFD shall utilize a full wave rectifier to convert three phase AC to a fixed DC voltage. Power factor shall remain above 0.98 regardless of speed or load. VFD's employing power factor correction capacitors shall not be acceptable.

5. An internal line reactor (5% impedance) shall be provided to lower harmonic distortion of the power line and to increase the fundamental power factor.

6. The VFD shall be suitable for elevations to 3300. ft above sea level without derating. Maximum operating ambient temperature rating shall not be less than 104 deg F. VFD shall be suitable for operation in environments up to 95% non-condensing humidity.

7. The VFD shall be capable of displaying the following information in plain English via an alphanumeric display:

- a. Output Frequency
- b. Output Voltage
- c. Motor Current
- d. Kilowatts per hour
- e. Fault identification with text
- f. Percent torque
- g. Percent power
- h. RPM

8. The VFD shall have the ability to automatically restart after an over-current, overvoltage, under-voltage, or loss of input signal protective trip. The number of restart attempts, trial time, and time between reset attempts shall be programmable.

9. Three (3) programmable critical frequency lockout ranges to prevent the VFD from operating the load continuously at an unstable speed.

10. Operator Control Panel (Keypad)

a. Each VFD shall be equipped with a front mounted operator control panel (keypad) consisting of a backlit, alphanumeric, graphic display and a keypad with keys for Start/Stop, Local/Remote, Up/Down and Help. Two (2) Softkeys will be provided which change functionality depending upon the position within the parameter hierarchy or state of panel.

b. All parameter names, fault messages, warnings and other information shall be displayed in complete English words or Standard English abbreviations to allow the user to understand what is being displayed without the use of a manual or cross-reference table.

c. The Display shall have contrast adjustment provisions to optimize viewing at any angle.

d. The control panel shall provide a real time clock for time stamping events and fault conditions.

e. The control panel shall include a feature for uploading parameter settings to control panel memory and downloading from the control panel to the same Drive or to another Drive.

f. All Drives throughout the entire power range shall have the same customer interface, including digital display, and keypad, regardless of horsepower rating.

g. The keypad shall be able to be installed or removed from the drive while it is powered, capable of remote mounting, and shall have its own non-volatile memory.

11. Protective Functions

a. For each programmed warning and fault protection function, the Drive shall display a message in complete English words or Standard English abbreviations. The three (3) most recent fault messages along with time, current, speed, voltage, frequency and DI Status shall be stored in the Drive's fault history. The last ten (10) fault names shall be stored in Drive memory.

b. The Drive shall include internal MOV's for phase to phase and phase to ground line voltage transient protection.

c. Output short circuit withstand rating and ground fault protection rated for 100,000 AIC shall be provided per UL508C without relying on line fuses. Motor phase loss protection shall be provided.

d. The Drive shall provide electronic motor overload protection qualified per UL508C.

e. Protection shall be provided for AC line or DC bus overvoltage at 130% of maximum rated or under voltage at 65% of min. rated and input phase loss.

f. A power loss ride through feature will allow the Drive to remain fully operational after losing power as long as kinetic energy can be recovered from the rotating mass of the motor and load.

g. Output short circuit withstand rating and ground fault protection rated for 100,000 AIC shall be provided per UL508C without relying on line fuses. Motor phase loss protection shall be provided.

h. The Drive shall provide electronic motor overload protection qualified per UL508C.

i. Protection shall be provided for AC line or DC bus overvoltage at 130% of maximum rated or under-voltage at 65% of min. rated and input phase loss.

j. A power loss ride through feature will allow the Drive to remain fully operational after losing power as long as kinetic energy can be recovered from the rotating mass of the motor and load.



12. Electrical

a. Pump Logic Controller Enclosure. Main station disconnect shall have a through door operator and shall be sized as shown in the technical data sheet. Individual integrated fusible drive disconnects shall have exterior operators, and shall be sized as shown in the technical data sheet. Station disconnect panel shall be housed in a NEMA 1 enclosure with integral latches. The control enclosure shall be constructed of 14-gauge steel and the back plate assembly shall be constructed of 14-gauge steel.

b. Controls and Enclosure. The control panel with controls shall be built in accordance with NEC, and shall comply with UL standards. Pump station manufacturer shall be authorized under UL508A to manufacture its own control panels. All equipment and wiring shall be mounted within the enclosure and each device shall be labeled with proper identification. All adjustments and maintenance shall be accessible from the front of the control enclosure. A complete wiring circuit diagram and legend with terminals, components, and wiring completely identified shall be provided. Main disconnect shall be interlocked with door.

13. Sensor / Transmitters

a. Pressure transducer shall be utilized for providing all pressure signals for the pump control logic. Pressure transducer shall be a solid-state bonded strain gage type with an accuracy of $\pm 0.5\%$ BFSL and constructed of 316 stainless steel. Transducer shall be rated for a pressure of 300 psi and shall provide gauge pressure output, rather than an absolute. Pressure transducer constructed of plastic is not acceptable. Pressure transducer shall be 4-20mA analog type with 10-28 VDC supply range and utilize a packard type connector to prevent moisture intrusion.

14. Flowmeter, when specified and shown in the plans

a. Provide an ITT ST-104 field mounted flow sensor transmitter as indicated on the plans. Unit shall transmit an isolated 4-20 mA dc signal indicative of process variable to the pump logic controller via standard two wire 24 VDC system. Unit shall consist of an insertion probe and separately mounted transmitter. The unit shall be accurate to within 1% of flow rate from 1.0 ft/sec to 30.0 ft/sec and shall withstand a static pressure of 200.0 psi g with negligible change in output.

15. Variable Speed System Sequence of Operation

a. The system shall consist of a Technologic 1500 pump logic controller with multi-pump parallel operation control, duty-standby pump selection, automatic alternation and automatic transfer to the standby pump upon pump/VFD failure.

b. The pumping system shall start upon the closure of customer's contact when the pump logic controller Mode of Operation is in REMOTE.

c. When the pump logic controller mode in LOCAL, the pumping system shall operate automatically.

d. Each sensor/transmitter shall send a 4-20mA signal to the Technologic 1500 pump logic controller, indicative of process variable condition.

e. When the set point is satisfied by the process variable, the pump speed shall remain constant at the optimum energy consumption level.

f. The pump controller shall automatically start the lag pumps as necessary to satisfy system demand.

g. As demand is satisfied, the controller shall automatically stop lag pumps as necessary to conserve energy.

h. In the event of a pump failure or a VFD fault, the pump logic controller automatically initiates a timed sequence of operation to start the redundant pump/VFD set in the variable speed mode.

i. In the event of the failure of a zone sensor/transmitter, its process variable signal shall be removed from the scan/compare program. The redundant zone sensor/transmitters, if available, shall remain in the scan/compare program for control.

j. PUMP or VFD fault shall be continuously scrolled through the display on the operator interface of the pump logic controller until the fault has been corrected and the controller has been manually reset.

k. When the system is satisfied, the pump controller shall shut down the single running lead pump and enter energy saving / no flow shutdown mode.

E. Pumps

F. Station Frame. The pump station frame shall be designed and fabricated to provide structural support for all attached equipment, and provide anchor bolt support. The base shall supply sufficient rigidity to withstand the stresses of reasonable and competent transportation to site, off loading, installation, and operation.

G. All piping shall be constructed from 304 stainless steel, schedule 10 or heavier pipe as required to maintain a 3 to 1 pressure safety factor (including 0.062 in corrosion allowance).

H. Isolation ball valves.

1. Isolation ball valves shall be certified to NSF-61 for use with potable drinking water.

2. Isolation ball valves shall be certified as low lead having wetted surface area with a weighted average lead content $< 0.25\%$.

3. Valves shall be rated for 600.0 psi g WOG / 150.0 psi g WSP for valves 0.25 in to 2.0 in and 400.0 psi g WOG / 125.0 psi g WSP for valves 2.5 in to 4.0 in.

4. Seats and stem packing shall be virgin PTFE. Stem shall be bottom loaded blowout proof design with fluorocarbon elastomer O-ring to prevent stem leaks.

5. Valves shall be 2-piece full port design.

i. Isolation Grooved Butterfly Valves.

1. Valves shall be certified to NSF-61 for use with potable drinking water.

2. Valve bodies shall be investment cast C8FM to ASTM A743 with integral neck and ISO mounting top.

3. Valve handle shall be a 304 stainless steel.

4. The disc shall be a dual-seal type, encapsulated either with Gr. E EPDM for cold and hot water services.

5. Valves shall be rated for 300.0 psi g CWP

J. Isolation lug style butterfly valve.

1. Valve shall be certified to NSF-61 for use with potable drinking water.

2. Valve body shall be made of ASTM 536 ductile iron and will be coated with an FDA approved epoxy. Valve face to face dimensions shall comply with API 609 and MSS-SP-67.

3. Disc shall be made of ASTM A-351 stainless steel. Shaft shall be made of 316SS.

4. Bushing shall be made of a Teflon®-Darcon inner liner bonded to fiberglass-epoxy resin outer shell.

5. Seat shall be EPDM.

6. Valve shall be rated to 200.0 psi g WOG.

K. Threaded check valves.

1. All valve metallic components shall be 316SS.

2. Seat shall be Viton.



3. Valve shall be rated for 400.0 psi g WOG.

L. Wafer check valves.

1. The valve body shall be constructed of ASTM A126 Class B cast iron for Class 125/150 and Class 250/300 valves.
2. The seal and disc shall be ASTM B584 Alloy C83600 cast bronze or ASTM B148 Alloy C95200 aluminum bronze.
3. The compression spring shall be ASTM A313 Type 316 Stainless Steel with ground ends.
4. Valve interiors and exteriors shall be coated with an NSF/ANSI-61 certified fusion bonded epoxy in accordance with AWWA C550.
5. The exterior of the valve shall be coated with a universal alkyd primer.
6. The valve design shall incorporate a center guided, spring loaded disc, guided at opposite ends and having a short linear stroke that generates a flow area equal to the nominal valve size.
7. The operation of the valve shall not be affected by the position of installation. The valve shall be capable of operating in the horizontal or vertical positions with the flow up or down.
8. All component parts shall be field replaceable without the need of special tools. A replaceable guide bushing shall be provided and held in position by the spring. The spring shall be designed to withstand 100,000 cycles without failure and provide a cracking pressure of 0.5 psi g.
9. The valve disc shall be concave to the flow direction providing for disc stabilization, maximum strength, and a minimum flow velocity to open the valve.
10. The valve disc and seat shall have a seating surface finish of 16 micro-inch or better to ensure positive seating at all pressures. The leakage rate shall not exceed the allowable rate for metal seated valves allowed by AWWA Standard C508 or 1 oz (30 ml) per hour per inch (mm) of valve diameter.
11. The valve flow way shall be contoured and unrestricted to provide full flow areas at all locations within the valve. Cv flow coefficients shall be equal to or greater than specified below and verified by an independent testing laboratory.

VALVE SIZE (inches (mm))	Wafer Style Cv
2 (50)	43
2.5 (65)	88
3 (80)	130
4 (100)	228
5 (125)	350
6 (150)	520

12. The valves shall be hydrostatically tested at 1.5 times their rated cold working pressure and seat tested at the valve CWP.

N. Pressure Gauges.

1. Gauges shall be provided for the suction and discharge manifold.
2. Accuracy shall be $\pm 1.5\%$
3. Bourdon tube and connection shall be constructed of 316SS.
4. Case, bezel and internals shall be constructed of 316SS.
5. Gauge shall be filled with glycerin in order to dampen pulsation and vibration and to provide lubrication to the internal parts.
6. Gauge range shall be selected to cover the largest operating range for the specific conditions and pump selected.

O. Flange Bolts. Bolts shall be zinc plated and shall meet ASTM Grade A193 B7.

P. Paint. The finish coat shall be acrylic enamel to a thickness of no less than 3 mils.

Part 3 EXECUTION

3.1 INSTALLATION

- A. Install equipment in accordance with manufacturer's instructions.
- B. The contractor shall align the pump and motor shafts to within the manufacturer's recommended tolerances prior to system start-up.
- C. Power wiring, as required, shall be the responsibility of the electrical contractor. All wiring shall be performed per manufacturer's instructions and applicable state, federal and local codes.
- D. Control wiring for remote mounted switches and sensor / transmitters shall be the responsibility of the controls contractor. All wiring shall be performed per manufacturer's instructions and applicable state, federal and local codes.

3.2 DEMONSTRATION

- A. The system manufacturer or factory trained representative shall provide start-up of the packaged pumping system. This start-up shall include verification of proper installation, system initiation, adjustment and fine tuning. Start-up shall not be considered complete until the sequence of operation, including all alarms, has been sufficiently demonstrated to the owner or owner's designated representative. This job site visit shall occur only after all hook-ups, tie-ins, and terminations have been completed and signed-off on the manufacturer's start-up request form.
- B. The system manufacturer or factory trained representative shall provide on-site training for owner's personnel. This training shall fully cover maintenance and operation of all system components.
- C. The system manufacturer must have a complete pressure booster training program available for owner's personnel. The training sessions shall take place at the manufacturer's facility and cover all aspects of pressure booster system design, service and operation.

3.3 WARRANTY

- A. The manufacturer shall warrant the water pumping system to be free of defects in material and workmanship for one year (12 months) from date of authorized start-up, not to exceed eighteen (18) months from date of manufacturer's invoice. Complete terms and conditions will be provided upon request.



3.4 START-UP SERVICE

A. When discharge piping, electrical connections, and electrical inspection have been completed, the pump station representative shall be contacted for start up. A minimum two-week notice shall be given to manufacturer representative prior to scheduled start up date. During start up, the complete pumping system shall be given a running test of normal start and stop, and fully loaded operating conditions. During this test, each pump shall demonstrate its ability to operate without undue vibration, or overheating, and shall demonstrate its general fitness for service. All defects shall be corrected and adjustments shall be made to the pumping station for satisfactory operation. System problems or concerns will be corrected by the general contractor or site station staff, in conjunction with the appropriate factory representative. Testing shall be repeated until satisfactory results are obtained, as determined by the engineer. Start up assistance will be provided by the factory representative and will be limited to one 8-hour day, unless previously negotiated by the factory representative.



Unit Dimensions

Booster Package

MODEL: AquaForce

Hydraulic Data					Motor Data	e-SV Pump	Qty.
Maximum Flow	Flow at Duty Point	Maximum TDH	TDH at Duty Point	NPSHR	Voltage/Phase/HP/Enclosure		
699.7 gpm	1,000.0 gpm	410.7 ft	209.5 ft	21.0 ft	230/460V 3 PH 40.0 hpDPPE	V2VKF6P32F2K	2

Submittal Prepared for: GICON PUMPS & EQUIPMENT

Engineer:

Submittal Prepared by: Debbie Gardner

Submittal Date: May 11, 2012

Job:

Contractor:

Company:

Approved by:

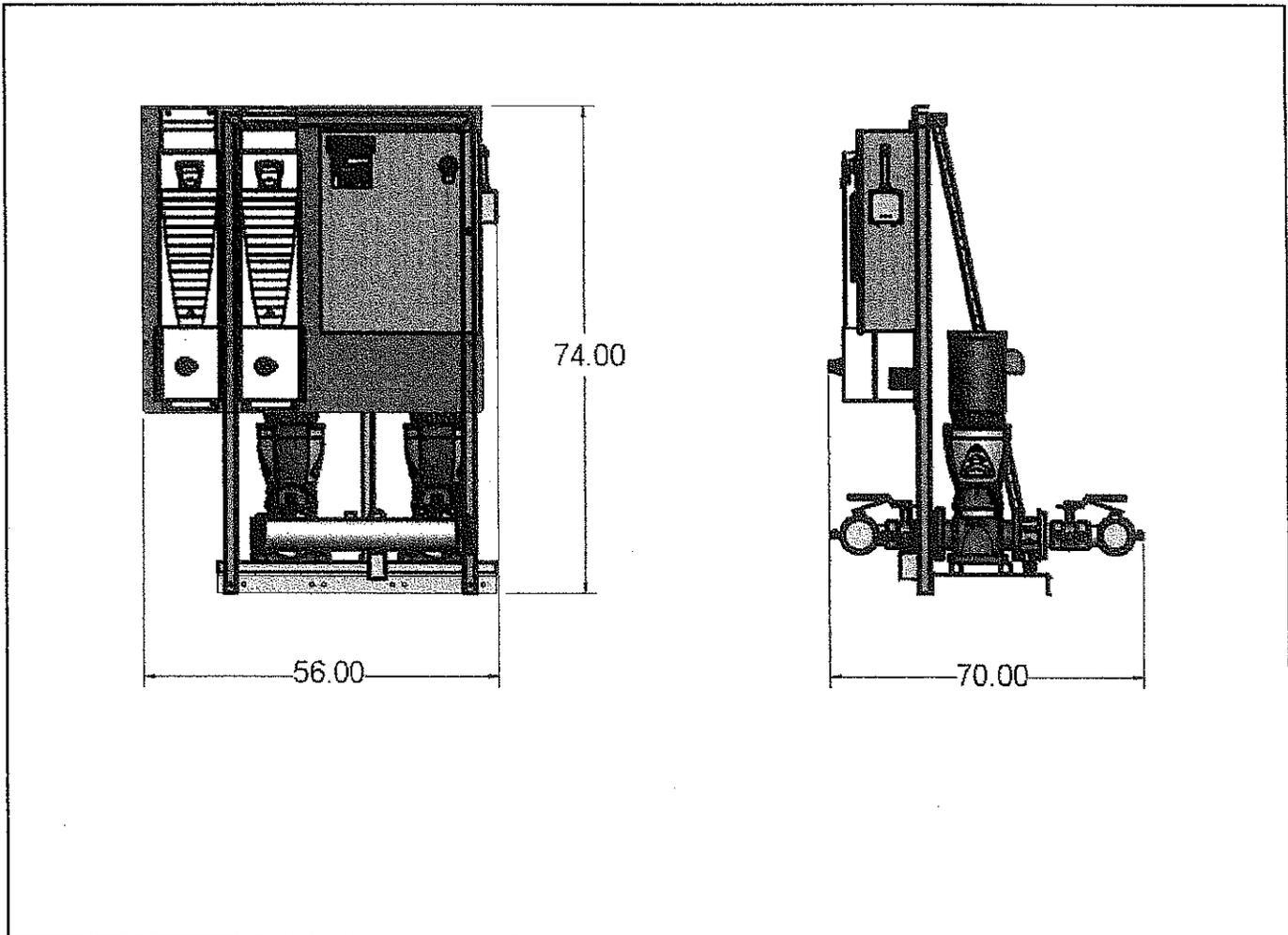
Proposal No: DG12-05-11 01

Item No: ITEM 001

Date: May 11, 2012

• For a more detailed mechanical drawing

[Click here](#)



- Dimensions are subject to change. Not to be used for construction purposes unless certified
- All dimensions shown are in inches unless otherwise stated

Panel Wiring Diagram

Submittal Prepared for: GICON PUMPS & EQUIPMENT

Engineer:

Submittal Prepared by: Debbie Gardner

Submittal Date: May 11, 2012

Job:

Contractor:

Company:

Approved by:

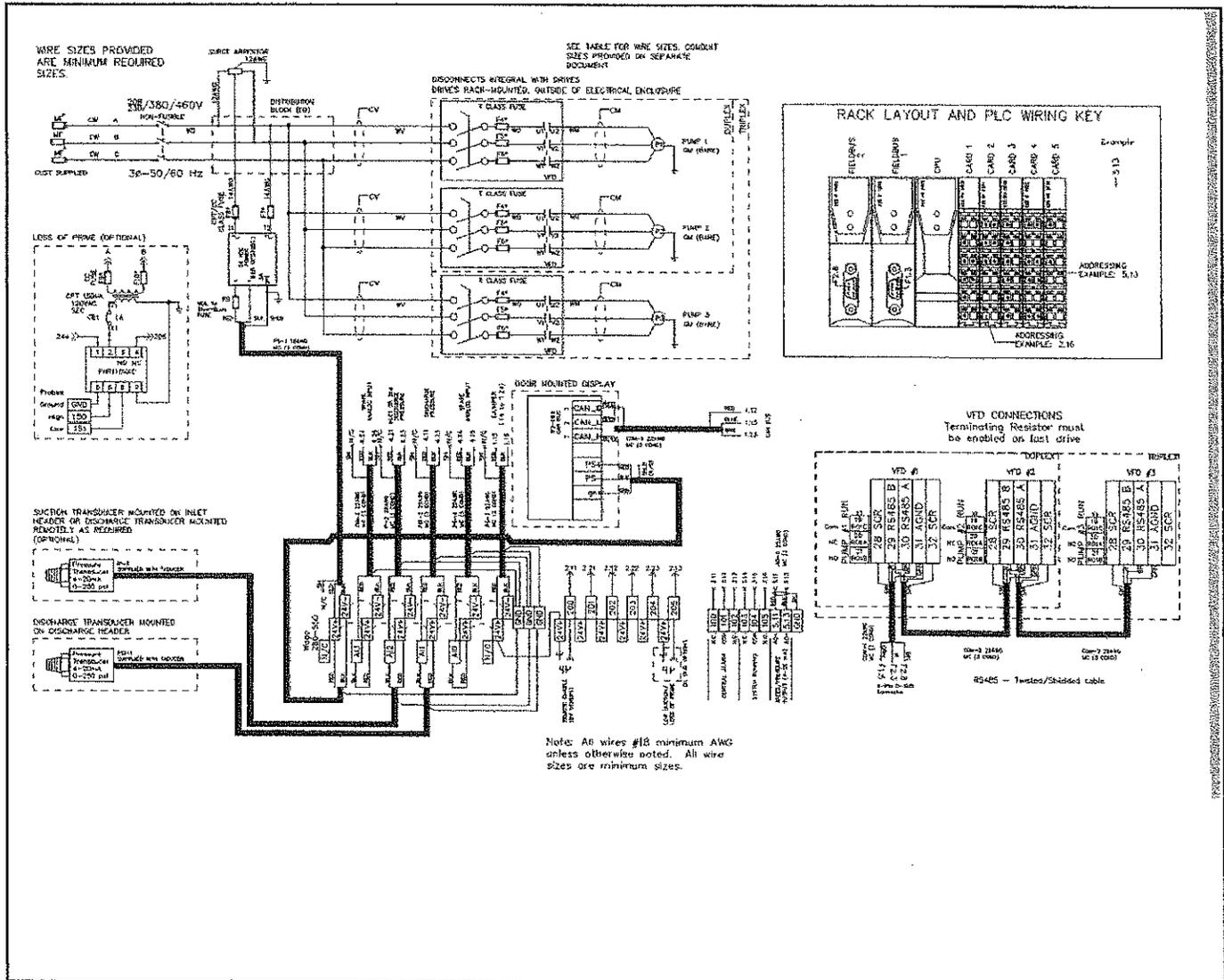
Proposal No: DG12-05-11 01

Item No: ITEM 001

Date: May 11, 2012

• For a more detailed panel wiring diagram

[Click here](#)



- Panel schematic chosen less options for submittal purposes
- For construction drawing a purchase order must be received



Performance Data

Booster package

MODEL: e-SV

Hydraulic Data					Motor Data	e-SV Pump	Qty.
Maximum Flow	Flow at Duty Point	Maximum TDH	TDH at Duty Point	NPSHR	Voltage/Phase/Enclosure		
699.7 gpm	1,000.0 gpm	410.7 ft	209.5 ft	21.0 ft	230/460V 3 PH DPPE	V2VKF6P32F2K	2

Submittal Prepared for: GICON PUMPS & EQUIPMENT

Job:

Proposal No: DG12-05-11 01

Engineer:

Contractor:

Item No: ITEM 001

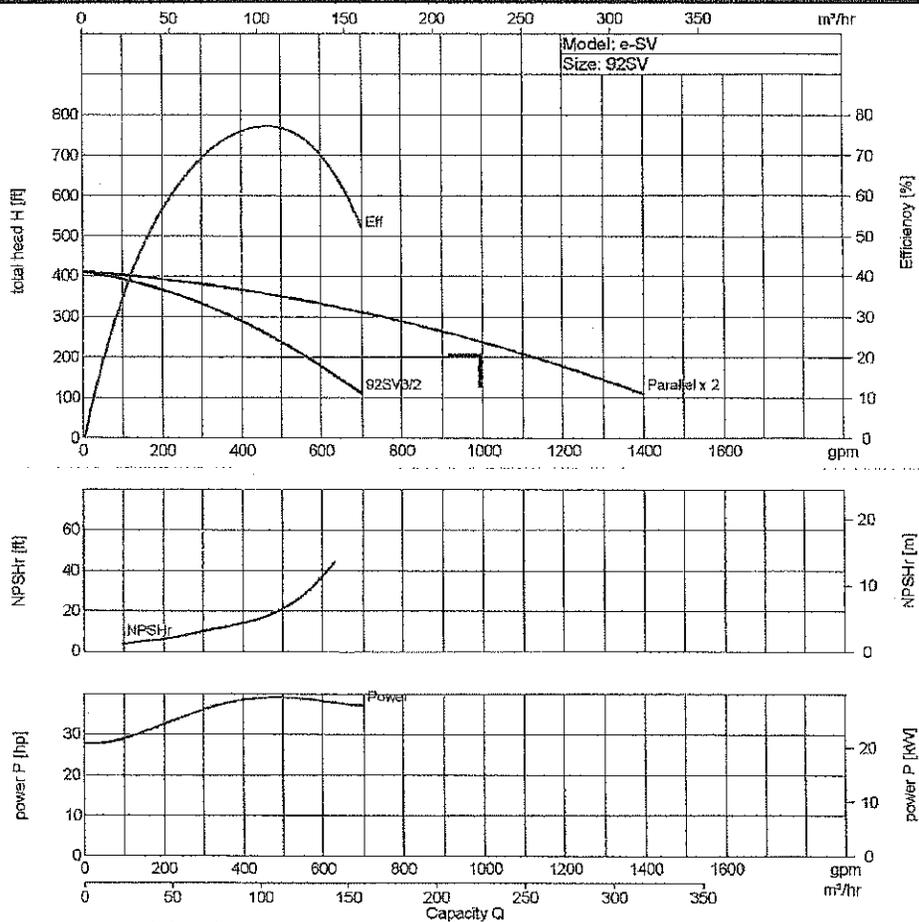
Submittal Prepared by: Debbie Gardner

Company:

Date: May 11, 2012

Submittal Date: May 11, 2012

Approved by:





Performance Data

Booster Package

MODEL: e-SV

Hydraulic Data					Motor Data	e-SV Pump	Qty.
Maximum Flow	Flow at Duty Point	Maximum TDH	TDH at Duty Point	NPSHR	Voltage/Phase/Enclosure		
699.7 gpm	1,000.0 gpm	410.7 ft	209.5 ft	21.0 ft	230/460V 3 PH DPPE	V2VKF6P32F2K	2

Submittal Prepared for: GICON PUMPS & EQUIPMENT

Job:

Proposal No: DG12-05-11 01

Engineer:

Contractor:

Item No: ITEM 001

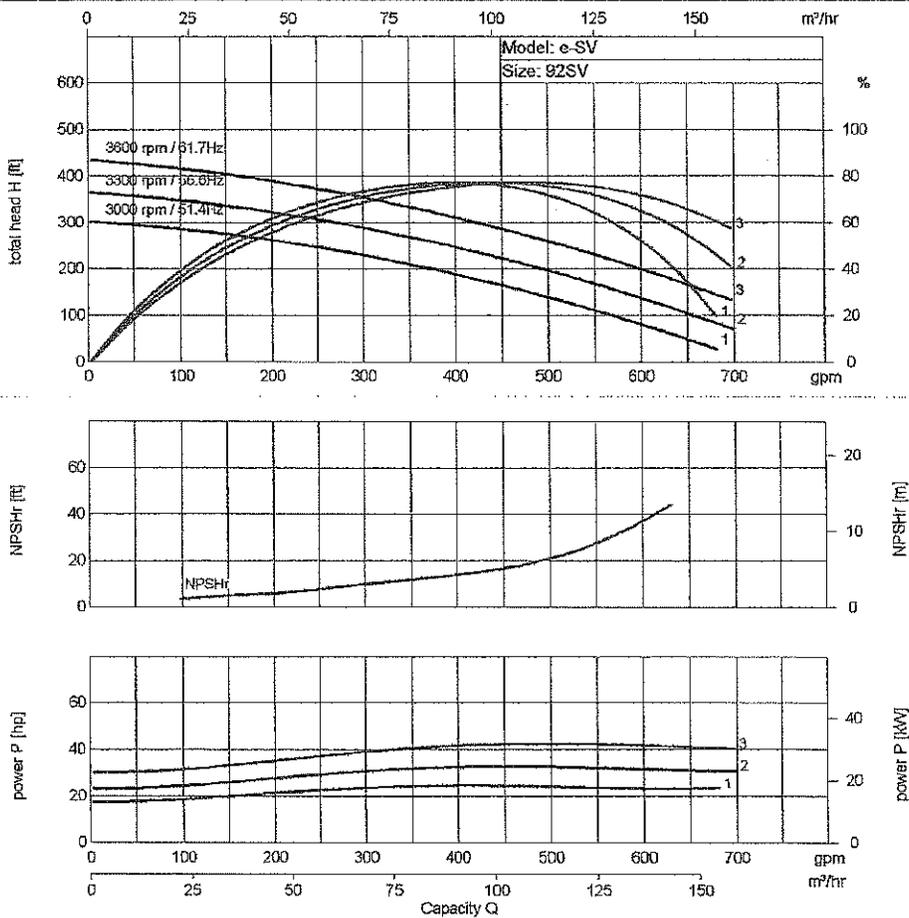
Submittal Prepared by: Debbie Gardner

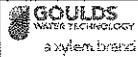
Company:

Date: May 11, 2012

Submittal Date: May 11, 2012

Approved by:





Model	e-SV
Speed	Variable
Liquid	
Nom. Temperature	70.0 deg F
Spec. Gravity	1.000
Viscosity	1.000 cp
Vapor Press	
Solids% / Size	

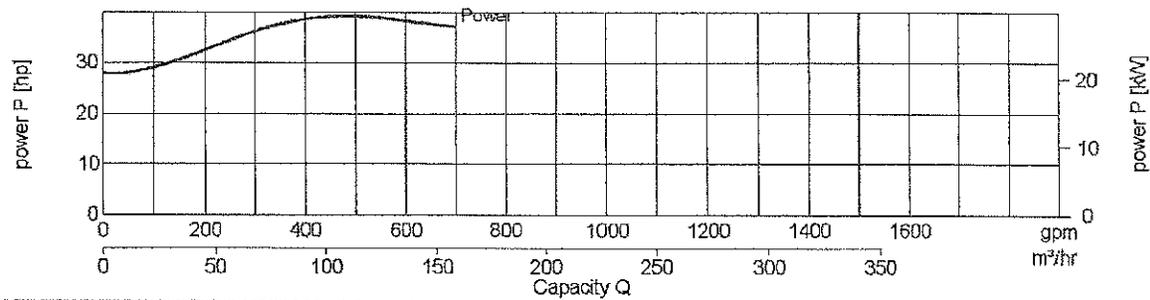
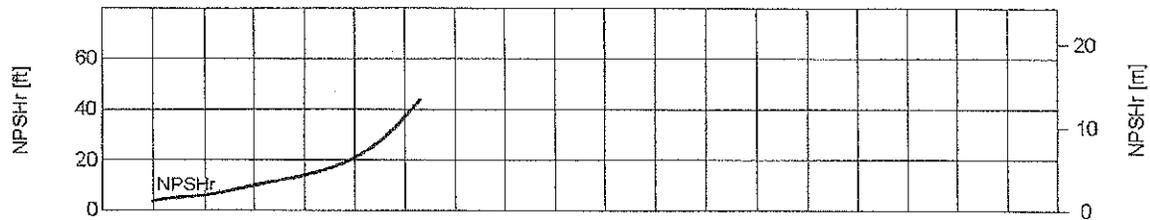
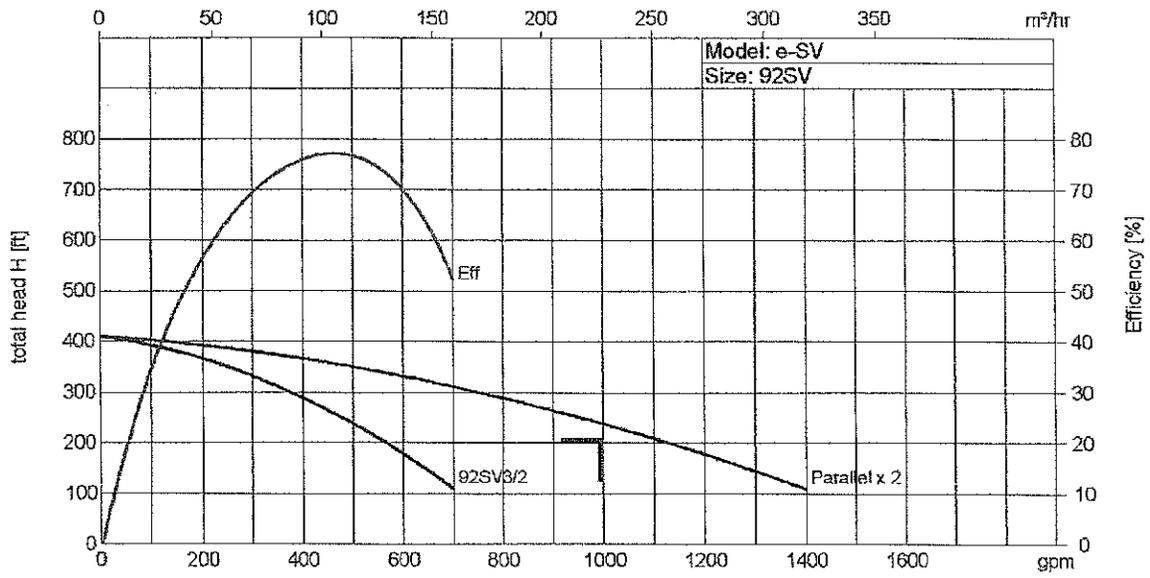
Size	92SV
Frequency	60Hz
Date	05/11/2012
Issued by:	Debbie Gardner
Quotation No.	DG12-05-11 01
Job/Inq.No.	
Order No.	

Purchaser	GICON PUMPS & EQUIPMENT
End User	
Item No.	ITEM 001
Service	
Certified By	

Rated Operating Point

Capacity	1,000.0 gpm	Power - Pump	34.50 hp	No. of Stages	3
Head	209.5 ft	Power - Others		Imp. Diameter:	6.0000 in
NPSHa		Power - Totals	34.50 hp	Imp. Dia. Adl Stg:	
NPSHr	21.0 ft	Power - max.	39.2 hp	Min. Hydraulic Flow	100.0 gpm
Rated Efficiency	153.3 %			Min. Thermal Flow	N/A
Suction Spec. Speed	8,464 gpm(US) ft				

Notes:



LEWUS Electric Company, Inc.

1303 Red Baron Rd.
Payson, AZ 85541

Phone: 928-468-6320
Fax: 928-468-6321

5/14/2012

TO: City of Holbrook
465 First Avenue
P.O. Box 970
Holbrook, AZ 86025

FROM: Jim Lewus

Job: Peerless Replacement

Randy Sullivan
Phone: 928-524-6225
Fax: 928-524-2159

Terms: Net 30 Days
Freight: F.O.B. Factory

QUOTATION

QTY	DESCRIPTION	UNIT PRICE	TOTAL
1	AquaForce Station	\$45,750.00	\$45,750.00
	e-SV Pump, 40HP 3500 RPM DPPE 3STG-66SV32GP4C50		
	Station Model Number: V2VJE6P32E2K		
	Communication Protocol: None		
	Controls Module: Panel, Mid-Tier, Duplex, VS.460-3P, 40 HP-650-000-033		
	Mechanical Module: AMERICAS.BSTR.66SV.92SV.LG.2BR.VS.600-003-162		
	Options: SUCTION PRESSURE TRANSDUCER, 0-300 PSI		
	Header Size: 6.0		
	Basic Criteria		
	Number of Pumps: 2		
	System Flow: 700.0 gpm		
	Flow Split 50% P-1 50% P-2(3/4)		
	Station Discharge Pressure: 87.0 psi g		
	Suction Type/Pressure: Flooded 5.0 ft		
	Station Losses: 5.0 psi g		
	Input Power: 460V/3ph Cycles: 60 Hz/3,500rpm		
	105.0 full Load Amps		
	Lead Time: RTF		
	Start up fee includes;		\$700.00
	Technician		
	2 hours System start-up for 1 Aquaforce Unit		
	1 hour System training		
	Tech. travel and mileage		
This quote is based on us supplying the AquaForce Booster Stations and start up only.			
All plumbing and electrical preparation needs to be done by others.			
Thank you for the opportunity to quote you on your project.			



GICON PUMPS & EQUIPMENT

May 11, 2012

Proposal No: DG12-05-11 01

Item No: ITEM 001

Job:

Series: e-SV Size: 66SV QTY: 1 Stage No: 3 Reduced Stages: 2

Operating conditions

SERVICE

LIQUID

CAPACITY 700.0 gpm

HEAD 207.5 (ft)

Performance at 3500 RPM

PUBLISHED EFFY 74.5% (CDS)

RATED EFFY 74.5%

RATED POWER 24.60 hp (Run out 30.3 hp)

NPSHR 17.0 ft

STATION DISCHARGE PRESSURE 87.0 psi g (0.0 psi g @ Shut off) Based on 2.2 psi g Suc.press

PERF. CURVE 66SV-3600-0

SHUT OFF HEAD 370.8 ft

Quoted Features

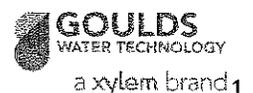
CONSTRUCTION CI-304

MECHANICAL SEAL Carbon/Silicon Carbide/Viton

Driver : Electric motor Manufacturer : Factory Choice

FURNISHED BY	Pump Mfg	MOUNTED BY	Pump Mfg
RATING	40.0 hp (29.8 KW)	ENCLOSURE	DPPE
PHASE/FREQ/VOLTS	3/60 Hz/230/460	SPEED	3600 RPM
INSULATION/SF		FRAME	280TC
MOTOR PART NO	V17A32F4BL2S		

Program Version 1.38.0.0





Submittal Data

Multi-Stage Pumps

MODEL : V2VJE6P32E2K

Hydraulic Data					Motor Data	e-SV Vertical Model	Qty.
Maximum Flow	Flow at Duty Point	Maximum TDH	TDH at Duty Point	NPSHR	Voltage/Phase/Enclosure		
449.4 gpm	700.0 gpm	370.8 ft	207.5 ft	17.0 ft	230/460V 3 PH DPPE	V2VJE6P32E2K	1

Submittal Prepared for: GICON PUMPS & EQUIPMENT

Engineer:

Submittal Prepared by: Debbie Gardner

Submittal Date: May 11, 2012

Job:

Contractor:

Company:

Approved by:

Proposal No: DG12-05-11 01

Item No: ITEM 001

Date: May 11, 2012

Engineering Data

Pump Code: V2VJE6P32E2K

Pump Size: 66SV

Stage No: 3

Reduced Stages: 2

Pump Horsepower at Rating Point: 24.60 hp

Pump Shut Off Head: 370.8 ft

Efficiency: 74.5 %

Motor Speed: 3600

System Input Power: 3 / 230/460 V

Motor Rated Horsepower: 40.0 hp

Max.Frequency: 60Hz

Frame Size: 280TC

Motor Part No: V17A32F4BL2S

Discharge Size: 4.00 in

Impeller Construction: CI-304

Impeller Type: Radial Impeller

Shaft Seal: Carbon/Silicon Carbide/Viton

Standard Equipment / Capability:

PUMP

The e-SV pump is a non-self priming vertical multistage pump coupled to a standard motor. The liquid end, located between the upper cover and the pump casing, is held in place by tie rods. The pump casing is available with different configurations and connection types.

- Delivery: up to 700.0 gpm/ Head: up to 1200. ft
- Temperature of pumped liquid: -20.0 deg F to 250.0 deg F standard version
- Direction of rotation: clockwise looking at the pump from the top down (marked with an arrow on the adapter and on the coupling).

MOTOR

- Standard NEMA 280TC Frame motor in open drip proof
- 3600 RPM nominal
- Three phase version, 2 pole: 230/460 V, 60Hz, 40.0 hp
- Vertical multistage centrifugal pump. All metal parts in contact with the pumped liquid are made of stainless steel.
- G-Cast Iron/304SS AISI Round Flange with 580.0 psi g MAWP
- Reduced axial thrusts enable the use of standard NEMA TC motors that are easily found in the market
- Seal housing chamber designed to prevent the accumulation of air in the critical area next to the mechanical seal
- Mechanical seal according to EN 12756 (ex DIN 24960) and ISO 3069
- Versions with ANSI flanges that can be coupled to ANSI counter-flanges
- Threaded oval counter-flanges made of stainless steel are standard supply for the T versions
- Easy maintenance. No special tools required for assembly or disassembly
- Standard version for temperatures ranging from: 0 deg F to 250 deg F (optional to 300 deg F)



a xylem brand, 1



PART 1 - GENERAL

1.1 SECTION INCLUDES:

- A. Variable Speed Pumping Package
- B. Pump Control Panel
- C. Variable Frequency Drive
- D. Sensor Transmitters
- E. Sequence of Operation

1.2 REFERENCES

- A. AWWA - American Water Works Association
- B. ANSI - American National Standards Institute
- C. ASTM - American Standards for Testing Materials
- D. HI - Hydraulic Institute
- E. ASME - American Society of Mechanical Engineers
- F. UL - Underwriters Laboratories
- G. ISO - International Standards Organization
- H. NEMA - National Electrical Manufacturers Association
- I. ETL - Electrical Testing Laboratories
- J. CSA - Canadian Standards Association
- K. NEC - National Electrical Code
- L. IEC - International Electrotechnical Commission
- M. NSF - NSF International

1.3 SUBMITTALS

A. Submittals shall include the following:

- 1. System summary sheet
 - 2. Sequence of operation
 - 3. Shop drawing indicating dimensions, required clearances and location and size of each field connection
 - 4. Power and control wiring diagrams
 - 5. System profile analysis including variable speed pump curves and system curve. The analysis shall also include pump, motor, job specific load profile, staging points and VFD efficiencies horsepower and kilowatt/hour consumption.
 - 6. Pump data sheets
- B. Submittals must be specific to this project. Generic submittals will not be accepted.

1.4 QUALITY ASSURANCE

- A. The pumping package shall be assembled by the pump manufacturer. An assembler of pumping systems not actively engaged in the design and construction of centrifugal pumps shall not be considered a pump manufacturer. The manufacturer shall assume "Unit Responsibility" for the complete pumping package. Unit responsibility shall be defined as responsibility for interface and successful operation of all system components supplied by the pumping system manufacturer.
- B. The manufacturer shall have a minimum of 30 years experience in the design and construction of packaged pumping systems, and over 50 years in active design/ production of centrifugal pumps.
- C. All functions of the variable speed pump control system shall be tested at the factory prior to shipment.
- D. Bidders shall comply with all sections of this specification relating to packaged pumping systems. Any deviations from this specification shall be bid as a voluntary alternate clearly defined in writing. If no exceptions are noted, the supplier or contractor shall be bound by these specifications.
- E. A copy of manufacturer's certificate of insurance showing as a minimum, general liability coverage of \$1,000,000, and an excess liability coverage of \$10,000,000.
- F. The pumping package shall be certified by an approved independent testing and certification organization as being compliant with the requirements of NSF/ANSI 61 for potable drinking water and NSF-61 Annex G for low lead content.
- G. Manufacturer shall be listed by UL as a manufacturer of packaged pumping systems under UL/cUL category QCZJ.
- H. Manufacturer shall be listed by UL as a manufacturer of control panels under UL 508A.
- I. The manufacturer's production facility shall be certified by an approved independent testing and certification organization as being compliant with the requirements of NSF/ANSI 61 and NSF-61 Annex G. The manufacturing facility shall be subjected to periodic inspections and audits.

Part 2 PRODUCTS

2.1 Acceptable Manufacturers

- A. Subject to compliance with these specifications, the following manufacturers shall be acceptable:
 - 1. ITT Goulds
 - 2. Pre-approved equal



Let's Solve Water

2.2 Manufactured Units

- A. Furnish and install as shown on the plans a Variable Speed System model number V2VJEGP32E2K as manufactured by ITT Goulds or approved equal. System shall be capable of delivering 700.0 gpm at 87.0 psi g with a 5.0 ft minimum suction pressure. Suction and discharge headers shall be 6.0 in and constructed of 304 series stainless steel.
- B. Manufacturer shall be listed by Underwriters Laboratories as a manufacturer of packaged pumping systems.
- C. The entire pumping package shall be NSF/ANSI/NSF-61 certified for potable drinking water and NSF-61 Annex G for a wetted area, weighted average lead content = 0.25%.
- D. The control system shall include, as a minimum, the programmable logic station controller, variable frequency drives, a manifold mounted 4-20mA pressure transducer and any additional equipment as specified or as required to properly execute the sequence of operation.
- E. System shall require only suction, discharge and drain connections and single point power connections with service entrance disconnect functionality.
- F. All components shall be mounted and shipped as a single unit.
- G. Pumps shall be manufactured by ITT.
- H. The discharge of each pump shall be fitted with a control valve appropriate for station operation. Each pump and discharge valve assembly shall also be equipped with isolation valves so that the pump can be serviced while system is still filled.
- I. Pressure gauges shall be installed on the suction and discharge headers.
- J. Piping shall be sized so that water velocity shall not exceed 10.0 ft/sec in either the branches or manifolds.
- K. Pumps shall be protected from thermal accumulation via individual thermal relief mechanisms.

2.3 Components

A. AquaForce Variable Speed Pump Logic Controller

1. The AquaForce VS pump logic controller assembly shall be listed by and bear the label of Underwriter's Laboratory, Inc. (UL/cUL). The controller shall be specifically designed for packaged pressure booster applications.
2. The pump logic controller shall be microcomputer based and hold its software in non-volatile memory. On-line field modified data entries, such as stage point, alternation, serial communication, and sensor setup, as a minimum, shall be stored in flash memory with capability to prevent accidental loss of data due to voltage surge or spike. In the event of a complete power outage, all factory preset or last saved data values remain stored and available for recall by the operator.
3. The variable speed pump controller shall function to a proven program that safeguards the pumps/system against damaging hydraulic conditions including:
 - a. Motor Overload
 - b. Pump Flow Surges
 - c. Hunting
 - d. Integral Curve Limiting Feature: The pump logic controller shall automatically protect the system from overload through frequency/current optimization.
4. The pump logic controller shall be capable of accepting individual analog inputs from zone sensor/transmitters as indicated on the plans. Analog input resolution shall be 12-bit minimum, and the controller shall scan each analog input a minimum of once every 100 milliseconds. Use of a multiplexer for multiple sensor inputs is not acceptable. All sensor/transmitter inputs shall be individually wired to the pump logic controller for continuous scan and comparison function. All analog inputs shall be provided with current limit circuitry to provide short circuit protection and safeguard against incorrect wiring of sensors.
5. Hydraulic stabilization program shall utilize a proportional-integral-derivative control function. The proportional, integral and derivative values shall be user-adjustable over an infinite range. The scan and compare rate that selects the command set point and process variable signal shall be continuous and automatically set for optimum performance. Each sensor shall be scanned at least once every 100 milliseconds.
6. The pump logic controller shall be self-prompting. All messages shall be displayed in plain English. The following features shall be provided: Multi-fault memory and recall On-screen help functions LED pilot lights and switches Soft-touch membrane keypad switches
7. The variable speed pumping controller shall be provided with a user friendly operator interface complete with membrane switches and numeric keypad. Display shall be no less than four lines with each line capable of displaying up to twenty characters. The human interface panel shall display the following values:
 - a. Pump On/Off Status
 - b. Pump % Speed
 - c. Individual Alarm Conditions
 - d. Troubleshooting Diagnostics
 - e. User-adjustable parameters such as alternation, PID, set points, etc.
8. The system shall utilize the QuickStart feature to simplify programming and startup of the pump control system. The feature shall be specific to pump systems and use suitable pump terminology.
9. A data-logging feature shall be provided as a function of the pump logic controller. The Alarm log shall include the last 40 alarms with date/time stamp. The Pump data log shall display individual pump run timers and pump cycle counters. A Signal log shall be provided to display the maximum and minimum values with date/time stamps for each process variable.
10. The Logic controller shall incorporate a Flash Memory for saving and reloading customized settings. These field determined values shall be permanently retained in Flash memory for automatic reloading of the site specific setup values in the event of data corruption due to external disturbances. The Controller shall also employ a sensor setup copy feature.
11. The pump controller shall be capable of communicating with the Building Automation System (BAS) by both hard-wired and serial communications. The following communication features shall be provided to the BAS in hardwired form via 4-20ma analog output signals and digital input/outputs:
 - a. Remote system start/stop (dry contact supplied by BAS)
 - b. General Alarm (qty. 1, relay output from pump controller)
 - c. Process variable or VFD speed (qty. 1 4-20ma analog output supplied by pump controller)
 - d. System on/off status (qty. 1 relay output supplied by pump controller)
12. The following communication features shall be provided to the Building Automation System via an onboard RS-485 port utilizing None protocol:
 - a. All sensor process variables
 - b. Individual zone set points



Let's Solve Water

- c. Individual pump failure
- d. Individual pump on/off status
- e. Individual VFD on/off status
- f. VFD speed
- g. Individual VFD Failure
- h. Individual sensor failure

13. The pump logic controller shall be an ITT AquaForce VS pump controller. Enclosure shall be NEMA 1 with NEMA 4 rated operator interface.

Variable Frequency Drive

1. The Drive shall be rated to operate from 3-phase power at 208VAC to 600VAC, +10% /-15%, 48Hz to 63Hz. The drive shall employ a full wave rectifier to prevent input line notching and operate at a fundamental (displacement) input power factor of 0.98 at all speeds and nominal load. The drive efficiency shall be 98% or better at full speed and load. An internally mounted AC line reactor or DC choke shall be provided to reduce input current harmonic content, provide protection from power line transients such as utility power factor correction capacitor switching transients and reduce RFI emissions. When a DC choke is utilized it shall be of swinging choke design to mitigate harmonics substantially more than conventional choke designs and shall provide equivalent to 5% impedance. Unit shall be the ABB ACS 550 Series manufactured by ABB Drives & Power Products.

2. The VFD, including all factory-installed options, shall have UL and cUL approval.

3. Enclosure shall be NEMA 1 ventilated for installation as a wall mounted or freestanding unit, depending on the amp rating. Drive shall be equipped with an integrated fusible disconnect switch, pad lockable in the open position for safety during maintenance, and fuses to protect against ground faults.

4. VFD shall utilize a full wave rectifier to convert three phase AC to a fixed DC voltage. Power factor shall remain above 0.98 regardless of speed or load. VFD's employing power factor correction capacitors shall not be acceptable.

5. An internal line reactor (5% impedance) shall be provided to lower harmonic distortion of the power line and to increase the fundamental power factor.

6. The VFD shall be suitable for elevations to 3300. ft above sea level without derating. Maximum operating ambient temperature rating shall not be less than 104 deg F. VFD shall be suitable for operation in environments up to 95% non-condensing humidity.

7. The VFD shall be capable of displaying the following information in plain English via an alphanumeric display:

- a. Output Frequency
- b. Output Voltage
- c. Motor Current
- d. Kilo-watts per hour
- e. Fault identification with text
- f. Percent torque
- g. Percent power
- h. RPM

8. The VFD shall have the ability to automatically restart after an over-current, overvoltage, under-voltage, or loss of input signal protective trip. The number of restart attempts, trial time, and time between reset attempts shall be programmable.

9. Three (3) programmable critical frequency lockout ranges to prevent the VFD from operating the load continuously at an unstable speed.

10. Operator Control Panel (Keypad)

a. Each VFD shall be equipped with a front mounted operator control panel (keypad) consisting of a backlit, alphanumeric, graphic display and a keypad with keys for Start/Stop, Local/Remote, Up/Down and Help. Two (2) Softkeys will be provided which change functionality depending upon the position within the parameter hierarchy or state of panel.

b. All parameter names, fault messages, warnings and other information shall be displayed in complete English words or Standard English abbreviations to allow the user to understand what is being displayed without the use of a manual or cross-reference table.

c. The Display shall have contrast adjustment provisions to optimize viewing at any angle.

d. The control panel shall provide a real time clock for time stamping events and fault conditions.

e. The control panel shall include a feature for uploading parameter settings to control panel memory and downloading from the control panel to the same Drive or to another Drive.

f. All Drives throughout the entire power range shall have the same customer interface, including digital display, and keypad, regardless of horsepower rating.

g. The keypad shall be able to be installed or removed from the drive while it is powered, capable of remote mounting, and shall have its own non-volatile memory.

11. Protective Functions

a. For each programmed warning and fault protection function, the Drive shall display a message in complete English words or Standard English abbreviations. The three (3) most recent fault messages along with time, current, speed, voltage, frequency and DI Status shall be stored in the Drive's fault history. The last ten (10) fault names shall be stored in Drive memory.

b. The Drive shall include internal MOV's for phase to phase and phase to ground line voltage transient protection.

c. Output short circuit withstand rating and ground fault protection rated for 100,000 AIC shall be provided per UL508C without relying on line fuses. Motor phase loss protection shall be provided.

d. The Drive shall provide electronic motor overload protection qualified per UL508C.

e. Protection shall be provided for AC line or DC bus overvoltage at 130% of maximum rated or under voltage at 65% of min. rated and input phase loss.

f. A power loss ride through feature will allow the Drive to remain fully operational after losing power as long as kinetic energy can be recovered from the rotating mass of the motor and load.

g. Output short circuit withstand rating and ground fault protection rated for 100,000 AIC shall be provided per UL508C without relying on line fuses. Motor phase loss protection shall be provided.

h. The Drive shall provide electronic motor overload protection qualified per UL508C.

i. Protection shall be provided for AC line or DC bus overvoltage at 130% of maximum rated or under-voltage at 65% of min. rated and input phase loss.

j. A power loss ride through feature will allow the Drive to remain fully operational after losing power as long as kinetic energy can be recovered from the rotating mass of the motor and load.

12. Electrical

a. Pump Logic Controller Enclosure. Main station disconnect shall have a through door operator and shall be sized as shown in the technical data sheet. Individual integrated fusible drive disconnects shall have exterior operators, and shall be sized as shown in the technical data sheet. Station disconnect panel shall be housed in a NEMA 1 enclosure with integral latches. The control enclosure shall be constructed of 14-gauge steel and the back plate assembly shall be constructed of 14-gauge steel.

b. Controls and Enclosure. The control panel with controls shall be built in accordance with NEC, and shall comply with UL standards. Pump station manufacturer shall be authorized under UL508A to manufacture its own control panels. All equipment and wiring shall be mounted within the enclosure and each device shall be labeled with proper identification. All adjustments and maintenance shall be accessible from the front of the control enclosure. A complete wiring circuit diagram and legend with terminals, components, and wiring completely identified shall be provided. Main disconnect shall be interlocked with door.

13. Sensor / Transmitters

a. Pressure transducer shall be utilized for providing all pressure signals for the pump control logic. Pressure transducer shall be a solid-state bonded strain gage type with an accuracy of $\pm 0.5\%$ BFSL and constructed of 316 stainless steel. Transducer shall be rated for a pressure of 300 psi and shall provide gauge pressure output, rather than an absolute. Pressure transducer constructed of plastic is not acceptable. Pressure transducer shall be 4-20mA analog type with 10-28 VDC supply range and utilize a packard type connector to prevent moisture intrusion.

14. Flowmeter, when specified and shown in the plans

a. Provide an ITT ST-104 field mounted flow sensor transmitter as indicated on the plans. Unit shall transmit an isolated 4-20 mA dc signal indicative of process variable to the pump logic controller via standard two wire 24 VDC system. Unit shall consist of an insertion probe and separately mounted transmitter. The unit shall be accurate to within 1% of flow rate from 1.0 ft/sec to 30.0 ft/sec and shall withstand a static pressure of 200.0 psi g with negligible change in output.

15. Variable Speed System Sequence of Operation

a. The system shall consist of a Technologic 1500 pump logic controller with multi-pump parallel operation control, duty-standby pump selection, automatic alternation and automatic transfer to the standby pump upon pump/VFD failure.

b. The pumping system shall start upon the closure of customer's contact when the pump logic controller Mode of Operation is in REMOTE.

c. When the pump logic controller mode in LOCAL, the pumping system shall operate automatically.

d. Each sensor/transmitter shall send a 4-20mA signal to the Technologic 1500 pump logic controller, indicative of process variable condition.

e. When the set point is satisfied by the process variable, the pump speed shall remain constant at the optimum energy consumption level.

f. The pump controller shall automatically start the lag pumps as necessary to satisfy system demand.

g. As demand is satisfied, the controller shall automatically stop lag pumps as necessary to conserve energy.

h. In the event of a pump failure or a VFD fault, the pump logic controller automatically initiates a timed sequence of operation to start the redundant pump/VFD set in the variable speed mode.

i. In the event of the failure of a zone sensor/transmitter, its process variable signal shall be removed from the scan/compare program. The redundant zone sensor/transmitters, if available, shall remain in the scan/compare program for control.

j. PUMP or VFD fault shall be continuously scrolled through the display on the operator interface of the pump logic controller until the fault has been corrected and the controller has been manually reset.

k. When the system is satisfied, the pump controller shall shut down the single running lead pump and enter energy saving / no flow shutdown mode.

E. Pumps

F. Station Frame. The pump station frame shall be designed and fabricated to provide structural support for all attached equipment, and provide anchor bolt support. The base shall supply sufficient rigidity to withstand the stresses of reasonable and competent transportation to site, off loading, installation, and operation.

G. All piping shall be constructed from 304 stainless steel, schedule 10 or heavier pipe as required to maintain a 3 to 1 pressure safety factor (including 0.062 in corrosion allowance).

H. Isolation ball valves.

1. Isolation ball valves shall be certified to NSF-61 for use with potable drinking water.

2. Isolation ball valves shall be certified as low lead having wetted surface area with a weighted average lead content $< 0.25\%$.

3. Valves shall be rated for 600.0 psi g WOG / 150.0 psi g WSP for valves 0.25 in to 2.0 in and 400.0 psi g WOG / 125.0 psi g WSP for valves 2.5 in to 4.0 in.

4. Seats and stem packing shall be virgin PTFE. Stem shall be bottom loaded blowout proof design with fluorocarbon elastomer O-ring to prevent stem leaks.

5. Valves shall be 2-piece full port design.

I. Isolation Grooved Butterfly Valves.

1. Valves shall be certified to NSF-61 for use with potable drinking water.

2. Valve bodies shall be investment cast C8FM to ASTM A743 with integral neck and ISO mounting top.

3. Valve handle shall be a 304 stainless steel.

4. The disc shall be a dual-seal type, encapsulated either with Gr. E EPDM for cold and hot water services.

5. Valves shall be rated for 300.0 psi g CWP

J. Isolation lug style butterfly valve.

1. Valve shall be certified to NSF-61 for use with potable drinking water.

2. Valve body shall be made of ASTM 536 ductile iron and will be coated with an FDA approved epoxy. Valve face to face dimensions shall comply with API 609 and MSS-SP-67.

3. Disc shall be made of ASTM A-351 stainless steel. Shaft shall be made of 316SS.

4. Bushing shall be made of a Teflon®-Daron inner liner bonded to fiberglass-epoxy resin outer shell.

5. Seat shall be EPDM.

6. Valve shall be rated to 200.0 psi g WOG.

K. Threaded check valves.

1. All valve metallic components shall be 316SS.

2. Seat shall be Viton.



Let's Solve Water

3. Valve shall be rated for 400.0 psi g WOG.

L. Wafer check valves.

1. The valve body shall be constructed of ASTM A126 Class B cast iron for Class 125/150 and Class 250/300 valves.
2. The seat and disc shall be ASTM B584 Alloy C83600 cast bronze or ASTM B148 Alloy C95200 aluminum bronze.
3. The compression spring shall be ASTM A313 Type 316 Stainless Steel with ground ends.
4. Valve interiors and exteriors shall be coated with an NSF/ANSI-61 certified fusion bonded epoxy in accordance with AWWA C550.
5. The exterior of the valve shall be coated with a universal alkylid primer.
6. The valve design shall incorporate a center guided, spring loaded disc, guided at opposite ends and having a short linear stroke that generates a flow area equal to the nominal valve size.
7. The operation of the valve shall not be affected by the position of installation. The valve shall be capable of operating in the horizontal or vertical positions with the flow up or down.
8. All component parts shall be field replaceable without the need of special tools. A replaceable guide bushing shall be provided and held in position by the spring. The spring shall be designed to withstand 100,000 cycles without failure and provide a cracking pressure of 0.5 psi g.
9. The valve disc shall be concave to the flow direction providing for disc stabilization, maximum strength, and a minimum flow velocity to open the valve.
10. The valve disc and seat shall have a seating surface finish of 16 micro-inch or better to ensure positive seating at all pressures. The leakage rate shall not exceed the allowable rate for metal seated valves allowed by AWWA Standard C508 or 1 oz (30 ml) per hour per inch (mm) of valve diameter.
11. The valve flow way shall be contoured and unrestricted to provide full flow areas at all locations within the valve. Cv flow coefficients shall be equal to or greater than specified below and verified by an independent testing laboratory.

VALVE SIZE (inches (mm))	Wafer Style Cv
2 (50)	43
2.5 (65)	68
3 (80)	130
4 (100)	228
5 (125)	350
6 (150)	520

12. The valves shall be hydrostatically tested at 1.5 times their rated cold working pressure and seat tested at the valve CWP.

N. Pressure Gauges.

1. Gauges shall be provided for the suction and discharge manifold.
 2. Accuracy shall be $\pm 1.5\%$
 3. Bourdon tube and connection shall be constructed of 316SS.
 4. Case, bezel and internals shall be constructed of 316SS.
 5. Gauge shall be filled with glycerin in order to dampen pulsation and vibration and to provide lubrication to the internal parts.
 6. Gauge range shall be selected to cover the largest operating range for the specific conditions and pump selected.
- O. Flange Bolts. Bolts shall be zinc plated and shall meet ASTM Grade A193 B7.
- P. Paint. The finish coat shall be acrylic enamel to a thickness of no less than 3 mils.

Part 3 EXECUTION

3.1 INSTALLATION

- A. Install equipment in accordance with manufacturer's instructions.
- B. The contractor shall align the pump and motor shafts to within the manufacturer's recommended tolerances prior to system start-up.
- C. Power wiring, as required, shall be the responsibility of the electrical contractor. All wiring shall be performed per manufacturer's instructions and applicable state, federal and local codes.
- D. Control wiring for remote mounted switches and sensor / transmitters shall be the responsibility of the controls contractor. All wiring shall be performed per manufacturer's instructions and applicable state, federal and local codes.

3.2 DEMONSTRATION

- A. The system manufacturer or factory trained representative shall provide start-up of the packaged pumping system. This start-up shall include verification of proper installation, system initiation, adjustment and fine tuning. Start-up shall not be considered complete until the sequence of operation, including all alarms, has been sufficiently demonstrated to the owner or owner's designated representative. This job site visit shall occur only after all hook-ups, tie-ins, and terminations have been completed and signed-off on the manufacturer's start-up request form.
- B. The system manufacturer or factory trained representative shall provide on-site training for owner's personnel. This training shall fully cover maintenance and operation of all system components.
- C. The system manufacturer must have a complete pressure booster training program available for owner's personnel. The training sessions shall take place at the manufacturer's facility and cover all aspects of pressure booster system design, service and operation.

3.3 WARRANTY

- A. The manufacturer shall warrant the water pumping system to be free of defects in material and workmanship for one year (12 months) from date of authorized start-up, not to exceed eighteen (18) months from date of manufacturer's invoice. Complete terms and conditions will be provided upon request.



3.4 START-UP SERVICE

A. When discharge piping, electrical connections, and electrical inspection have been completed, the pump station representative shall be contacted for start up. A minimum two-week notice shall be given to manufacturer representative prior to scheduled start up date. During start up, the complete pumping system shall be given a running test of normal start and stop, and fully loaded operating conditions. During this test, each pump shall demonstrate its ability to operate without undue vibration, or overheating, and shall demonstrate its general fitness for service. All defects shall be corrected and adjustments shall be made to the pumping station for satisfactory operation. System problems or concerns will be corrected by the general contractor or site station staff, in conjunction with the appropriate factory representative. Testing shall be repeated until satisfactory results are obtained, as determined by the engineer. Start up assistance will be provided by the factory representative and will be limited to one 8-hour day, unless previously negotiated by the factory representative.



Unit Dimensions

Booster Package

MODEL: AquaForce

Hydraulic Data					Motor Data	e-SV Pump	Qty.
Maximum Flow	Flow at Duty Point	Maximum TDH	TDH at Duty Point	NPSHR	Voltage/Phase/HP/Enclosure		
449.4 gpm	700.0 gpm	370.8 ft	207.5 ft	17.0 ft	230/460V 3 PH 40.0 hpDPPE	V2VJE6P32E2K	2

Submittal Prepared for: GICON PUMPS & EQUIPMENT

Engineer:

Submittal Prepared by: Debbie Gardner

Submittal Date: May 11, 2012

Job:

Contractor:

Company:

Approved by:

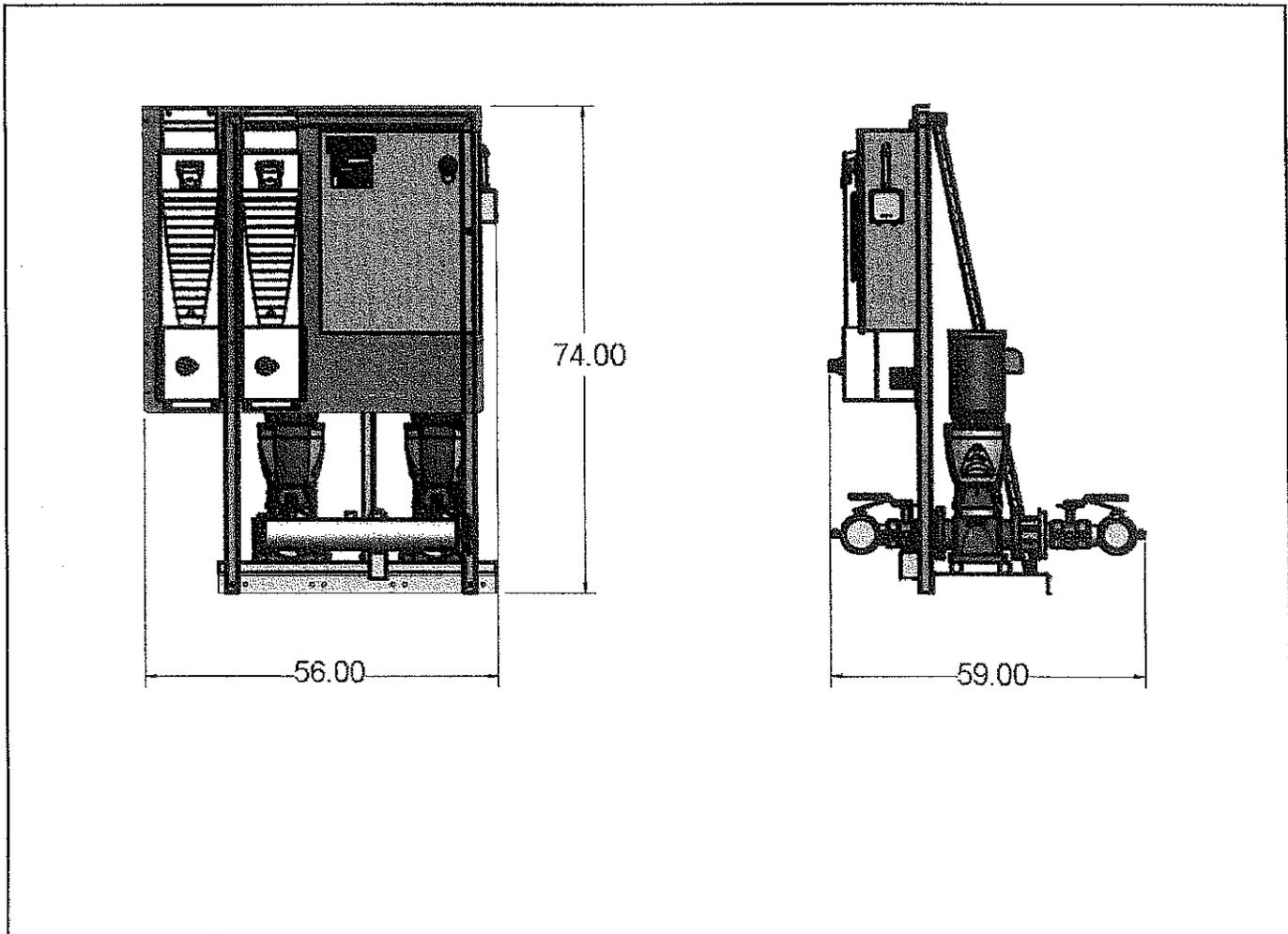
Proposal No: DG12-05-11 01

Item No: ITEM 001

Date: May 11, 2012

• For a more detailed mechanical drawing

[Click here](#)



- Dimensions are subject to change. Not to be used for construction purposes unless certified
- All dimensions shown are in inches unless otherwise stated



Panel Wiring Diagram

Submittal Prepared for: GICON PUMPS & EQUIPMENT

Engineer:

Submittal Prepared by: Debbie Gardner

Submittal Date: May 11, 2012

Job:

Contractor:

Company:

Approved by:

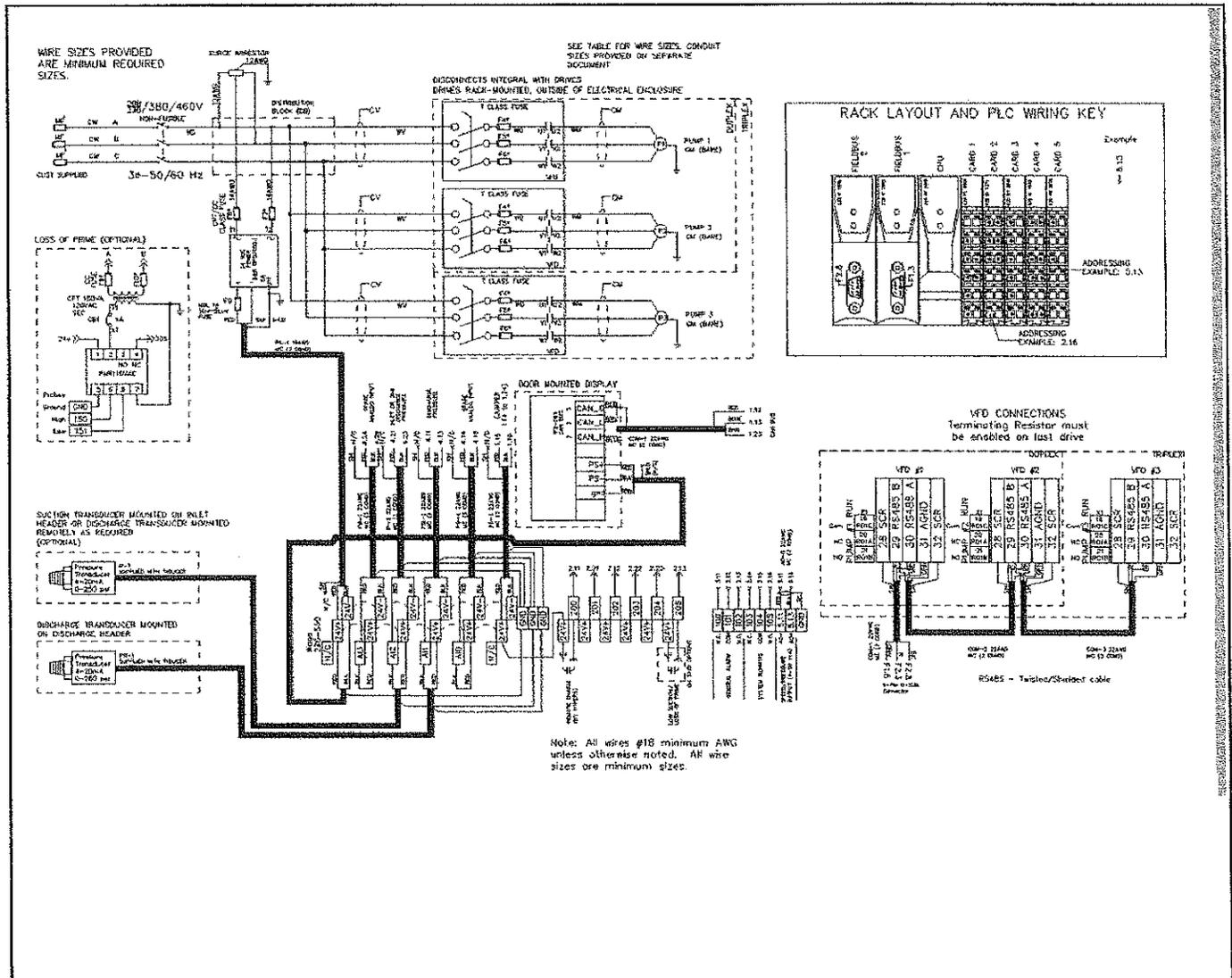
Proposal No: DG12-05-11 01

Item No: ITEM 001

Date: May 11, 2012

• For a more detailed panel wiring diagram

[Click here](#)





Performance Data

Booster package

MODEL: e-SV

Hydraulic Data					Motor Data	e-SV Pump	Qty.
Maximum Flow	Flow at Duty Point	Maximum TDH	TDH at Duty Point	NPSHR	Voltage/Phase/Enclosure		
449.4 gpm	700.0 gpm	370.8 ft	207.5 ft	17.0 ft	230/460V 3 PH DPPE	V2VJE6P32E2K	2

Submittal Prepared for: GICON PUMPS & EQUIPMENT

Engineer:

Submittal Prepared by: Debbie Gardner

Submittal Date: May 11, 2012

Job:

Contractor:

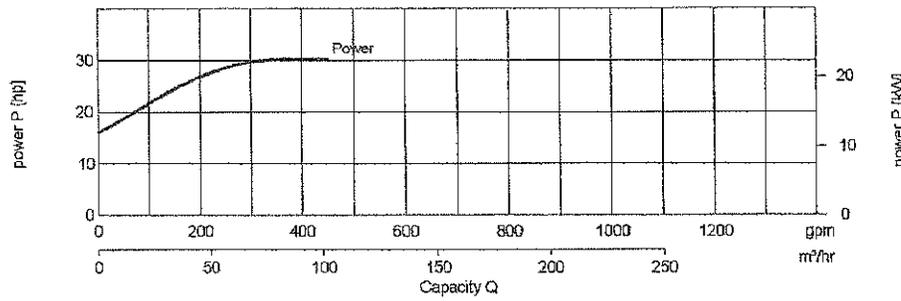
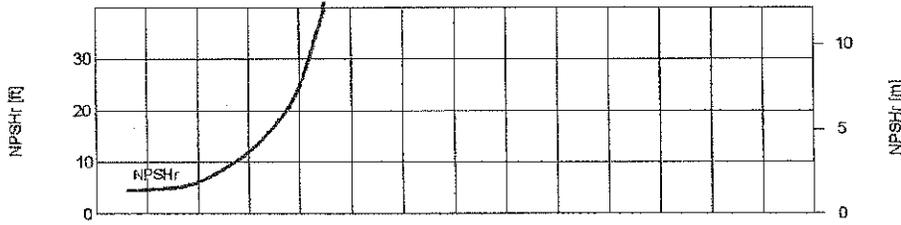
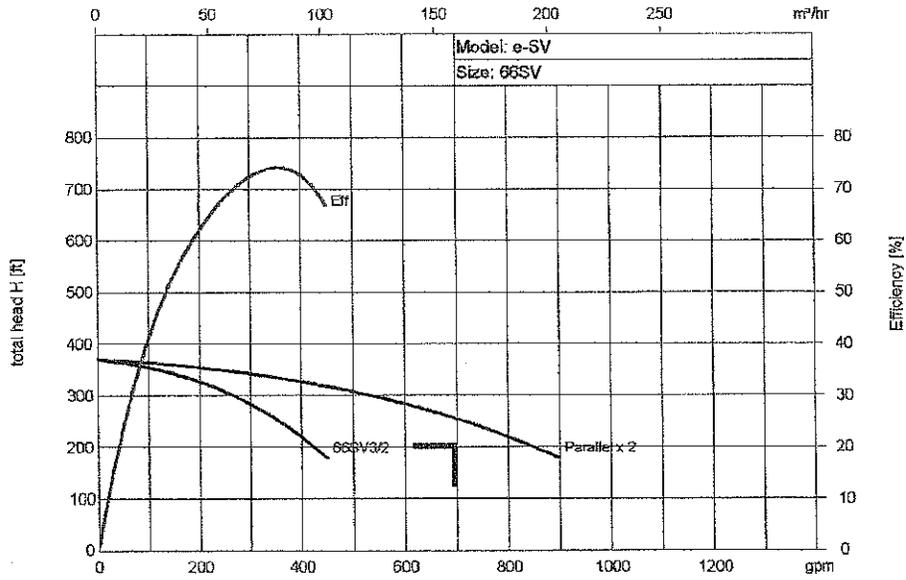
Company:

Approved by:

Proposal No: DG12-05-11 01

Item No: ITEM 001

Date: May 11, 2012





Performance Data

Booster Package

MODEL: e-SV

Hydraulic Data					Motor Data	e-SV Pump	Qty.
Maximum Flow	Flow at Duty Point	Maximum TDH	TDH at Duty Point	NPSHR	Voltage/Phase/Enclosure		
449.4 gpm	700.0 gpm	370.8 ft	207.5 ft	17.0 ft	230/460V 3 PH DPPE	V2VJE6P32E2K	2

Submittal Prepared for: GICON PUMPS & EQUIPMENT

Job:

Proposal No: DG12-05-11 01

Engineer:

Contractor:

Item No: ITEM 001

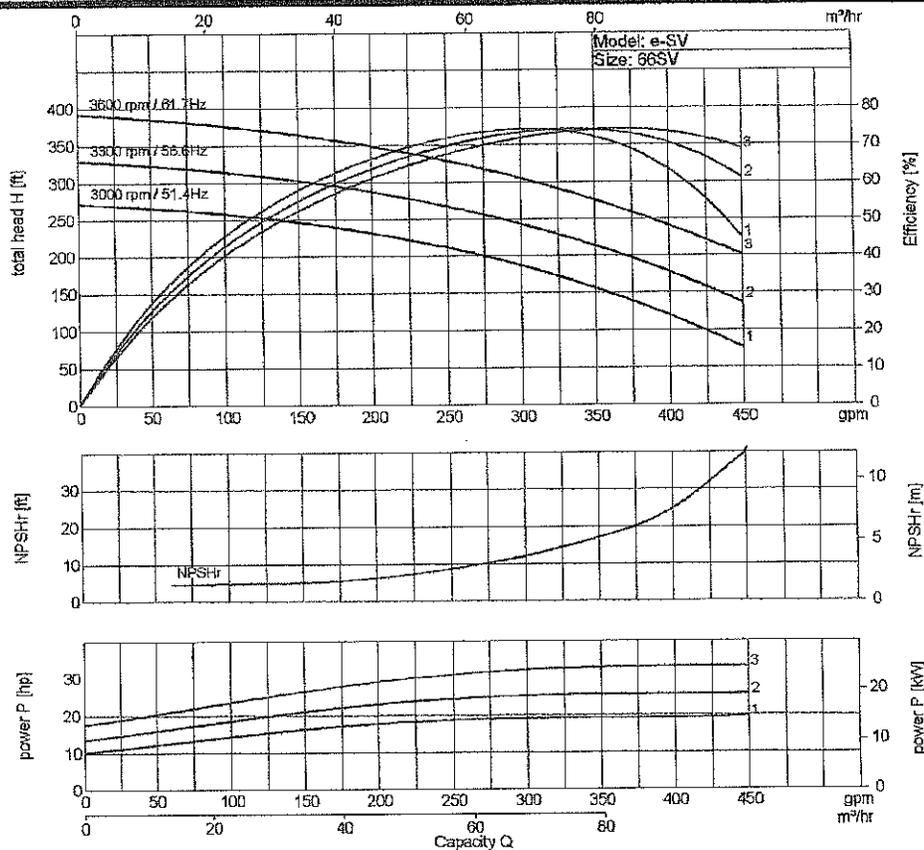
Submittal Prepared by: Debbie Gardner

Company:

Date: May 11, 2012

Submittal Date: May 11, 2012

Approved by:





Model	e-SV
Speed	Variable
Liquid	
Nom. Temperature	70.0 deg F
Spec. Gravity	1.000
Viscosity	1.000 cp
Vapor Press	
Solids% / Size	

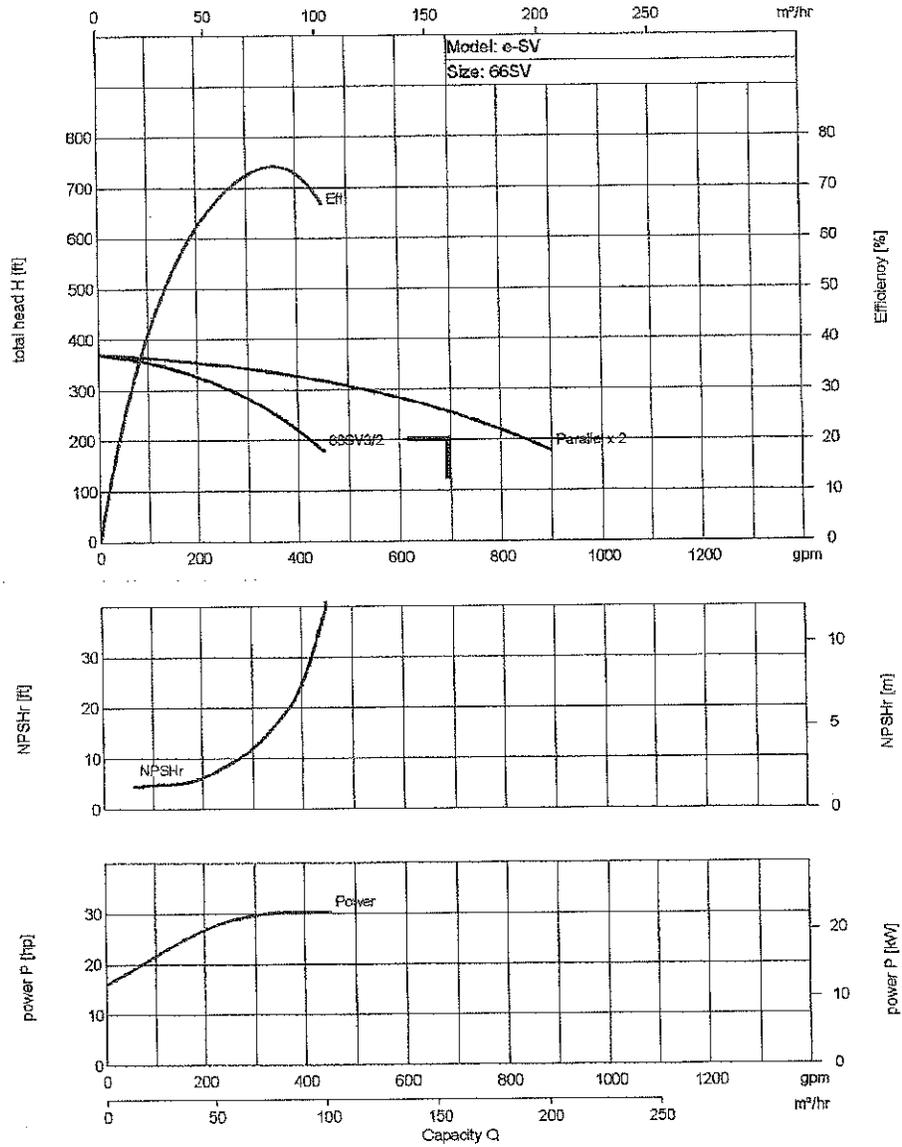
Size	66SV
Frequency	60Hz
Date	05/11/2012
Issued by:	Debbie Gardner
Quotation No.	DG12-05-11 01
Job/Inq.No.	
Order No.	

Purchaser	GICON PUMPS & EQUIPMENT
End User	
Item No.	ITEM 001
Service	
Certified By	

Rated Operating Point

Capacity	700.0 gpm	Power - Pump	24.60 hp	No. of Stages	3
Head	207.5 ft	Power - Others		Imp. Diameter:	6.0000 in
NPSHa		Power - Totals	24.60 hp	Imp. Dia. Adl Stg:	
NPSHr	17.0 ft	Power - max.	30.3 hp	Min. Hydraulic Flow	60.0 gpm
Rated Efficiency	149.0 %			Min. Thermal Flow	N/A
Suction Spec. Speed	7,396 gpm(US) ft				

Notes:



CARLSON AND SON'S ELECTRIC LLC

3093 Sunset Lane-Lakeside, AZ 85929

Phone: 928-368-5454 Fax 928-368-5453

Email: cselectric@cableone.net

To: City of Holbrook Water Booster Pump Replacements
Date; 5/30/12

We hereby propose to furnish all labor and material necessary to provide the installation of electrical located at the city of Holbrook booster site in accordance with the following specifications.(this price excludes formed concrete and hard rock):

Randy

Attached is the pricing for the booster pumps as per our conversations and the mandatory meeting. Let us know if you need more info.

Thanks, Duane

Cell #928-205-8560

This proposal is void if not accepted in writing within 30 days after this date. Accepted by
_____ Carlson & Sons Electric

Customers paying with MasterCard/Visa/American Express please add 3% to bid price for processing of these cards.

CARLSON AND SON'S ELECTRIC LLC

3093 Sunset Lane-Lakeside, AZ 85929

Phone: 928-368-5454 Fax 928-368-5453

Email: cselectric@cableone.net

The Fairbanks Morse pumps are the same style as the ones you now have. There are 3 different pumps to choose from.

1) 6" 2 stage pump with 75 HP 1200 RPM motor. This pump has type 21 double mechanical seals. This price installed and hooked up electrically, not mechanically.

\$ 28,243.00 each x 2=\$56,486.00 + tax= \$60,194.30

New soft start installed with surge suppression, H.O.A., and panel heater \$ 10,623.00
x2=\$21,246.00 + Tax= \$22,640.79

Change the motor to a premium efficient motor that is 95% efficient add \$7,466.00
x2=\$14,932.00 + tax = \$15,912.28

2) 5" 1 stage pump with a 100HP 1750 RPM motor. This pump has type 21 double mechanical seals. This price installed and hooked up electrically, not mechanically.

\$25,474.00 each x 2= \$50,948.00 + tax =\$54,292.73

New soft start installed with surge suppression, H.O.A., and panel heater \$10,623.00
x2=\$21,246.00 + tax =\$22,640.79

Change the motor to a premium efficient motor that is 95.4% efficient add \$2,861.00
x2=\$5,722.00 + tax =\$6,079.64

3) 4" 1 stage pump with a 75 HP 3600 RPM motor. This pump has type 21 double mechanical seals. This price installed and hooked up electrically, not mechanically.

\$18,953.00 each x 2= \$37,906.00 + tax =\$20,197.26

New soft start installed with surge suppression, H.O.A., and panel heater \$10,623.00 each
x2=\$21,246.00 + tax =\$22,640.79

Change the motor to a premium efficient motor that is 94.1% efficient add \$1,680.00 each
x2= \$3,360.00 + tax =\$3,580.58

These pumps can be hooked up mechanically by Carlson and Son's Electric by a quote or parts at cost plus 10 % Labor at \$40.00 per man hour + tax.

New Berkeley Pumps

The Berkeley B5EPBMS 100 HP pump has a premium efficiency motor open drip proof. This pump rated 1200 GPM at 200 ft- Head and has an efficiency rating of 72.48%. This pump can also be fitted with a standard motor at a discounted price. This pump is an end suction pump similar to your small existing pump and will take some different piping than the existing pump. This pump has a mechanical seal so it will not drip water.

The price for this pump and motor installed and hooked up electrically, not mechanically will be \$16,039.00 per pump x2= \$32,078.00 + tax = \$34,183.92

The mechanical hook up can be quoted or done with parts, cost + 10% and Labor at \$40.00 per man hour + tax. Per pump

The starter we recommend is an electronic soft start because these pumps come up to maximum speed and run at maximum speed so there is no need for a VFD. A VFD is only needed if you want to run at a different speed. Slowing a booster pump reduces the pump efficiency. This starter also has across the line option. The price for the soft start panel installed and hooked up is \$10,381.00 per each x2= \$20,762.00 + tax = \$22,125.02

Optional add on Strike Sorb Surge Protection +\$ 1,079.00 per each 2= \$2,158.00

If you want a VFD the extra cost is +\$2,259.00 per each x2= \$4,518.00 + tax = \$4,814.60

See attached for pumps and curves. Thanks Duane Carlson 928-205-8560



Hydro Mechanical Solutions

201 South 26th Street
 Phoenix, AZ. 85034
 Phone: (602) 996-3444
 Fax: (602) 996-9408

DATE
5/24/2012

QUOTE NO :
12-6152R1

TO :
Carlson Electric & Water Works 1332 Flag Hollow Road Lakeside, AZ 85929 attn: Duane Carlson

QUOTATION

REFERENCE	TERMS	SHIP VIA	FOB POINT	SALESPERSON
Holbrook Pump Replacement	Net 30	Best Way	Factory	Scott Smith
QTY	DESCRIPTION	UNIT PRICE	AMOUNT	
2	Fairbanks Morse model 6" 1922B, 2-stg horizontal splitcase bronze fitted pumps designed to deliver 1,200 GPM @ 200' TDH. Pump will use a Marathon 75 HP, 1200 RPM, 460v, 3PH horizontal ODP motor. Includes steel base and coupling with coupling guard. Pumps will use John Crane type 21 double mechanical seals. ADD for US Motors premium efficient motor which is 95% efficient. Two additional options:			
2	Fairbanks Morse model 5" 1823, horizontal splitcase, bronze fitted pumps designed to deliver 1,200 GPM @ 200' TDH. Pump will use a Marathon 100 HP, 1750 RPM, 460v, 3PH horizontal ODP motor. Includes steel base and coupling with coupling guard. Pumps will use John Crane type 21 double mechanical seals. ADD for Baldor premium efficient motor which is 95.4% efficient.			
2	Fairbanks Morse model 4" 1822B, horizontal splitcase bronze fitted pumps designed to deliver 1,200 GPM @ 200' TDH. Pump will use a Marathon 75 HP, 3600 RPM, 460v, 3PH horizontal ODP motor. Includes steel base and coupling with coupling guard. Pumps will use John Crane type 21 double mechanical seals. ADD for Baldor premium efficient motor which is 94.1% efficient.			
2	NEMA 3R simplex control panels to operate one (1) 75HP, 460v, 3Ph motor. Options include motor overload protection, surge protection, soft starters, auxiliary contacts for use with level controls, H-O-A switch and panel heater.			
GRAND TOTAL				

Prices quoted are firm for your acceptance for 30 days.
 This quotation and any resulting order will be subject to our standard terms and conditions of sale.
 Prices do not include spare parts unless specifically itemized above.



Hydro Mechanical Solutions

201 South 26th Street
 Phoenix, AZ. 85034
 Phone: (602) 996-3444
 Fax: (602) 996-9408

DATE
5/24/2012

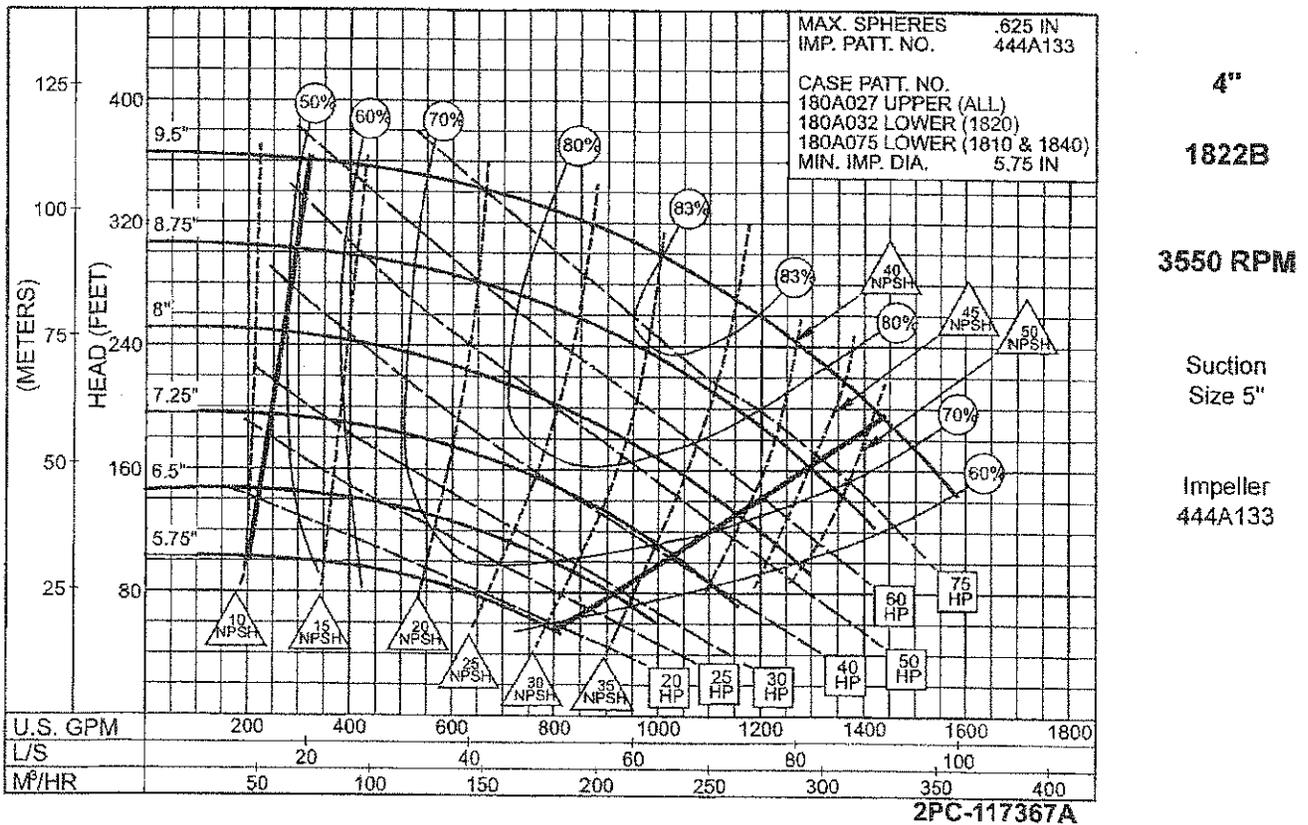
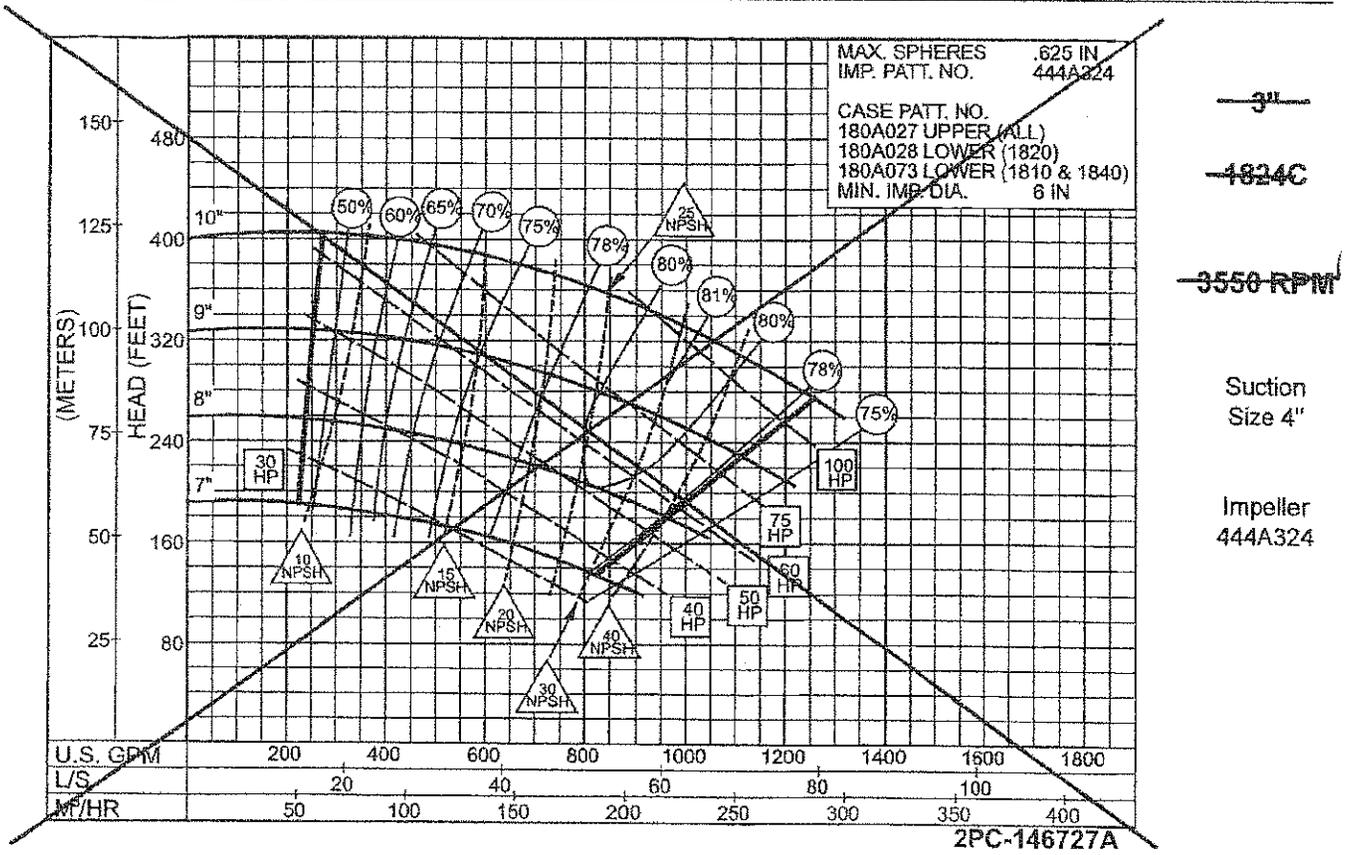
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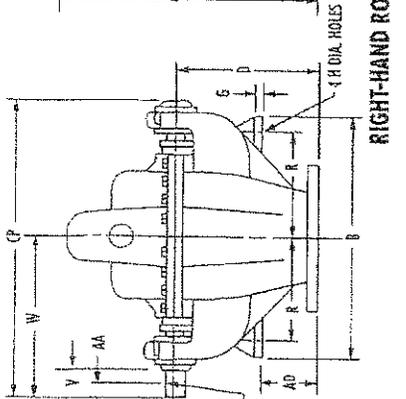
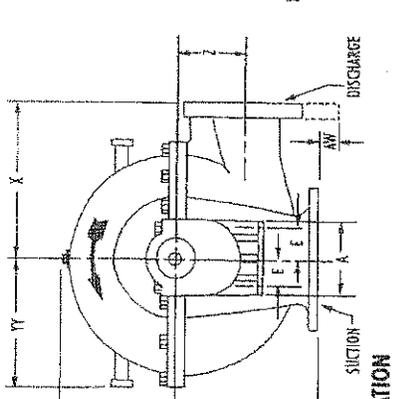
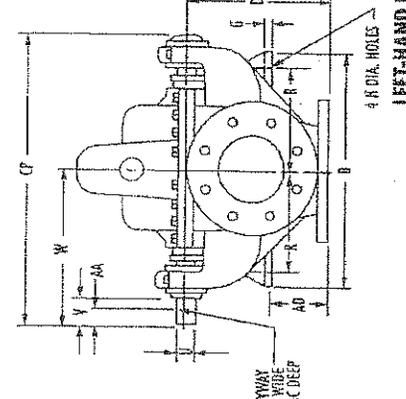
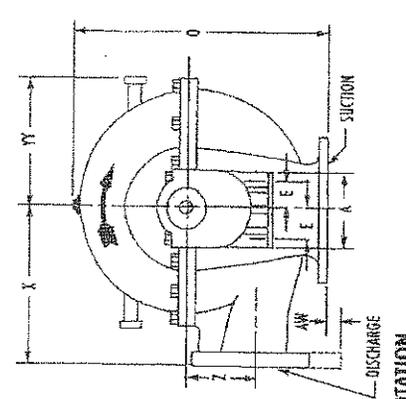
TO :
 Carlson Electric & Water Works
 1332 Flag Hollow Road
 Lakeside, AZ 85929
 attn: Duane Carlson

QUOTATION

REFERENCE	TERMS	SHIP VIA	FOB POINT	SALESPERSON
Holbrook Pump Replacement	Net 30	Best Way	Factory	Scott Smith
QTY	DESCRIPTION		UNIT PRICE	AMOUNT
	Freight to Holbrook, project O&M's and start-up are included with this pricing. Delivery is 10-12 weeks ARO.			
GRAND TOTAL				

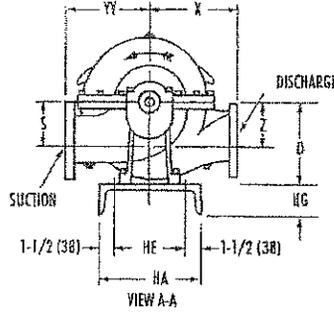
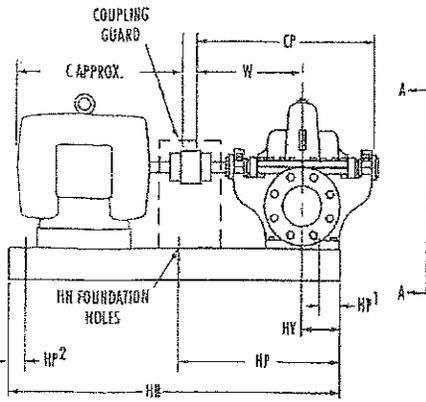
Prices quoted are firm for your acceptance for 30 days.
 This quotation and any resulting order will be subject to our standard terms and conditions of sale.
 Prices do not include spare parts unless specifically itemized above.



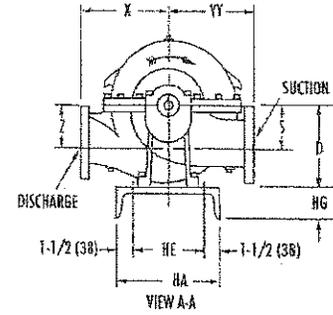


Pump	Disch.	Suction	Power Series	A	B	D	E	G	H	Q	R	S	U	V	W	K	Z	AA	AB	AC	AD	AW	AX	CP	YY
2" 1823	2	2-1/2	1	6-1/2 (165)	8 (203)	7 (178)	2-3/4 (70)	5/8 (16)	1/2 (13)	13-3/8 (340)	3-1/4 (86)	3-1/2 (89)	3/4 (19)	3-1/2 (89)	11-5/8 (295)	8-1/2 (216)	3-1/2 (89)	2	3/16 (5)	3/32 (2)	8-3/8 (213)	-	1/4 (6)	20-1/2 (517)	9 (229)
2" 1824	2	2-1/2	1	6-1/2 (165)	8 (203)	7 (178)	2-3/4 (70)	5/8 (16)	1/2 (13)	13-3/8 (340)	3-1/4 (86)	3-1/2 (89)	3/4 (19)	3-1/2 (89)	11-5/8 (295)	8-1/2 (216)	3-1/2 (89)	2	3/16 (5)	3/32 (2)	8-3/8 (213)	-	1/4 (6)	20-1/2 (517)	9 (229)
2" 1825	2	2-1/2	1	6-1/2 (165)	8 (203)	8 (216)	2-3/4 (70)	5/8 (16)	1/2 (13)	13-3/8 (340)	3-1/4 (86)	4 (102)	3/4 (19)	3-1/2 (89)	11-5/8 (295)	10 (254)	4 (102)	2	3/16 (5)	3/32 (2)	8-3/8 (213)	-	-	20-1/2 (517)	10-3/4 (269)
2-1/2" 1823	2-1/2	3	2	8 (216)	10 (254)	8 (216)	3-1/2 (89)	3/4 (19)	5/8 (16)	16 (406)	4 (102)	4 (102)	1-1/8 (29)	2-7/8 (72)	13-1/2 (343)	9-3/4 (248)	4 (102)	2-1/8 (51)	1/4 (6)	1/8 (3)	9-1/2 (231)	-	-	24 (610)	10 (254)
2-1/2" 1824	2-1/2	3	2	8 (216)	10 (254)	9 (225)	3-1/2 (89)	3/4 (19)	5/8 (16)	17-1/4 (438)	4 (102)	4 (102)	1-7/8 (47)	2-7/8 (72)	13-1/2 (343)	11 (279)	4 (102)	2-1/8 (51)	1/4 (6)	1/8 (3)	9-1/2 (231)	-	-	24 (610)	11-1/2 (292)
3" 1824	3	4	2	10 (254)	12 (305)	10 (254)	3-1/2 (89)	3/4 (19)	5/8 (16)	16-1/4 (413)	4 (102)	4 (102)	1-1/8 (29)	2-7/8 (72)	13-1/2 (343)	10 (254)	4 (102)	2-1/8 (51)	1/4 (6)	1/8 (3)	9-1/2 (231)	-	1/2 (13)	24 (610)	11 (279)
3" 1825	3	4	2	10 (254)	12 (305)	10 (254)	3-1/2 (89)	3/4 (19)	5/8 (16)	16-1/4 (413)	4 (102)	4 (102)	1-1/8 (29)	2-7/8 (72)	13-1/2 (343)	12 (305)	5 (127)	2-1/8 (51)	1/4 (6)	1/8 (3)	9-1/2 (231)	-	-	24 (610)	13 (330)
4" 1822	4	5	2	12 (305)	14 (356)	12 (305)	4-1/4 (111)	7/8 (18)	3/4 (19)	18-3/8 (467)	5 (127)	5 (127)	1-3/8 (34)	3-1/2 (89)	14-1/2 (366)	12 (305)	5 (127)	2-3/8 (60)	3/8 (9.5)	1/2 (13)	10-1/2 (267)	-	1-1/8 (29)	24 (610)	13-1/4 (337)
4" 1823C	4	5	3	12 (305)	14 (356)	12 (305)	4-1/4 (111)	7/8 (18)	3/4 (19)	18-3/8 (467)	5 (127)	5 (127)	1-3/8 (34)	3-1/2 (89)	14-1/2 (366)	12 (305)	5 (127)	2-3/8 (60)	3/8 (9.5)	1/2 (13)	10-1/2 (267)	-	1-1/8 (29)	24 (610)	13-1/4 (337)
4" 1823D	4	5	3	12 (305)	14 (356)	12 (305)	4-1/4 (111)	7/8 (18)	3/4 (19)	18-3/8 (467)	5 (127)	5 (127)	1-3/8 (34)	3-1/2 (89)	14-1/2 (366)	12 (305)	5 (127)	2-3/8 (60)	3/8 (9.5)	1/2 (13)	10-1/2 (267)	-	1-1/8 (29)	24 (610)	13-1/4 (337)
4" 1824	4	5	3	12 (305)	14 (356)	12 (305)	4-1/4 (111)	7/8 (18)	3/4 (19)	18-3/8 (467)	5 (127)	5 (127)	1-3/8 (34)	3-1/2 (89)	14-1/2 (366)	13 (330)	5 (127)	2-3/8 (60)	3/8 (9.5)	1/2 (13)	10-1/2 (267)	-	1-1/8 (29)	24 (610)	14 (356)
4" 1825	4	6	4	12 (305)	14 (356)	12 (305)	4-1/4 (111)	7/8 (18)	3/4 (19)	19-3/4 (502)	5 (127)	5 (127)	1-3/8 (34)	3-1/2 (89)	14-1/2 (366)	14 (356)	5 (127)	2-3/8 (60)	3/8 (9.5)	1/2 (13)	10-1/2 (267)	-	1-1/8 (29)	24 (610)	16 (406)
5" 1822	5	6	4	14 (356)	16 (406)	14 (356)	4-1/4 (111)	7/8 (18)	3/4 (19)	20-1/2 (517)	5 (127)	5 (127)	1-3/8 (34)	3-1/2 (89)	14-1/2 (366)	16 (406)	5 (127)	2-3/8 (60)	3/8 (9.5)	1/2 (13)	10-1/2 (267)	-	1-1/8 (29)	24 (610)	16 (406)
5" 1823	5	6	4	14 (356)	16 (406)	14 (356)	4-1/4 (111)	7/8 (18)	3/4 (19)	20-1/2 (517)	5 (127)	5 (127)	1-3/8 (34)	3-1/2 (89)	14-1/2 (366)	16 (406)	5 (127)	2-3/8 (60)	3/8 (9.5)	1/2 (13)	10-1/2 (267)	-	1-1/8 (29)	24 (610)	16 (406)
5" 1824	5	6	4	14 (356)	16 (406)	14 (356)	4-1/4 (111)	7/8 (18)	3/4 (19)	20-1/2 (517)	5 (127)	5 (127)	1-3/8 (34)	3-1/2 (89)	14-1/2 (366)	16 (406)	5 (127)	2-3/8 (60)	3/8 (9.5)	1/2 (13)	10-1/2 (267)	-	1-1/8 (29)	24 (610)	16 (406)
6" 1822	6	8	4	16 (406)	18 (457)	16 (406)	4-1/4 (111)	7/8 (18)	3/4 (19)	21-1/2 (543)	5 (127)	5 (127)	1-3/8 (34)	3-1/2 (89)	14-1/2 (366)	18 (457)	5 (127)	2-3/8 (60)	3/8 (9.5)	1/2 (13)	10-1/2 (267)	-	1-1/8 (29)	24 (610)	18 (457)
6" 1822HH	6	8	4A	16 (406)	18 (457)	16 (406)	4-1/4 (111)	7/8 (18)	3/4 (19)	21-1/2 (543)	5 (127)	5 (127)	1-3/8 (34)	3-1/2 (89)	14-1/2 (366)	18 (457)	5 (127)	2-3/8 (60)	3/8 (9.5)	1/2 (13)	10-1/2 (267)	-	1-1/8 (29)	24 (610)	18 (457)
8" 1821	8	8	4	20 (508)	24 (610)	20 (508)	4-1/4 (111)	7/8 (18)	3/4 (19)	25-1/2 (643)	5 (127)	5 (127)	1-3/8 (34)	3-1/2 (89)	14-1/2 (366)	20 (508)	5 (127)	2-3/8 (60)	3/8 (9.5)	1/2 (13)	10-1/2 (267)	-	1-1/8 (29)	24 (610)	20 (508)

NOTES:
 1. All dimensions in inches (mm).
 2. Dimensions may vary ± 3/8" (10).
 3. Not for construction purposes unless certified.
 4. Discharge and suction flanges - ANSI Standard flange face.
 STD. 125# FLANGES OPT. 250# FLANGES



RIGHT-HAND ROTATION



LEFT-HAND ROTATION

STANDARD STEEL BASE

BASE	SIZE	HA	HB	HE	HG	HH		HP	HP1	HP2
						QTY	SIZE			
2	10 x 26	10 (254)	28 (711)	7 (178)	2-5/8 (67)	2	5/8 (16)	14 (356)	-	-
3	12 x 30	12 (305)	30 (762)	9 (229)	3 (76)	2	5/8 (16)	15 (381)	-	-
4	12 x 34	12 (305)	34 (864)	9 (229)	3 (76)	4	5/8 (16)	20 (508)	-	1 (25)
5	12 x 38	12 (305)	38 (965)	9 (229)	3 (76)	4	5/8 (16)	20 (508)	-	1 (25)
6	13 x 38	13 (330)	38 (965)	10 (254)	4 (102)	4	3/4 (19)	-	1 (25)	1 (25)
7	13 x 42	13 (330)	42 (1067)	10 (254)	4 (102)	4	3/4 (19)	24 (610)	-	1 (25)
8	15 x 40	15 (381)	40 (1016)	12 (305)	3-3/8 (86)	4	3/4 (19)	-	1 (25)	1 (25)
9	15 x 44	15 (381)	44 (1118)	12 (305)	3-3/8 (86)	4	3/4 (19)	24 (610)	-	1 (25)
10	18 x 44	18 (457)	44 (1118)	15 (381)	4 (102)	4	3/4 (19)	-	1 (25)	1 (25)
11	18 x 48	18 (457)	48 (1219)	15 (381)	4 (102)	4	3/4 (19)	-	1 (25)	1 (25)
12	18 x 54	18 (457)	54 (1372)	15 (381)	4 (102)	4	3/4 (19)	-	1 (25)	1 (25)
15	22 x 60	22 (559)	60 (1524)	19 (483)	4 (102)	4	3/4 (19)	-	1 (25)	1 (25)

NOTE: WHEN 2 "D" DIMENSIONS ARE INDICATED ALWAYS USE THE LARGER FIGURE.

DISCH.	SUCT.	CASE BORE	POWER SERIES	PUMP SIZE		W	X	Z	CP	HY	YY
				1	5						
2	2-1/2	9	1	7 (178)	3-1/2 (89)	11-5/8 (295)	8-1/2 (216)	3-1/2 (89)	20-1/2 (521)	4 (102)	9 (229)
2	2-1/2	10		7 (178)	3-1/2 (89)		10 (254)	4 (102)			9 (229)
2	2-1/2	12		8 (203)	4 (102)		10 (254)	4 (102)			10-3/4 (273)
2-1/2	3	10B		8 (203)	4 (102)		9-3/4 (248)	4 (102)			10 (254)
2-1/2	3	12	2	9** (229)**	4-1/2 (114)	13-1/2 (343)	11 (279)	4-1/2 (114)	24 (610)	5 (127)	11-1/2 (292)
3	4	10B & C		9** (229)**	4-1/2 (114)		10 (254)	5 (127)			11 (279)
3	4	14		10 (254)	5 (127)		10 (254)	5 (127)			13 (330)
4	5	10B		9** (229)**	4-5/8 (118)		10 (254)	4-1/2 (114)			11-1/4 (286)
4	5	11A & C	3	10† (254)†	5 (127)	14-1/2 (368)	11-1/4 (286)	5 (127)	26 (660)	6 (152)	12-3/4 (324)
4	4	11D		10† (254)†	5 (127)		12 (305)	5 (127)			12-3/4 (324)
4	4	15		11 (279)	5-1/2 (140)		13 (330)	5-1/2 (140)			14 (356)

PUMP SIZE	FRAME	143T	145T	182T	184T	213T	215T	254T	256T	284TS	284T	286TS	286T	324TS	324T	326TS	326T	364TS	364T	365TS	365T	404TS	405TS	444TS
		C	13 (330)	13 (330)	13 (330)	14 (356)	16 (406)	18 (457)	21 (533)	23 (584)	22 (559)	24 (610)	24 (610)	25 (635)	25 (635)	26 (660)	26 (660)	28 (711)	27 (686)	29 (711)	28 (711)	30 (762)	31 (787)	34 (864)
	D	-	-	-	-	-	-	-	-	-	-	-	-	B (203)	B (203)	8 (203)	9 (229)	9 (229)	9 (229)	9 (229)	9 (229)	10 (254)	10 (254)	11 (279)
2" 1823	BASE																							
2" 1824	BASE		2		3		4		6		8		9		10									
2" 1825	BASE																							
2-1/2" 1823B	BASE																							
2-1/2" 1824	BASE																							
3" 1824B	BASE		3		4		5		7		9		10		11		10		11		12			
3" 1825	BASE																							
4" 1822B	BASE																							
4" 1823A&C	BASE																							
4" 1823D	BASE				5		7		9					11						12			15	
4" 1824	BASE																							

NOTES:

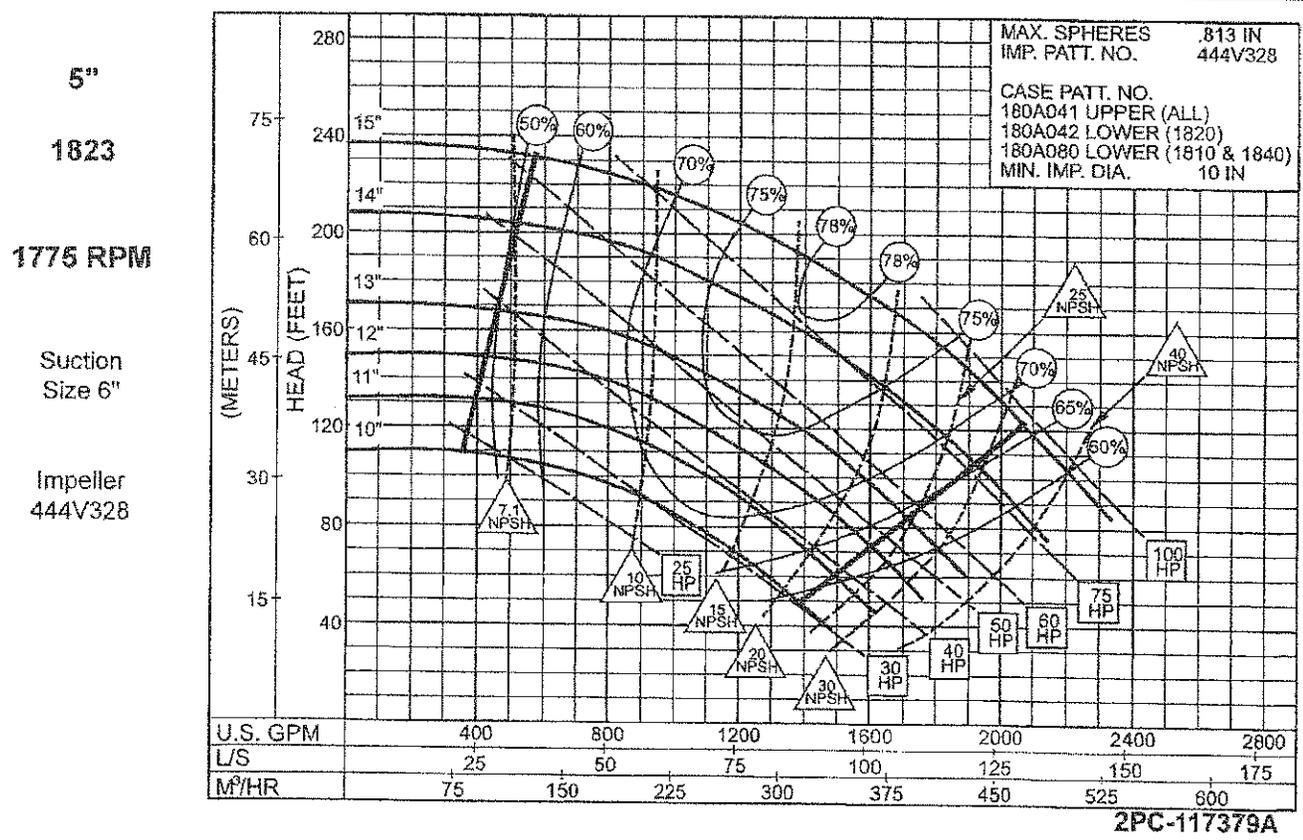
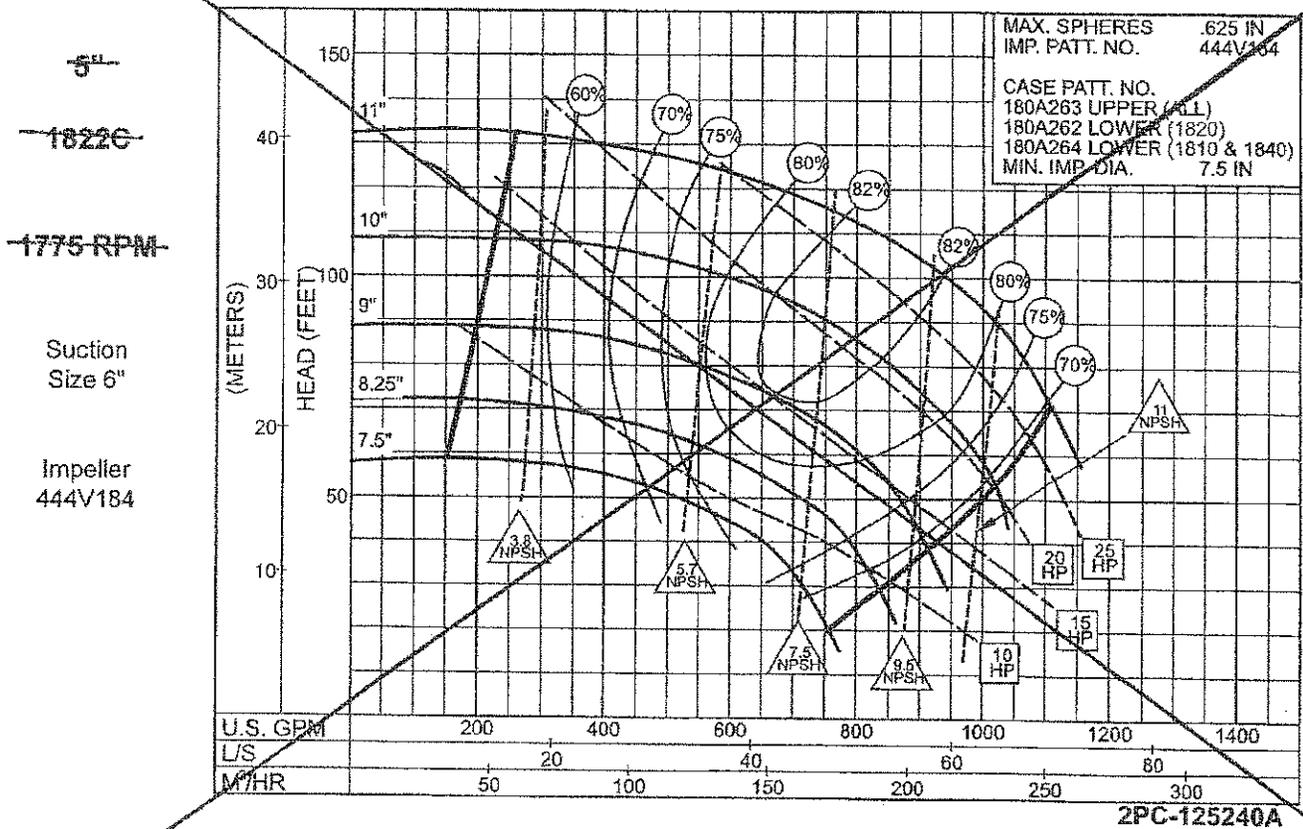
- All dimensions in inches (mm).
- Dimensions may vary $\pm 3/8"$ (10).
- Not for construction purposes unless certified.
- Coupling gap may vary 1/8" (3) to 2-1/16" (52).
- Conduit box is shown in approximate location. Dimensions are not specified as they vary with each motor manufacturer.
- Discharge and suction flanges - ANSI Standard (flat face).

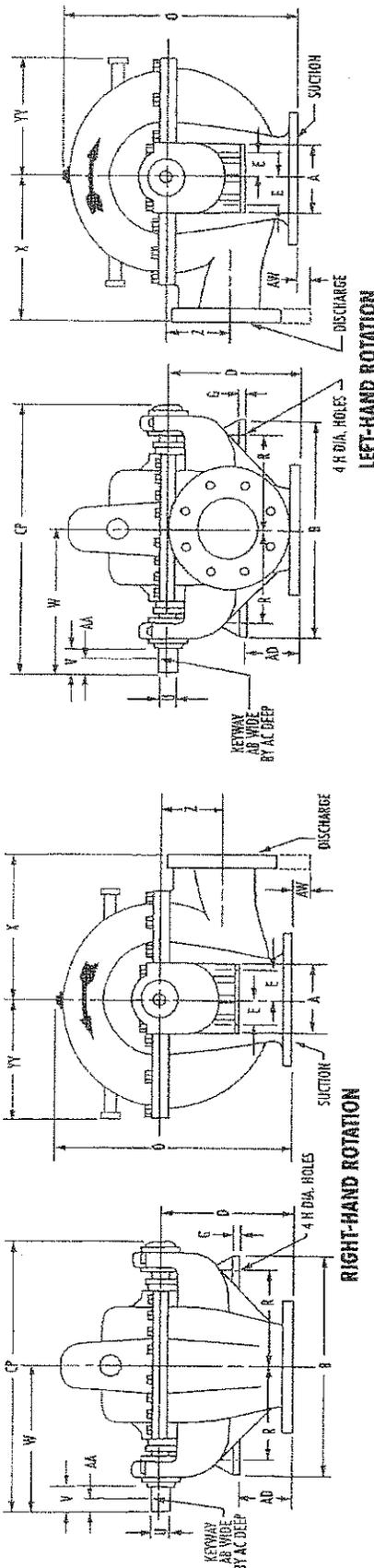
STD. 125# FLANGES	DPL 250# FLANGES
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** Dimension "D" is 10-1/2" (267) when using frames 324TS through 365T.

† Dimension "D" is 10-1/2" (267) when using frames 404TS through 405TS.

‡ Dimension "D" is 11" (279) when using frames 444TS.

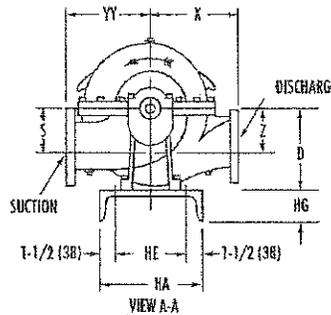
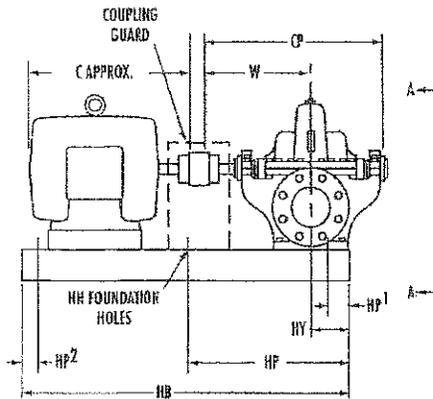




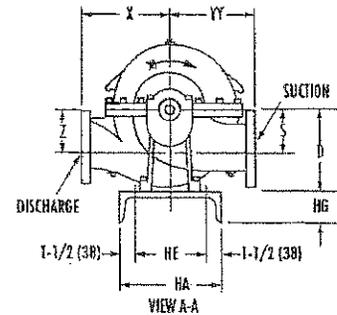
Pump	Disch.	Suction	Power Series	A	B	D	E	G	H	O	R	S	U	V	W	X	Z	AA	AB	AC	AD	AW	AX	CP	YY
2" 1823	2	2-1/2	1	6-1/2 (165)	8 (203)	7 (178)	2-3/4 (70)	5/8 (16)	1/2 (13)	13-3/8 (340)	3-1/4 (86)	3-1/2 (89)	3/4 (19)	3-1/2 (89)	11-3/8 (295)	8-1/2 (216)	3-1/2 (89)	2 (51)	3/16 (5)	3/32 (8)	8-3/8 (213)	-	1/4 (6)	20-1/2 (518)	9
2" 1824	2	2-1/2	1	6-1/2 (165)	8 (203)	7 (178)	2-3/4 (70)	5/8 (16)	1/2 (13)	13-3/8 (340)	3-1/4 (86)	3-1/2 (89)	3/4 (19)	3-1/2 (89)	11-3/8 (295)	8-1/2 (216)	3-1/2 (89)	2 (51)	3/16 (5)	3/32 (8)	8-3/8 (213)	-	1/4 (6)	20-1/2 (518)	9
2" 1825	2	2-1/2	1	6-1/2 (165)	8 (203)	7 (178)	2-3/4 (70)	5/8 (16)	1/2 (13)	13-3/8 (340)	3-1/4 (86)	3-1/2 (89)	3/4 (19)	3-1/2 (89)	11-3/8 (295)	8-1/2 (216)	3-1/2 (89)	2 (51)	3/16 (5)	3/32 (8)	8-3/8 (213)	-	1/4 (6)	20-1/2 (518)	9
2-1/2" 1823	2-1/2	3	2	8 (203)	10 (254)	9 (229)	3-1/2 (89)	3/4 (19)	3/4 (19)	16-1/4 (413)	4 (102)	4 (102)	1-1/8 (29)	3-1/2 (89)	13-1/2 (338)	9-3/4 (248)	4 (102)	2-1/8 (54)	1/4 (6)	1/8 (3)	9-1/2 (231)	-	24 (610)	10	
2-1/2" 1824	2-1/2	3	2	8 (203)	10 (254)	9 (229)	3-1/2 (89)	3/4 (19)	3/4 (19)	16-1/4 (413)	4 (102)	4 (102)	1-1/8 (29)	3-1/2 (89)	13-1/2 (338)	9-3/4 (248)	4 (102)	2-1/8 (54)	1/4 (6)	1/8 (3)	9-1/2 (231)	-	24 (610)	10	
3" 1824	3	4	2	8 (203)	10 (254)	9 (229)	3-1/2 (89)	3/4 (19)	3/4 (19)	16-1/4 (413)	4 (102)	4 (102)	1-1/8 (29)	3-1/2 (89)	13-1/2 (338)	9-3/4 (248)	4 (102)	2-1/8 (54)	1/4 (6)	1/8 (3)	9-1/2 (231)	-	24 (610)	11	
3" 1825	3	4	2	8 (203)	10 (254)	9 (229)	3-1/2 (89)	3/4 (19)	3/4 (19)	16-1/4 (413)	4 (102)	4 (102)	1-1/8 (29)	3-1/2 (89)	13-1/2 (338)	9-3/4 (248)	4 (102)	2-1/8 (54)	1/4 (6)	1/8 (3)	9-1/2 (231)	-	24 (610)	11	
4" 1822	4	5	2	10 (254)	12 (305)	11 (279)	4-1/4 (111)	7/8 (19)	3/4 (19)	18-3/8 (467)	5 (127)	5 (127)	1-3/8 (33)	4-1/2 (111)	14-1/2 (366)	10 (254)	5 (127)	2-3/8 (60)	3/8 (10)	1/2 (3)	11 (279)	-	26 (660)	12	
4" 1823C	4	5	3	10 (254)	12 (305)	11 (279)	4-1/4 (111)	7/8 (19)	3/4 (19)	18-3/8 (467)	5 (127)	5 (127)	1-3/8 (33)	4-1/2 (111)	14-1/2 (366)	10 (254)	5 (127)	2-3/8 (60)	3/8 (10)	1/2 (3)	11 (279)	-	26 (660)	12	
4" 1823D	4	5	3	10 (254)	12 (305)	11 (279)	4-1/4 (111)	7/8 (19)	3/4 (19)	18-3/8 (467)	5 (127)	5 (127)	1-3/8 (33)	4-1/2 (111)	14-1/2 (366)	10 (254)	5 (127)	2-3/8 (60)	3/8 (10)	1/2 (3)	11 (279)	-	26 (660)	12	
4" 1824	4	5	3	10 (254)	12 (305)	11 (279)	4-1/4 (111)	7/8 (19)	3/4 (19)	18-3/8 (467)	5 (127)	5 (127)	1-3/8 (33)	4-1/2 (111)	14-1/2 (366)	10 (254)	5 (127)	2-3/8 (60)	3/8 (10)	1/2 (3)	11 (279)	-	26 (660)	12	
4" 1825	4	6	4	10 (254)	12 (305)	11 (279)	4-1/4 (111)	7/8 (19)	3/4 (19)	18-3/8 (467)	5 (127)	5 (127)	1-3/8 (33)	4-1/2 (111)	14-1/2 (366)	10 (254)	5 (127)	2-3/8 (60)	3/8 (10)	1/2 (3)	11 (279)	-	26 (660)	12	
5" 1822	5	6	4	12 (305)	14 (356)	13 (311)	5-1/4 (138)	1 (25)	3/4 (19)	20-1/4 (513)	6 (152)	6 (152)	1-7/8 (45)	5-1/2 (138)	16 (406)	11 (279)	6 (152)	3-1/2 (89)	1/2 (3)	1/8 (3)	12 (305)	-	28 (714)	13	
5" 1823	5	6	4	12 (305)	14 (356)	13 (311)	5-1/4 (138)	1 (25)	3/4 (19)	20-1/4 (513)	6 (152)	6 (152)	1-7/8 (45)	5-1/2 (138)	16 (406)	11 (279)	6 (152)	3-1/2 (89)	1/2 (3)	1/8 (3)	12 (305)	-	28 (714)	13	
5" 1824	5	6	4	12 (305)	14 (356)	13 (311)	5-1/4 (138)	1 (25)	3/4 (19)	20-1/4 (513)	6 (152)	6 (152)	1-7/8 (45)	5-1/2 (138)	16 (406)	11 (279)	6 (152)	3-1/2 (89)	1/2 (3)	1/8 (3)	12 (305)	-	28 (714)	13	
6" 1822	6	8	4	14 (356)	16 (406)	15 (381)	6-1/4 (161)	1 (25)	3/4 (19)	22-1/4 (565)	7 (178)	7 (178)	1-7/8 (45)	6-1/4 (161)	18 (457)	12 (305)	7 (178)	4 (102)	1/2 (3)	1/8 (3)	13 (330)	-	30 (762)	14	
6" 1822RH	6	8	4A	14 (356)	16 (406)	15 (381)	6-1/4 (161)	1 (25)	3/4 (19)	22-1/4 (565)	7 (178)	7 (178)	1-7/8 (45)	6-1/4 (161)	18 (457)	12 (305)	7 (178)	4 (102)	1/2 (3)	1/8 (3)	13 (330)	-	30 (762)	14	
8" 1821	8	8	4	18 (457)	20 (508)	19 (483)	8-1/4 (211)	1 (25)	3/4 (19)	26-1/4 (665)	8 (203)	8 (203)	1-7/8 (45)	8-1/4 (211)	22 (559)	14 (356)	8 (203)	4 (102)	1/2 (3)	1/8 (3)	15 (381)	-	32 (813)	15	

NOTES:
 1. All dimensions in inches (mm).
 2. Dimensions may vary ± 3/64" (10).
 3. Not for construction purposes unless certified.
 4. Discharge end suction flanges - ANSI Standard flat face.





RIGHT-HAND ROTATION



LEFT-HAND ROTATION

STANDARD STEEL BASE

PUMP SIZE			POWER SERIES	D	S	W	X	Z	CP	HY	YY	
DISCH.	SUCT.	CASE BORE										
4	6	18B	4	12-1/2 (318)	6-1/4 (159)	16 (406)	14 (356)	6-1/4 (159)	28-1/2 (724)	6 (152)	18 (406)	
5	6	11A & C		11** (279**)	5-1/2 (140)		11-1/4 (286)	5-1/2 (140)			13-1/4 (337)	13-1/4 (337)
5	6	15		12-1/2 (318)	6-1/4 (159)		13-1/4 (337)	6-1/4 (159)			15 (381)	15 (381)
5	6	17		12-1/2 (318)	6-1/4 (159)		14 (356)	6-1/4 (159)			15 (381)	15 (381)
6	8	11		12-1/2 (318)	6-1/4 (159)		11-3/4 (286)	6-1/4 (159)			14-1/2 (368)	14-1/2 (368)
6	8	11B		12-1/2 (318)	6-1/4 (159)		12 (305)	6-1/4 (159)			14-1/2 (368)	14-1/2 (368)
6	8	11HH	4A	14-1/2 (419)	8-5/8 (219)	18-1/8 (461)	10 (254)	8-5/8 (219)	32-3/4 (832)	7 (178)	17 (432)	
6	8	14HH	5A	14-1/2 (419)	7-1/2 (191)	20-7/16 (519)	15 (381)	7-1/2 (191)	36-3/4 (933)	7 (178)	17 (432)	
6	8	15	5	13-1/2 (343)	6-3/4 (171)	18 (457)	14-1/4 (362)	6-3/4 (171)	32 (813)	7 (178)	16-3/4 (425)	
6	8	18A, B & C		14-3/4 (375)	8 (203)		16 (406)	8 (203)			18 (457)	18 (457)
6	8	20		14-3/4 (375)	8 (203)		15-3/4 (406)	8 (203)			18 (457)	18 (457)
8	10	12 & 12A		14-3/4 (375)	8 (203)		17 (432)	9 (229)			17-3/4 (451)	17-3/4 (451)
8	10	15A & B		14-3/4 (375)	8 (203)		17 (432)	9 (229)			17-3/4 (451)	17-3/4 (451)
8	10	17B		14-3/4 (375)	8 (203)		17 (432)	8 (203)			17-3/4 (451)	17-3/4 (451)

BASE	SIZE	HA	HB	HE	HG	BHP				
						QTY	SIZE	HP	HP1	HP2
5	12 x 38	12 (305)	38 (965)	9 (229)	3 (76)	4	5/8 (16)	20 (508)	-	-
7	13 x 42	13 (330)	42 (1067)	10 (254)	4 (102)	4	-	24 (610)	-	-
9	15 x 44	15 (381)	44 (1118)	12 (305)	3-3/8 (86)	4	-	24 (610)	-	-
10	18 x 44	18 (457)	44 (1118)	15 (381)	4 (102)	4	-	-	-	-
11	18 x 48	18 (457)	48 (1219)	15 (381)	4 (102)	4	-	-	1 (25)	-
12	18 x 54	18 (457)	54 (1372)	15 (381)	4 (102)	4	-	-	-	1 (25)
13	18 x 60	18 (457)	60 (1524)	15 (381)	4 (102)	4	-	24 (610)	-	-
14	18 x 65	18 (457)	65 (1651)	15 (381)	4 (102)	4	-	24 (610)	-	-
15	22 x 60	22 (559)	60 (1524)	19 (483)	4 (102)	4	-	-	-	-
16	22 x 72	22 (559)	72 (1829)	19 (483)	4 (102)	4	-	-	1 (25)	-
17	22 x 84	22 (559)	84 (2134)	19 (483)	4 (102)	4	-	-	-	-

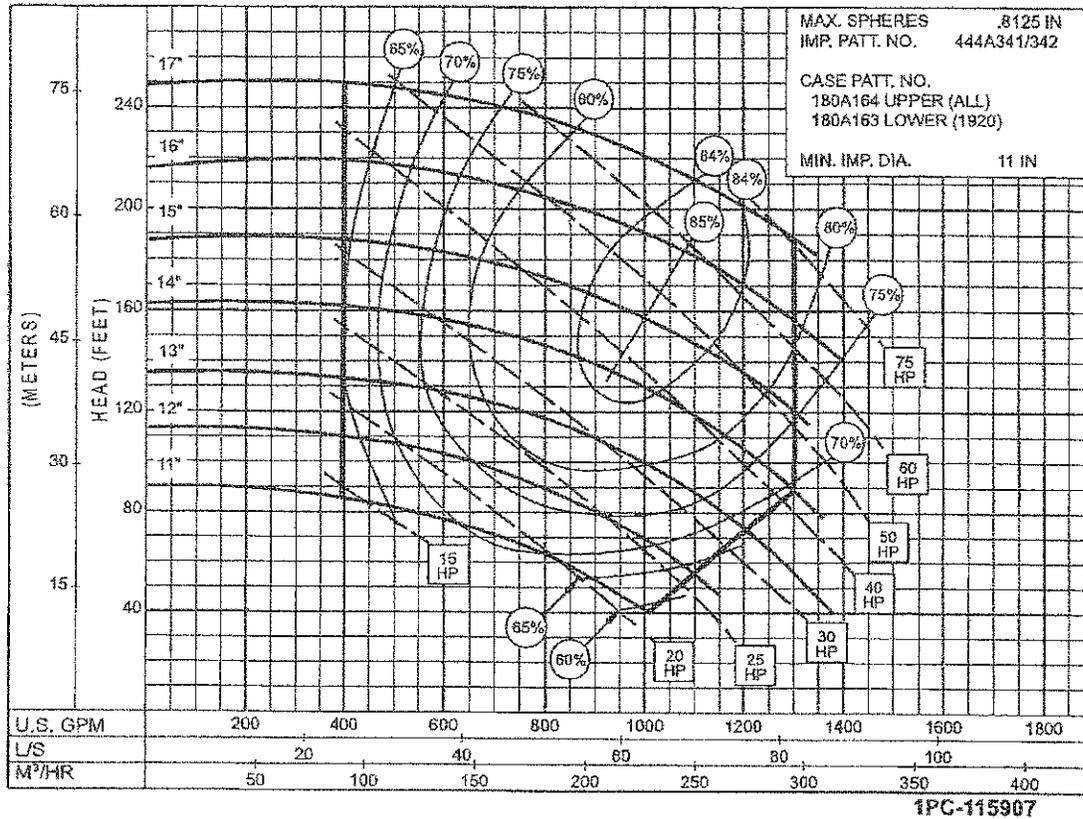
PUMP SIZE	FRAME	213T	215T	254T	256T	284TS	284T	286TS	286T	324TS	324T	326TS	326T	364TS	364T	365TS	365T	404TS	404T	405TS	405T	444TS	444T	445TS	445T	447TS	447T	449TS	449T
		C	16 (406)	18 (457)	21 (533)	23 (584)	22 (559)	24 (610)	24 (610)	25 (635)	25 (635)	26 (660)	26 (660)	28 (711)	28 (711)	29 (737)	29 (737)	30 (762)	30 (762)	33 (838)	33 (838)	31 (787)	35 (889)	34 (864)	36 (914)	36 (914)	40 (994)	40 (994)	44 (1118)
4" 1825B	BASE																												
5" 1822ABC	BASE																												
5" 1823	BASE	5	7	9	10																								
5" 1824	BASE																												
6" 1822	BASE																												
8" 1821B	BASE																												
6" 1822HH	BASE																												
6" 1823RH	BASE																												
6" 1823	BASE	-	-																										
6" 1824ABC	BASE	-	-																										
6" 1825	BASE	-	-																										
8" 1822 & 8" 1822A	BASE	-	-	10	11																								
8" 1823A&B	BASE	-	-																										
8" 1824B	BASE	-	-																										

NOTES:

- All dimensions in inches (mm).
- Dimensions may vary ± 3/8" (10).
- Not for construction purposes unless certified.
- Coupling gap may vary 1/8" (3) to 2-1/16" (52).
- Conduit box is shown in approximate location. Dimensions are not specified as they vary with each motor manufacturer.
- Discharge and suction flanges - ANSI Standard flat face.

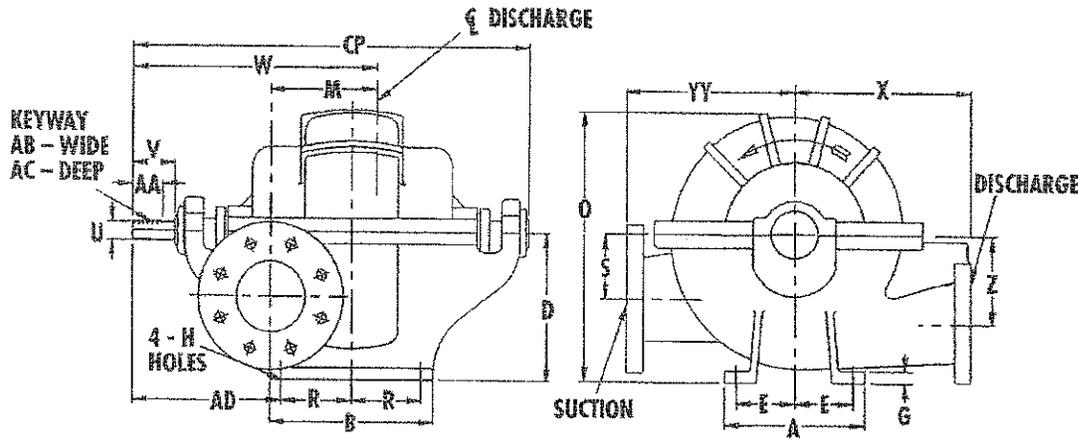
- ** Dimension "D" is 12" (305) when using frames 404TS through 449T.
- † Dimension "D" is 14-1/2" (368) when using frames 404TS through 449T.

STD. 125# FLANGES	OPT. 250# FLANGES
-------------------	-------------------



6"
 1922B
 1150 RPM
 Impeller
 444A341/342

THIS SECTION LEFT BLANK INTENTIONALLY



RIGHT-HAND PUMP DIMENSIONS

Model	Pump Size			Power Series	A	B	D	E	G	H	M	O	R	S	U	V	W	X	Z	AA	AB	AC	AD	CP	YY	
	Disch.	Suction	Case Bore																							
2" 1923A/ 2" 1923B	2	2-1/2	12	2	8 (203)	10 (254)	9 (229)	3-1/2 (89)	3/4 (19)	5/8 (16)	4-3/4 (121)	19 (483)	4 (102)	4 (102)	1-1/8 (29)	2-3/4 (70)	15-3/4 (400)	10 (254)	5-1/2 (140)	2 (51)	1/4 (6)	1/8 (3)	10-1/2 (268)	26-1/4 (667)	10-1/4 (260)	
2-1/2" 1922A	2-1/2	3	12	2	8 (203)	10 (254)	9 (229)	3-1/2 (89)	3/4 (19)	5/8 (16)	5-3/8 (137)	19 (483)	4 (102)	4 (102)	1-1/8 (29)	2-3/4 (70)	15-7/8 (403)	11 (279)	5-1/2 (140)	2 (51)	1/4 (6)	1/8 (3)	10-1/2 (268)	26-1/4 (667)	11 (279)	
3" 1923A/ 3" 1923B	3	4	14	3	10 (254)	12 (305)	10 (254)	4-1/4 (108)	7/8 (22)	3/4 (19)	6-3/4 (171)	21 (533)	5 (127)	5 (127)	4-1/2 (114)	1-3/8 (35)	3 (76)	18-3/4 (476)	12 (305)	6 (152)	2 (51)	3/8 (10)	3/16 (5)	12 (305)	31 (787)	12-3/8 (314)
4" 1922	4	5	15	3	10 (254)	12 (305)	11 (279)	4-1/4 (108)	7/8 (22)	3/4 (19)	7-1/8 (181)	23 (584)	5 (127)	5 (127)	1-3/8 (35)	3 (76)	18-7/8 (479)	13 (330)	6-1/2 (165)	2 (51)	3/8 (10)	3/16 (5)	12 (305)	31 (787)	13-1/2 (343)	
5" 1924	5	5	12	4A	15 (381)	16 (406)	14 (356)	6-1/2 (165)	1 (25)	7/8 (22)	6-5/8 (168)	24-1/4 (616)	7 (178)	7 (178)	1-1/2 (38)	3-5/8 (92)	20-7/8 (530)	13 (330)	7 (178)	2-1/2 (64)	3/8 (10)	3/16 (5)	12-1/2 (318)	35-3/8 (899)	13 (330)	
5" 1922	5	6	15	4	12 (305)	14 (356)	12-1/2 (318)	5 (127)	1 (25)	7/8 (22)	9-1/8 (232)	24-1/2 (622)	6 (152)	5-1/2 (140)	1-1/2 (38)	3-1/2 (89)	21-1/8 (537)	15 (381)	7-1/2 (191)	2 (51)	3/8 (10)	3/16 (5)	13 (330)	34-1/2 (876)	15-7/16 (392)	
6" 1924	6	6	12	5A	16 (406)	19 (483)	15 (381)	7 (178)	1 (25)	7/8 (22)	7-1/2 (191)	26-1/4 (667)	8-1/2 (216)	8 (203)	1-3/4 (44)	4 (102)	22-7/8 (581)	14 (356)	8 (203)	2-3/4 (70)	3/8 (10)	3/16 (5)	12-3/4 (324)	38-1/2 (978)	14 (356)	
6" 1922A/ 6" 1922B	6	8	17	5	12 (305)	14 (356)	14-3/4 (375)	5 (127)	1 (25)	7/8 (22)	11 (279)	28-1/4 (718)	6 (152)	7 (178)	1-3/4 (44)	4 (102)	24-1/2 (622)	16 (406)	9 (229)	2-7/8 (73)	3/8 (10)	3/16 (5)	15 (381)	38 (965)	16-1/2 (419)	
6" 1923A/ 6" 1923B	6	8	16/168	5	12 (305)	14 (356)	16-1/2 (419)	5 (127)	1 (25)	7/8 (22)	10-1/2 (267)	33-1/2 (851)	6 (152)	8-1/4 (210)	1-3/4 (44)	4 (102)	23-5/8 (600)	19 (483)	7-3/4 (197)	2-7/8 (73)	3/8 (10)	3/16 (5)	15 (381)	37-7/8 (962)	17 (432)	

NOTES

- All dimensions are in inches (mm).
- Dimensions may vary ±3/8" (10).
- Not for construction purposes unless certified.
- Suction & discharge flanges - American Standard flat face.
- *5" 1924 and 6" 1924 standard 150# suction flanges & 300# discharge flanges.
- 15" 1924 and 6" 1924 opt. 300# flanges.

STD. 125# SUCTION FLANGES & 250# DISCHARGE FLANGES*	OPT. 250# FLANGES†
--	-----------------------



MITCHELL LEWIS & STAVAR CO.
 MITCHELL LEWIS & STAVAR CO.
 5525 W LATHAM STREET #11
 PHOENIX, AZ 85043
 Phone: 602-233-0441 FAX: 602-233-0036

Website: www.mitchellewis.com

QUOTE

Customer Copy	
Number	029867
Date	05/16/12
Page	1

Ship To: 12620	CARLSON ELECTRIC 3093 SUNSET LANE LAKESIDE, AZ 85929	Bill To: SAME	CARLSON ELECTRIC 3093 SUNSET LANE LAKESIDE, AZ 85929
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Reference #	Expires	Slip	Terms	Wh	Freight	Ship Via
100HP HOLBROOK	06/16/12	150 JGS	2%10TH N30TH CO	A1	PPA	BEST WAY
Quoted By: JGS	Quoted To:	SKIP CARLSON				

Item	Description	Ordered	UM	Price	UM	Extension
B62094SMS1	BERKELEY BSEPBMS 100HP 460V 5X6 CENT PREM EFF ODP MOTOR TRIM TO 8.19" 1200GPM @ 200"	1	EA		EA	
100HP SS PANEL	100HP SOFT START PANEL 3R 48" X 30" X 16" WALL MOUNT	1	EA		EA	
100HP VFD PANEL	100HP VFD PANEL 3R FLOOR MOUNT 48" X 30" X 16"	1	EA		EA	
	STRIKE SORB SURGE PROTECTION. ADD FRT					
	APPROX 5-6 WEEKS FOR PUMP MOTOR, 3-4 WEEKS FOR PANELS ADD FRT					

Merchandise	Tax	Freight	Total
	.00	.00	



QUOTATION # 12PH8747

05.16.12

TO: Carlson Electric
 ATTN: Skip Carlson
 PHONE:

PROJECT: TBA
 PAGES: 1
 FAX:

QTY	DESCRIPTION	AMOUNT
<p>Engineered Solutions is pleased to offer the following proposal:</p>		
<p>100HP, 480V, 3Ø, 3R Heavy Duty electric Soft Start control panel, <u>with a maximum continuous output current rating of 210A.</u> The panel will come pre-assembled and include:</p>		
<ul style="list-style-type: none"> • 48" x 30" x 16" NEMA 3R wall mount enclosure • 400A main circuit breaker with door mounted operator • Motortronics VMX-210-BP electronic soft starter with pump soft stop, low current cut-out, fault log, electronic motor protection, • Auxillary integrated Thermal Overload for emergency across-the-line rated bypass capability • A-t-L Phase Loss Monitor • Door mounted display/programmer with cover • Door mounted Hand-Off-Auto three way selector switch with Run light • Door mounted SS-Prgm-ByPass three way selector switch • 480/120V fused step-down transformer • Humidistat & strip heater • UL 508A Listed & Service entrance rated (10kA SCCR) 		
<p>YOUR PRICE FOR THE ABOVE EQUIPMENT IS:</p>		
<p>100HP, 460V, 3Ø, Nema 3R variable frequency drive (VFD) control panel, <u>with a maximum continuous current rating of 130A.</u> The Motor Control Panel will come pre-assembled, programmed for your application, tested and include:</p>		
<ul style="list-style-type: none"> • 48" x 30" x 16" NEMA 3R floor mounted enclosure • 200A Main fused disconnect with external operator • Danfoss FC202 (100HP) Variable Frequency Drive • Door mounted remote display/programmer with cover • 460/120V step down transformer • 0-150 PSI pressure transducer with 25' instrument cable • Filtered Fan Ventilation • UL 508A listed & Service Entrance Rated 		
<p>YOUR PRICE FOR THE ABOVE EQUIPMENT IS:</p>		
<p>To include integrated <u>Strike Sorb</u> surge protection device (SPD), ADD</p>		
<p style="text-align: center;">Above Quote Valid For 30 Days</p>		

FOB
 CARRIER
 PREPARED BY
 PHONE
 FAX

Wilsonville, OR
 MLS Choice
 EP
 503-682-1800
 503-682-0719

EST.TOTAL WGT
 DELIVERY
 SALESMAN
 PHONE
 FAX

TBD
 Approx. 3-4 weeks
 John Stallbaumer
 602-233-0441
 602-233-0036

MITCHELL LEWIS & STAVER
WILSONVILLE BRANCH
 9935 SW Commerce Circle • Wilsonville, OR 97070
 Tel: (503) 682-1800 • Fax: (503) 682-0719



Pump Performance Datasheet

Customer	:	Quote number	:
Customer reference	:	Size	: 5 x 6 x 10 BM (B5EPBM)
Item number	:	Stages	: 1
Service	:	Based on curve number	: 8726
Quantity	: 1	Date last saved	: 16 May 2012 1:50 PM

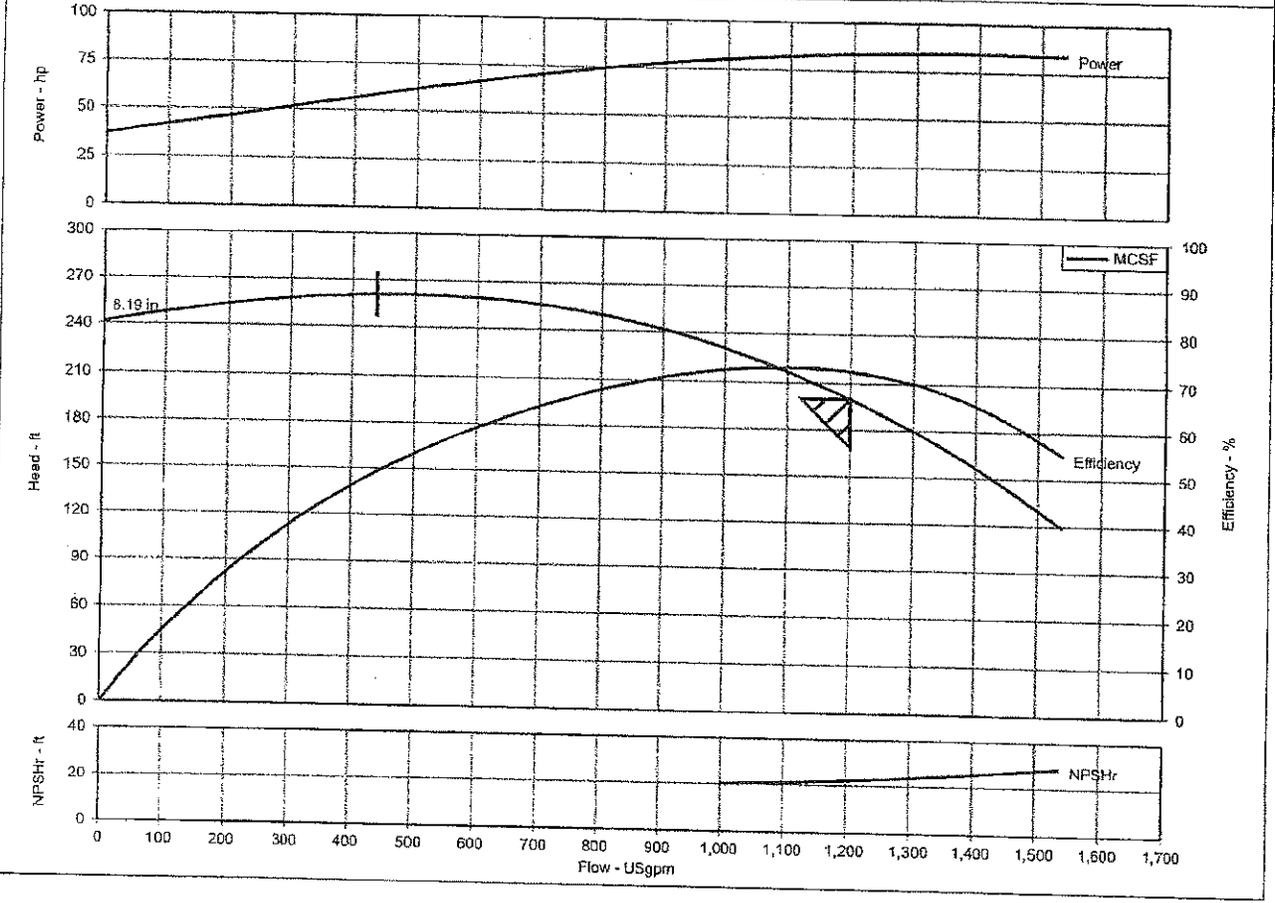
Operating Conditions		Liquid	
Flow, rated	: 1,200.0 USgpm	Liquid type	: --Water
Differential head / pressure, rated (requested)	: 200.0 ft	Additional liquid description	:
Differential head / pressure, rated (actual)	: 200.3 ft	Solids diameter, max	: 0.00 in
Suction pressure, rated / max	: 0.00 / 0.00 psi.g	Solids concentration, by volume	: 0.00 %
NPSH available, rated	: Ample	Temperature, max	: 68.00 deg F
Frequency	: 60 Hz	Fluid density, rated / max	: 1.000 / 1.000 SG
		Viscosity, rated	: 1.00 cP
		Vapor pressure, rated	: 0.00 psi.a

Performance	
Speed, rated	: 3,550 rpm
Impeller diameter, rated	: 8.19 in
Impeller diameter, maximum	: 9.88 in
Impeller diameter, minimum	: 7.56 in
Efficiency	: 72.48 %
NPSH required / margin required	: 22.31 / 0.00 ft
nq (imp. eye flow) / S (imp. eye flow)	: 33 / 220 Metric units
MCSF	: 440.0 USgpm
Head, maximum, rated diameter	: 260.8 ft
Head rise to shutoff	: 20.67 %
Flow, best eff. point (BEP)	: 1,101.1 USgpm
Flow ratio (rated / BEP)	: 108.98 %
Diameter ratio (rated / max)	: 82.91 %
Head ratio (rated dia / max dia)	: 53.77 %
Cq/Ch/Ce [ANSI/HI 9.6.7-2004]	: 1.00 / 1.00 / 1.00
Selection status	: Acceptable

Material	
Material selected	: Not specified

Pressure Data	
Maximum working pressure	: 112.9 psi.g
Maximum allowable working pressure	: 270.0 psi.g
Maximum allowable suction pressure	: N/A
Hydrostatic test pressure	: N/A

Driver & Power Data	
Driver sizing specification	: Rated power
Margin over specification	: 0.00 %
Service factor	: 1.00
Power, hydraulic	: 60.61 hp
Power, rated	: 83.62 hp
Power, maximum, rated diameter	: 84.60 hp
Minimum recommended motor rating	: 100 hp / 74.57 kW

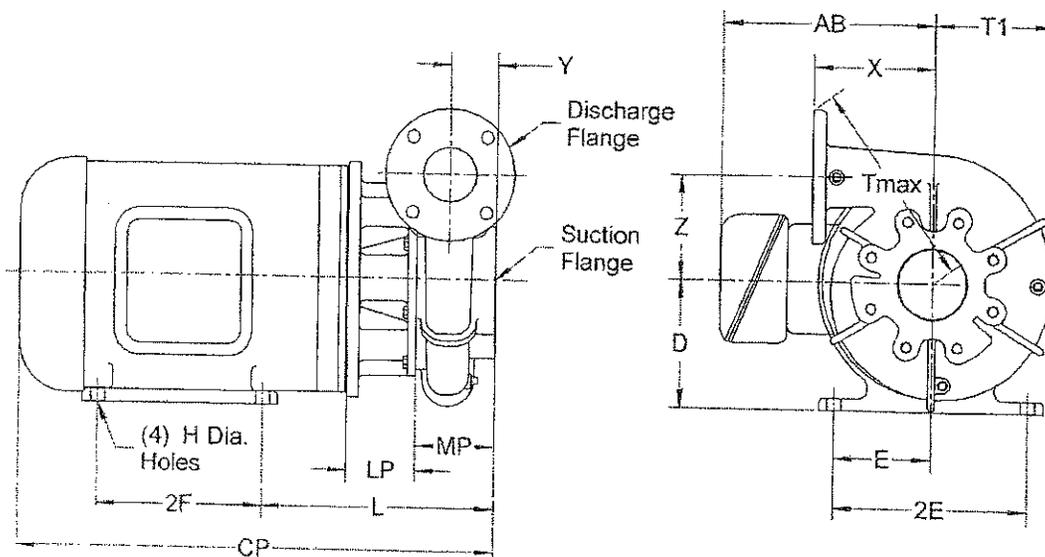




Berkeley Dimensional Drawing

Date	Job/Ref.
5/16/12	

Model	Fittings	HP	RPM	Phase	Encl.	Frame Size
B5EPBMS	FLG	100	3600	3	ODP	365JP

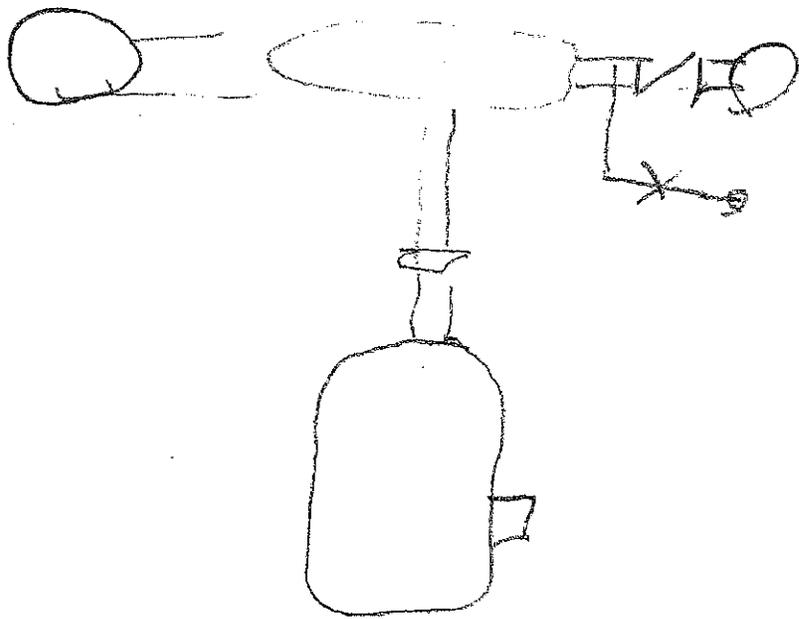
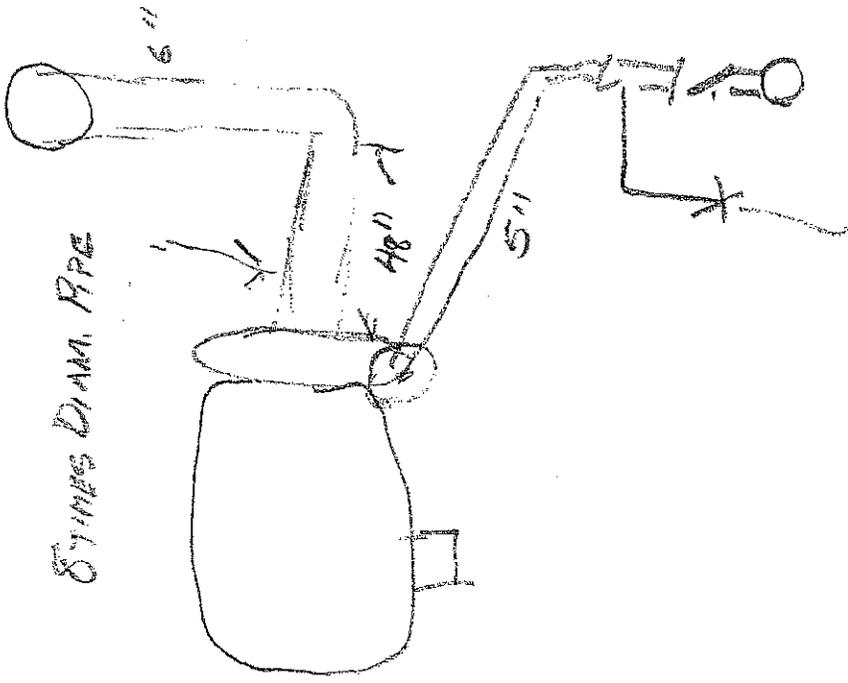


Note: Dimensions in inches. Drawing is typical and NOT to scale.

AB	CP	D	E	2E	2F	H	L	LP	MP	T1	Tmax	X	Y	Z	Suct	Disch
16.38	36.84	9.00	7.00	14.00	12.25	0.66	18.96	6.25	6.56	8.26	15.26	9.50	3.94	6.94	6	4 3/4

Sta-Rite Industries, Inc. makes no representations or warranties, express or implied, as to the accuracy of any of information provided hereunder. Consequently, Sta-Rite Industries will have no liability arising out of the receipt or use of any such information.

Notes



Randy Sullivan

From: David Donovan [ddonovan@pumpsystemsaz.com]
Sent: Wednesday, May 16, 2012 8:36 AM
To: Randy Sullivan
Cc: Kevin Oliver
Subject: Water Booster Pump Replacement
Attachments: Q8895.PDF

Randy

Attached is our quotation for the supply of the two domestic booster pumps along with the requested literature. Please note our pumps can be installed with minor field and piping changes. We feel the work can be completed by City personnel without problems. If you have any questions or need additional information please feel free to give Kevin or myself a call.

David Donovan
480-545-8484 Phone
480-545-8787 Fax
ddonovan@pumpsystemsaz.com



PUMP SYSTEMS, INC.

55 N. Sunway Dr.
 Gilbert, AZ 85233
 Phone 480-545-8484 • Fax 480-545-8787

QUOTATION

Quote No:
 Quote Date:
 Account:

Page 1
 CUSTOMER

QUOTE FOR:
 CITY OF HOLBROOK
 P O BOX 970
 HOLBROOK, AZ 86025

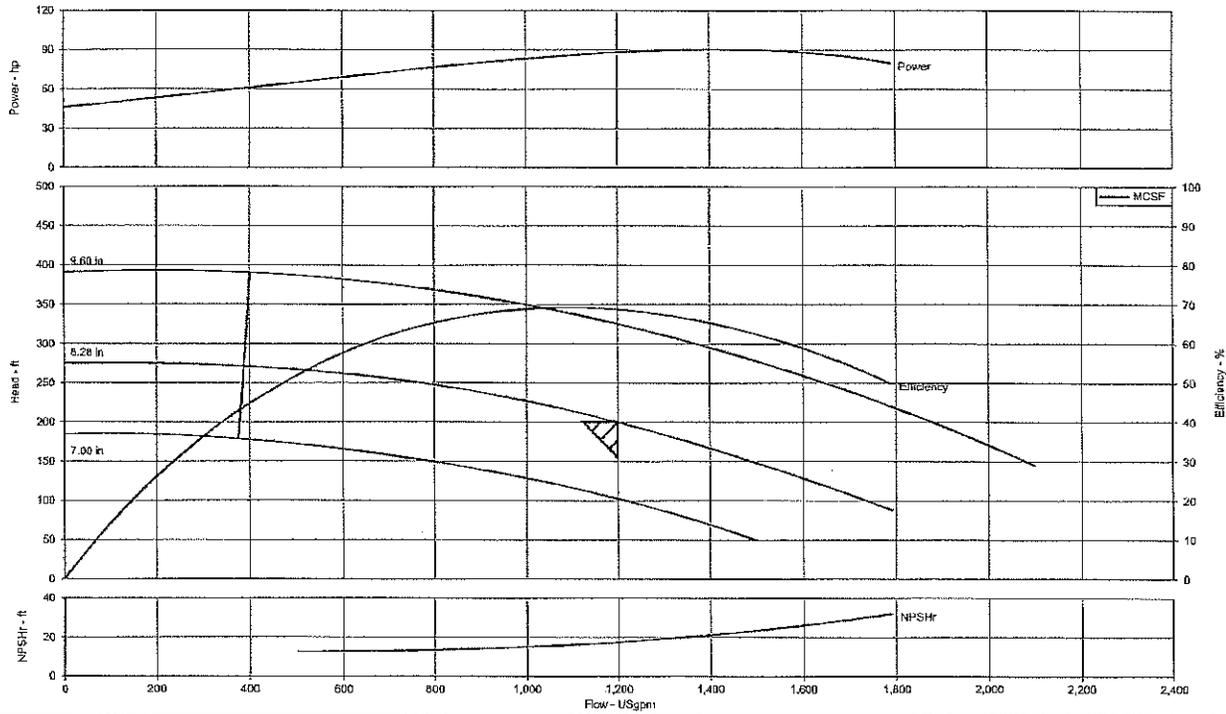
SHIP TO:
 CITY OF HOLBROOK
 465 FIRST AVE.
 HOLBROOK, AZ 86025

REP	INQUIRY NUMBER	REFERENCE	SHIP VIA	DELIVERY	SHIP FOB
002			TRUCK FFA	7/27/12	SHIPPING POINT

QTY	UM	ITEM NO	DESCRIPTION	UNIT PRICE	D%	EXT PRICE	
2.00	EA	16-50959-1A0101-1931	PACO BOOSTER PUMPS 5" X 5" VERTICAL IN-LINE PUMP. CAST IRON BRONZE FITTED WITH A MECHANICAL SEAL. DRIVEN BY A 100 HP, 3500 RPM, 460V/3/60, ODP, PREMIUM EFFICIENCY, ELECTRIC MOTOR. RATED FOR 1200 GPM @ 200' TDH. 8.28" IMPELLER DIAMETER.	9,725.000		19,450.00	
2.00	EA	PA 20336601C	CAST IRON PUMP STAND TO BE MOUNTED ON ABOVE PUMP.	204.000		408.00	
NOTES:			1. DELIVERY =7-8 WEEKS 2. UNIT WEIGHT = 867 LBS. EACH 3. LITERATURE ATTACHED FOR YOUR REVIEW.				
BUYER: RANDY SULLIVAN PHONE: (602) 524-6225 EXT				QUOTED BY: DAVID DONOVAN QUOTED EXPIRES: 6/16/2012 PAYMENT TERMS: NET 20 DAYS		SUBTOTAL	19,858.00
						SALES TAX	1,747.50
						FREIGHT	0.00
						TOTAL QUOTE	21,605.50



Pump Performance Curve



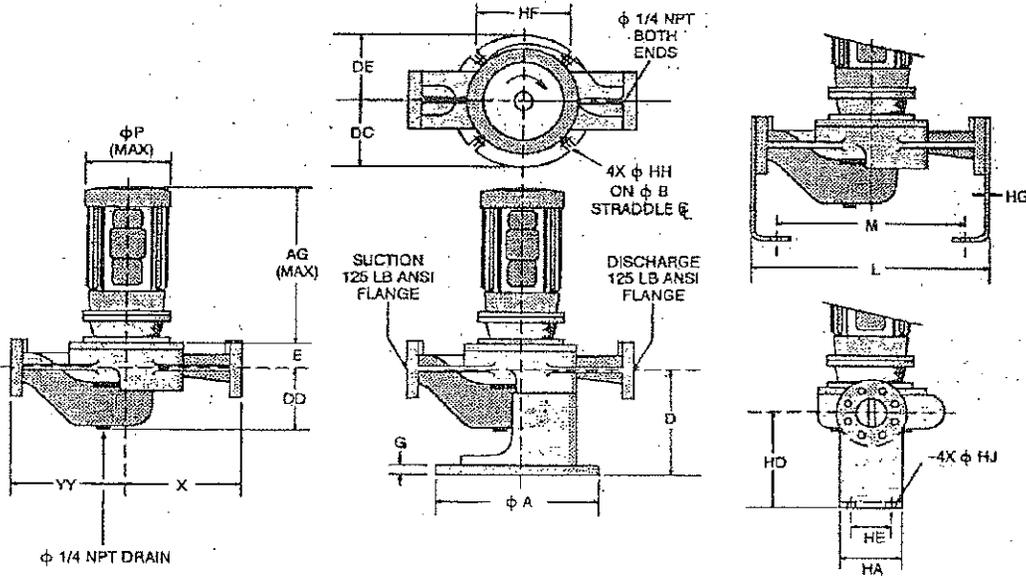
Project name / location : Default	Tag Number : 001	Speed, rated : 3,550 rpm
Consulting engineer :	Service :	Flow, rated : 1,200.0 USgpm
Customer :	PACO Model : 50959 VL	Differential head / pressure, rated : 200.0 ft
Customer ref. / PO :	Quantity : 1	Power, rated : 88.19 hp
Quote number : 222563	Quoted By (Sales Office) : Pump Systems, Inc.	Power, maximum, rated diameter : 90.36 hp
Date last saved : 05/16/2012 5:57 AM	Quoted By (Sales Engineer) : David Donovan	Efficiency : 68.70 %
:	Stages : 1	Based on curve number : RC2553 Rev 1



Construction Datasheet

Project name / location : City of Holbrook		Tag Number : 001	
Consulting engineer : -		Service : -	
Customer :		PACO Model : 50959 VL	
Customer ref. / PO :		Quantity : 1	
Quote number : 222563		Quoted By (Sales Office) : Pump Systems, Inc.	
Date last saved : 05/16/2012 5:57 AM		Quoted By (Sales Engineer) : David Donovan	
NOZZLE CONFIGURATION		MANUFACTURER	
Nozzle	Size (in.)	Nozzle Configuration	Pos'n
Suction	5	125# ANSI	Side
Discharge	5	125# ANSI	Side
Orientation / Configuration : Vertical		Manufacturer : Mfg's Choice	
Rotation : Clockwise		Frame Size : 365JPZ	
Wear Ring Configuration : Single - Case		Power : 100 hp	
Discharge Elbow Size : -		RPM : 3,600 rpm	
Subplate : -		Enclosure : ODP	
Sump Depth (feet) : -		Operating Power Supply : 230/460/3/60	
Bearing Frame : -		Efficiency : Premium	
Bearing Frame Foot : -		Service factor : 1.15	
Bearing Type (Radial/Thrust) : In motor		Motor Application : General Purpose	
Bearing Lubrication : Regreasable		Motor Options/Accessories : -	
Thrust Bearing : -		Cord Length (feet) : -	
Intermediate Bearing : -		MATERIALS	
Lower Bearing : -		Case : Cast Iron, ASTM A48 - Class 35	
Bearing Housing Accessories : -		Motor Bracket : Cast Iron, ASTM-A48, CL 30	
PACO Construction code : 16-50959-1A0101-1931		Impeller : Silicon Bronze, ASTM B584 C87600 B21	
BASEPLATE		Impeller Cap Screw and Washer : Stainless Steel, AISI-303	
Baseplate	: Pump stand		
Drip Pan	: -		
Coupling	: -		
Guard	: OSHA Approved		
SEALING METHOD		Impeller Key : Steel, Cold Drawn C1018	
Sealing Method	: Single Seal, Type 21S		
Seal Material	: Buna Carbon Ceramic SS-Spring and Hardware		
Packing Gland	: -		
Lantern Ring	: -		
Recirculation Lines	: Nylon Tubing with Brass Fittings		
WEIGHTS		Case wear ring : Tin Bronze, ASTM B584-90500	
Pump	: 817.0 lb		
Baseplate	: 50.00 lb		
Driver	: 578.0 lb		
Estimated Shipping gross weight	: 817.0 lb		
		Impeller wear ring : -	
		Pump Shaft : Steel, AISI-1040	
		Sleeve : Bronze, III932, C89835	
		Line Shaft : -	
		Column : -	
		Discharge Pipe : -	
		Discharge Elbow : -	
		Suction Elbow : -	
		Subplate : -	
		Hardware : Steel, Grade 5	
		O Rings : Buna N	
		Pump Coatings : Standard Manufacturers Paint	

IN-LINE WITH SUPPORT STAND & WITH FLANGE SUPPORTS — MODELS 4070-7 THRU 5095-9



PUMP DIMENSIONS

Pump Model	Suct. Disch.	A	B	D	E	G	L	M	DC (1)	DD (1)	DE (1)
4070-7	4	12	11	8-11/16	2	3/4	21	16	5-1/8	6-11/16	7-3/8
4095-7	4	16	13-1/2	8-3/4	2-1/8		25-1/2	20-1/2	6-5/8	6-3/4	8-7/8
4012-1, -7	4	16	13-1/2	8-3/4	2		27	20	7-3/4	6-3/4	9-3/4
5070-7	5	12	11	10-1/8	2-1/8		24	19	6-1/8	7-3/4	8-5/8
5095-7, -9	5	16	13-1/2	9-3/4	2-1/4		27	22	7-1/8	7-1/8	9-1/2

(cont.)

Pump Model	HA	HD	HE	HF	HG	HH (2)	HJ	X	YY
4070-7	6	8	4	7-13/16	1/2	3/4	3/4	10	10
4095-5	6	8	4	9-9/16	1/2		3/4	12	12-1/2
4012-1, -7	6	8	4	9-9/16	1/2		3/4	13	13
5070-7	7	10	5	7-13/16	1/2		7/8	11-1/2	11-1/2
5095-7, -9	7	10	5	9-9/16	1/2		7/8	13	13

MOTOR DIMENSIONS

	X3 CONST.				X4/XA CONST.				X5 CONST.		
	143TC/ 145JM	182TC/ 184JM	213TC/ 215JM	254 TC/JM	213TC/ 215JM	254TC/ 255JM	284TC/ 286JM	324TC/ 326JM	364TC/ JM	326TC	364TC/ 365TC
P(max)	8	10	12	14	12	14	15	17	19	17	19
AG(max) (3)	18	20	22	24	22	24	26	30	31	30	31

SINGLE PHASE MOTORS

	X3 CONST.					
	143JM	145JM	182JM	184JM	213JM	215JM
P(max)	8	8	10	10	12	12
AG(max)	15	15	17	17	22	22

(1) Dimensions of cast surfaces vary $\pm 1/4$.

(2) 'HH' Dimension is slot, except 6095, 6012, & 8012 are holes.

(3) If head space requirement is critical, contact Factory.

In the interest of Product Improvement, dimensions are subject to change without notice.

ALL DIMENSIONS ARE IN INCHES.

Customer	City of Holbrook	P.O. No.		Job No.	
Project	Domestic Booster Pumps	Item No.		Certified By	
				Date	
HP	100	RPM	3550	HZ	60
V	460	ENCL	ODP	FR	364JM
Total Wgt.	817#				

THE PUMP COMPANY

327 N. 1ST STREET
 BUCKEYE, ARIZONA 85326
 OFFICE 623-327-1200
 FAX 623-386-7776

Estimate

Date	Estimate #
5/17/2012	1578

Name / Address
City of Holbrook

Project	
---------	--

Item	Description	Qty	Cost	Total
PARTS	Berkeley B5EPBMS 100hp 460 v 5x6 cent Prem eff odp motor trim to 8.19 1200 gpm @200'	2	11,256.96	22,513.92T
PARTS	100hp Softstart Panel 3r 48"x36"x16" wall mount	2	6,946.56	13,893.12T
PARTS	100hp VFD Panel 3r floor mount	1	9,632.00	9,632.00T
MISC.	MISC. PIPING & ELECTRICAL FITTINGS	1	1,459.65	1,459.65T
LABOR	Delivery of material	5	135.00	675.00
			Subtotal	\$48,173.69
			Sales Tax (7.3%)	\$3,467.40
			Total	\$51,641.09

THE PUMP COMPANY

327 N. 1ST STREET
 BUCKEYE, ARIZONA 85326
 OFFICE 623-327-1200
 FAX 623-386-7776

Estimate

Date	Estimate #
5/17/2012	1578

Name / Address
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LABOR	Delivery of material	5	135.00	675.00
			Subtotal	\$48,173.69
			Sales Tax (7.3%)	\$3,467.40
			Total	\$51,641.09

Randy Sullivan

From: Alan Beckom [abeckom@flowproductsaz.com]
Sent: Tuesday, May 22, 2012 10:16 AM
To: Cher Reyes
Cc: Randy Sullivan, Mark A. Tongen
Subject: Quote - City of Holbrook Booster Pump Replacement
Attachments: 20120530 - Quote- Mechanical Equip.pdf; Taco Equipment Submittals.pdf

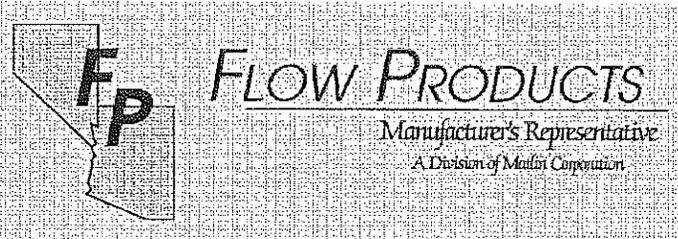
Attached is our quotation for equipment only for your project. This quotation does not include installation, unloading or setting of the pumps. This quotation carries a one year parts only warranty. All other miscellaneous equipment to be supplied by others. I have also attached material data sheets for your use. Please let us know if you require additional information.

Thank You,

Al Beckom
Estimator
Flow Products
PH (602) 470-8535
FAX (602) 470-8105
abeckom@flowproductsaz.com

visit us on the web at:
www.flowproductsaz.com

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Mechanical Equipment

QUOTATION

Total of five (5) pages
to this quotation.

PROJECT: City of Holbrook
Booster Pump Replacement
Holbrook, Arizona

DATE: May 22, 2012

ENGINEER: City of Holbrook

I am very pleased to present the following equipment quotation for your review and consideration.

2 each	<p>TACO, Model No. KS-8016, 8" x 8" x 16", 125# flanged cast iron bronze fitted radial split case single stage vertical inline pump with 416 stainless steel shaft, cast iron seal cover with balance chamber, inside balanced mechanical seal, bronze throttle bushing, external seal flush line, "split coupled" to: 150 HP, 1760 RPM, 460 Volt, 60 Cycle, 3 Phase, Premium Efficiency Open Drip Proof (ODP) motor, 445HP frame. Premium Efficient pump motors are inverter ready and suitable for operation with variable frequency drives (VFD). Capacity: 1200 GPM @ 200' TDH. - 75% Efficiency Motor Efficiency: 95.8% Weight: 3,160 lbs. each. <u>TAG:</u> Booster Pumps</p>	<p>\$14,334.00 each \$28,668.00 total</p>
1 each	<p>TACO, Model No. KS-3007, 3" x 3" x 7", 125# flanged cast iron bronze fitted radial split case single stage vertical inline pump with 416 stainless steel shaft, cast iron seal cover with balance chamber, inside balanced mechanical seal, bronze throttle bushing, external seal flush line, "split coupled" to: 40 HP, 3500 RPM, 460 Volt, 60 Cycle, 3 Phase, Premium Efficiency open drip-proof (ODP) motor, 286CZ frame. Capacity: 400 GPM @ 200' TDH. - 75% efficiency Motor Efficiency: 92.4% Weight: 540 lbs. <u>TAG:</u> Kicker Pump</p>	<p>\$3,719.00</p>

Las Vegas, Nevada
(702) 384-FLOW
Fax (702) 384-6331

3022 South 52nd Street
Tempe, Arizona 85282
(602) 470-8535
Fax (602) 470-8105

Reno Nevada
(775) 358-6777
Fax (775) 358-7785

2 each	TACO, Type RSP, Model No. SD080080-4, 8" system x 8" pump 125# flanged suction diffuser with ductile iron body and cover, removable 304 stainless steel strainer basket, brass fine mesh disposable screen, 304 stainless steel flow straightening vanes, adjustable foot support, tapped suction gauge port, and bottom blowdown connection. Weight: 275 lbs. each. <u>FOR:</u> Booster Pumps	\$959.00 each \$1,918.00 total
1 each	TACO, Type RSP, Model No. SD040030-4, 4" system x 3" pump 125# flanged suction diffuser with ductile iron body and cover, removable 304 stainless steel strainer basket, brass fine mesh disposable screen, 304 stainless steel flow straightening vanes, adjustable foot support, tapped suction gauge port, and bottom blowdown connection. Weight: 55 lbs. <u>FOR:</u> Kicker Pump	\$284.00
2 each	TACO, Model No. MPV-080-04, 8" 125# flanged "Plus Two" multi-purpose valve combination check, shut-off, flow measurement and balance valve with cast iron body, bronze gland, brass clapper, brass seat with O-ring seal, stainless steel stem sleeve, and non-lubricated cast iron plug. Valve features include bubble tight shut-off, non slam check valve, calibrated position indicator with scale for throttling service, memory stops, and shradr valve metering connections. Valve body configuration is of straight pattern and field convertible to a right angle pattern. Weight: 295 lbs. each. <u>FOR:</u> Booster Pumps	\$1,225.00 each \$2,450.00 total
1 each	TACO, Model No. MPV-060-04, 6" 125# flanged "Plus Two" multi-purpose valve combination check, shut-off, flow measurement and balance valve with cast iron body, bronze gland, brass clapper, brass seat with O-ring seal, stainless steel stem sleeve, and non-lubricated cast iron plug. Valve features include bubble tight shut-off, non slam check valve, calibrated position indicator with scale for throttling service, memory stops, and shradr valve metering connections. Valve body configuration is of straight pattern and field convertible to a right angle pattern.	



PROJECT: City of Holbrook Booster Pump Replacement

Page 3 of 5.

Weight: 135 lbs.
FOR: Kicker Pump

\$708.00

*The above quotation has been prepared with information provided by
The City of Holbrook narrative only. Specifications were not
available at time of quotation. We reserve the right to re-quote when
specification becomes available.*



Due to the current market conditions affecting copper and steel prices, this quotation is subject to any copper or steel surcharges that are in effect at time of order, regardless of the price protection period indicated on the attached Terms and Conditions of Sale.

This equipment quotation is based upon the project plans and specifications available at the time of bid. In preparing this quotation, every attempt has been made to fully comply with all applicable sections, details, and views except as noted. Any item(s) which should have been listed, but is not, is not included. A careful review of the specifications, drawings, and any addenda(s) should be made and then compared for compliance with this quotation.

Thank You,

Alan Beckom, Estimator
FLOW PRODUCTS – Tempe, Arizona
AJB

TERMS AND CONDITIONS OF SALE ATTACHED.



TERMS AND CONDITIONS OF SALE

UNLESS OTHERWISE INDICATED, PRICES QUOTED ARE FULL FREIGHT ALLOWED TO THE JOBSITE F.O.B. THEIR RESPECTIVE SHIPPING POINTS.

PRICES QUOTED ARE FIRM FOR A PERIOD OF THIRTY (30) DAYS. AFTER WHICH, RECONFIRMATION WILL BE REQUIRED. PRICES DO NOT INCLUDE ANY APPLICABLE SALES TAX.

WHERE QUANTITIES ARE NOT LISTED PRICES QUOTED ARE UNIT PRICE. ONCE ACTUAL QUANTITIES HAVE BEEN DETERMINED, ADDITIONAL DISCOUNTS MAY APPLY. PLEASE CONTACT OUR OFFICE CONCERNING QUANTITY DISCOUNTS.

FLOW PRODUCTS RESERVES THE RIGHT TO SELECT CARRIER AND DELIVERY TO THE CARRIER SHALL CONSTITUTE DELIVERY TO BUYER.

EACH SHIPMENT SHALL BE CONSTRUED, AS REGARDS TO DELIVERIES AND TERMS OF SETTLEMENT, A SEPARATE AND INDEPENDENT CONTRACT. IN CASE ANY LOT OR PARCEL SHALL NOT BE ACCEPTED AND/OR PAID FOR IN ACCORDANCE HEREWITH, THEN FLOW PRODUCTS MAY WITHOUT PREJUDICE TO OTHER LAWFUL REMEDY, DEFER FURTHER SHIPMENTS UNTIL SETTLEMENT IS MADE, TERMINATE THIS CONTRACT, OR TREAT SUCH FAILURE AS A BREACH OF THE ENTIRE CONTRACT.

SHIPPING SCHEDULES, PROVIDED EITHER WITH THE QUOTATION OR SEPARATELY, ARE NOT GUARANTEED, BUT ARE ESTIMATED FROM THE PREVAILING CONDITIONS AT THE DATE OF QUOTATION. ACTUAL SHIPPING SCHEDULES ARE SUBJECT TO CHANGE IN ACCORDANCE WITH THE PREVAILING CONDITIONS AT THE TIME THE PURCHASE ORDER IS ACCEPTED BY FLOW PRODUCTS AND RELEASED FOR MANUFACTURE BY BUYER.

FLOW PRODUCTS SHALL NOT BE FINANCIALLY LIABLE FOR ANY DEFAULT OR DELAY CAUSED BY ANY CONTINGENCY BEYOND ITS CONTROL, OR THE CONTROL OF ITS SUPPLIER OF MANUFACTURER, WITH WHOM IT MAY CONTRACT TO COVER THIS SALE, OR THE MANUFACTURER WHO IS TO FURNISH THESE GOODS, PREVENTING OR INTERFERING WITH FLOW PRODUCTS MAKING DELIVERY, INCLUDING WAR, RESTRAINTS AFFECTING SHIPPING, OR CREDIT, STRIKE, LOCKOUT, ACCIDENT, NONARRIVAL OR DELAY OF CARRIER, SHORT OR REDUCED SUPPLY OF RAW MATERIAL, OR EXCESSIVE COST THEREOF, OR OF PRODUCTION OVER CONTRACT BASIS, AND ANY OTHER CONTINGENCY AFFECTING FLOW PRODUCTS OR SUCH SUPPLIER OF MANUFACTURER.

UNLESS OTHERWISE INDICATED, PRICES QUOTED FOR ALL ELECTRIC MOTOR DRIVEN EQUIPMENT SUCH AS PUMPS, DO NOT INCLUDE MOTOR STARTERS, CONTROL PANELS, VARIABLE FREQUENCY DRIVES, POWER FACTOR CORRECTION DEVICES, OR ANY OTHER TYPE OF ELECTRICAL APPARATUS, OTHER THAN THE MOTOR BEING PROVIDED.

ALL FLEXIBLE COUPLED PUMPS/MOTORS ARE ALIGNED AT THE FACTORY PRIOR TO SHIPMENT. HOWEVER, ALL FLEXIBLE COUPLED PUMPS/MOTORS MUST BE ALIGNED AGAIN BY THE INSTALLING CONTRACTOR PRIOR TO THE START-UP OF THE EQUIPMENT. ALIGNMENT SHOULD BE PERFORMED IN ACCORDANCE WITH THE EQUIPMENT MANUFACTURER'S RECOMMENDATIONS AND AS PER THE HYDRAULIC INSTITUTE (HI), OR AS PER THE PROJECT SPECIFICATIONS WHERE APPLICABLE. EQUIPMENT FAILURE DUE TO THE IMPROPER ALIGNMENT BY THE INSTALLING CONTRACTOR WILL NOT BE COVERED UNDER WARRANTY.

UNLESS OTHERWISE INDICATED, PRICES QUOTED FOR EQUIPMENT DO NOT INCLUDE UNLOADING, SETTING, INSTALLATION OR START-UP. ALL FREIGHT THAT IS SHIPPED DIRECT FROM THE MANUFACTURER TO A DESTINATION OTHER THAN A FLOW PRODUCTS WAREHOUSE, MUST BE INSPECTED FOR DAMAGE, ERRORS AND/OR SHORTAGES BY THE RECEIVING PARTY AND MUST BE NOTED ON THE CARRIER'S BILL OF LADING AT THE TIME OF DELIVERY. FLOW PRODUCTS AND THE MANUFACTURER, WILL NOT BE HELD RESPONSIBLE OR LIABLE FOR COST INCURRED DUE TO IMPROPER INSPECTION FOR FREIGHT DAMAGE, ERRORS AND/OR SHORTAGES. FLOW PRODUCTS, MUST BE NOTIFIED IMMEDIATELY UPON THE RECEIPT OF DAMAGED FREIGHT, ERRORS OR SHORTAGES, BY THE RECEIVING PARTY. OTHERWISE, THE RECEIVING PARTY WAIVES ALL RIGHTS TO THE FILING OF ANY CLAIM.

UNLESS OTHERWISE INDICATED, THE PRICES QUOTED DO NOT INCLUDE ANY WARRANTY COVERAGE OTHER THAN THE MANUFACTURER'S STANDARD WRITTEN WARRANTIES. PLEASE CONTACT OUR OFFICE FOR A COPY OF THE RESPECTIVE MANUFACTURER'S WRITTEN WARRANTY.

UNLESS OTHERWISE INDICATED, PAYMENT TERMS ARE NET 30 DAYS FROM DATE OF OUR INVOICE. CUSTOMER AGREES TO RENDER PAYMENT IN ACCORDANCE WITH ALL TERMS SET FORTH. IN THE EVENT OF LEGAL PROCEEDINGS TO ENFORCE COLLECTION, CUSTOMER SHALL BE LIABLE FOR ATTORNEYS FEES AND EXPENSE OF COLLECTION. 1.5% INTEREST PER MONTH WILL BE ADDED TO ALL PAST DUE INVOICES. WE ACCEPT PAYMENTS VIA COMPANY CHECK, AMERICAN EXPRESS, VISA, & MASTERCARD.

FLOW PRODUCTS PRODUCT RETURNS POLICY

FLOW PRODUCTS WILL NOT ACCEPT ANY RETURNS WITHOUT PRE-AUTHORIZATION. ALL PRODUCTS WITHOUT A RETURN AUTHORIZATION NUMBER (RFC#) WILL BE REFUSED. AUTHORIZATION FOR CREDIT OR REPLACEMENT ON ALL RETURNS SHALL BE SUBJECT TO EVALUATION.

- MODEL NUMBERS AND SERIAL NUMBERS MUST BE PROVIDED ON ALL EQUIPMENT, WHERE APPLICABLE.
- NON-STOCK, OBSOLETE, OR CUSTOM FABRICATED PRODUCTS ARE NON-RETURNABLE.
- ALL RETURNS MUST BE SHIPPED BACK FREIGHT PRE-PAID.
- ALL AUTHORIZED RETURNS MUST BE RETURNED WITHIN 30 DAYS OR THE AUTHORIZATION WILL BE AUTOMATICALLY CANCELLED IN WHICH AT SUCH TIME YOU MUST RE-INITIATE THE REQUEST FOR RETURN AND A NEW AUTHORIZATION WILL BE ISSUED.

NON-WARRANTY RETURNS

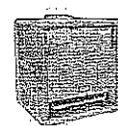
FLOW PRODUCTS WILL NOT ACCEPT ANY NON-WARRANTY RETURN AFTER 90 DAYS FROM THE DATE OF PURCHASE. NON-WARRANTY RETURNS MUST BE IN THE ORIGINAL PACKAGING AND MUST BE UNUSED. RESTOCK CHARGES WILL APPLY ON ALL NON-WARRANTY RETURNS.

WARRANTY RETURNS

ALL WARRANTY RETURNS ARE SUBJECT TO THE MANUFACTURER'S WRITTEN WARRANTY. THE MANUFACTURER'S WARRANTY DOES NOT COVER LABOR OR FREIGHT.

CUSTOMER SATISFACTION IN AUTHORIZED CREDITS OR REPLACEMENTS IS OUR GOAL AND EXPEDITING THOSE FOR OUR CUSTOMER CAN HAPPEN ONLY IF THE ABOVE PROCEDURES ARE FOLLOWED. THANK YOU.

Pr 1 of 1 FORM #FP-09241d





Submittal Data Information

KS Series Vertical Split Coupled Pumps

301-1711T

MODEL 8016

1760 RPM

JOB: City of Holbrook Booster Pumps

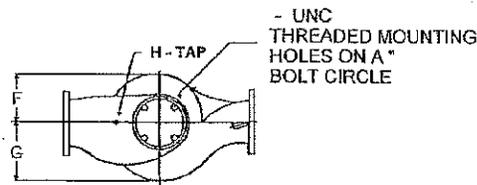
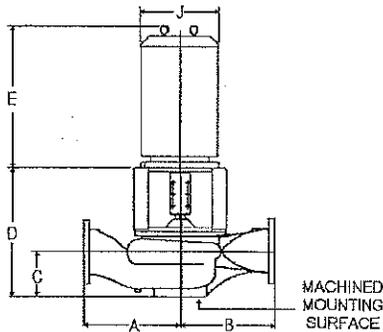
CONTRACTOR:

ENGINEER:

REP: Flow Products

COMMENTS: Premium Efficiency ODP Enclosure. Motor Efficiency: 95.8%. Pump/Motor Weight: 3,160 lbs

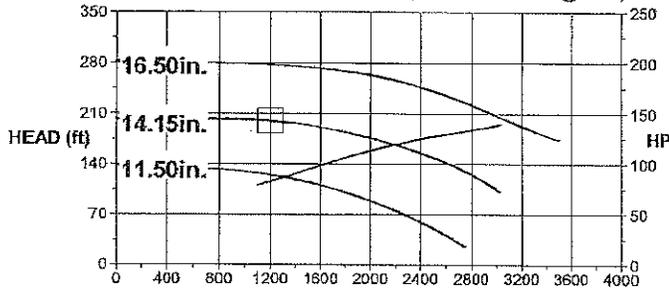
ITEM NO.	MODEL NO.	IMP. DIAM. / IN.	FLOW / GPM	HEAD / FT	POWER / HP	ELEC. CHARS
Booster Pumps	KS8016	14.1	1200	200	150	460/60/3



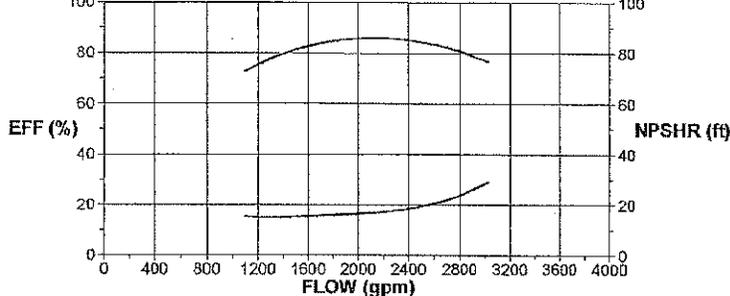
* Dimensions in inches. Do not use for construction purposes unless certified.

CONN.	HP	FRAME	Flange Size ASA	125 psi Flange		C	D	E	F	G	H	J
				A	B							
8x8	150	445HP	20.75	26.13	24.00	16.70	33.95	43.49	12.28	15.56	0.25	24.56

PUMP PERFORMANCE CURVES (based on Water @ 60 F)



KS8016 RPM: 1760 IMPELLER DIAM: 14.15 in.



Item	BRONZE FITTED	
	Standard	Optional
Casing	Cast Iron ASTM A48 Class 30A	
Impeller	Bronze ASTM B584-836	CF
Wear Ring	None	
Shaft	St. Steel AISI 416 ASTM A582	
Coupling	Aluminum Alloy 6061-T6	
Mech. Seal	Ceramic EPT	
Seal Flush Line	Copper	CF

OPERATING SPECIFICATIONS

	Standard		Optional
	125# 860K	250# 1720	
Flange			
Pressure	175 PSIG	300 PSIG	CF
	1210 KPA	2070 KPA	CF
Temperature	250F 120C	250F 120C	CF

CF - Consult Factory

Do it once. Do it right.

TACO, INC., 1160 Cranston Street, Cranston, RI 02920 Telephone: (401)942-8000 FAX: (401)942-2360.
 TACO (Canada), Ltd., 6180 Ordan Drive, Mississauga, Ontario L5T 2B3. Telephone: 905/564-9422. FAX: 905/564-9436



Submittal Data Information

KS Series Vertical Split Coupled Pumps

301-1169T

MODEL 3007

3500 RPM

JOB: City of Holbrook Booster Pumps

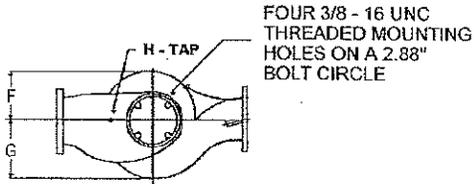
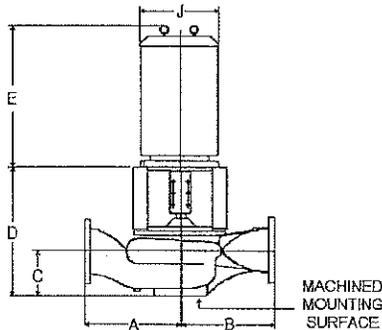
CONTRACTOR:

ENGINEER:

REP: Flow Products

COMMENTS: Premium Efficiency ODP Enclosure. Motor Efficiency: 92.4%. Pump/Motor Weight: 540 lbs.

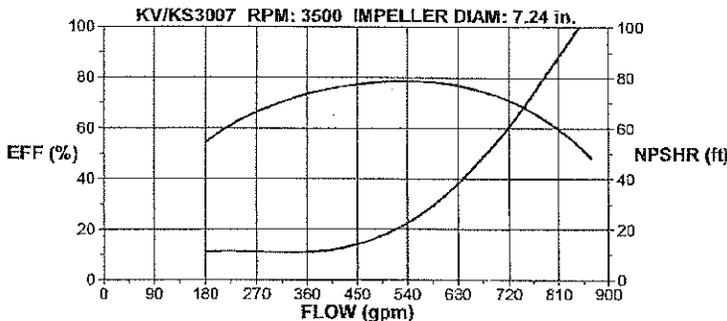
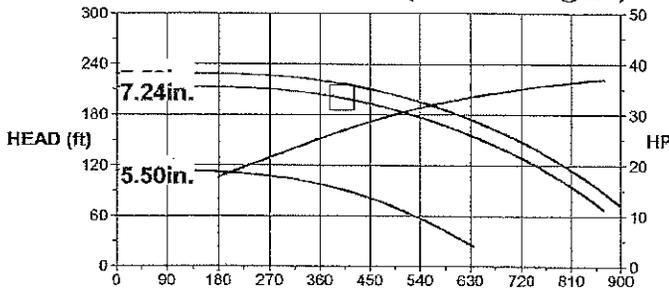
ITEM NO.	MODEL NO.	IMP. DIAM. / IN.	FLOW / GPM	HEAD / FT	POWER / HP	ELEC. CHARS
Kicker Pump	KS3007	7.2	400	200	40	460/60/3



*Dimensions in inches. Do not use for construction purposes unless certified.

CONN.	HP	FRAME	Flange Size ASA	125 psi Flange		C	D	E	F	G	H	J
				A	B							
3x3	40	286CZ	3	10	10	6.30	21.95	29.14	5.29	6.31	.25	14.63

PUMP PERFORMANCE CURVES (based on Water @ 60 F)



Item	BRONZE FITTED	
	Standard	Optional
Casing	Cast Iron ASTM A48 Class 30A	
Impeller	Bronze ASTM B584-836	CF
Wear Ring	None	
Shaft	St. Steel AISI 416 ASTM A582	
Coupling	Aluminum Alloy 6061-T6	
Mech. Seal	Ceramic EPT	
Seal Flush Line	Copper	CF

OPERATING SPECIFICATIONS

	Standard		Optional
	125# 860K	250# 1720	
Flange			
Pressure	175 PSIG	300 PSIG	CF
	1210 KPA	2070 KPA	CF
Temperature	250F 120C	250F 120C	CF

CF - Consult Factory

Do it once. Do it right.

TACO, INC., 1160 Cranston Street, Cranston, RI 02920 Telephone: (401)942-8000 FAX: (401)942-2360.
TACO (Canada), Ltd., 6180 Ordan Drive, Mississauga, Ontario L5T 2B3. Telephone: 905/564-9422. FAX: 905/564-8436



Submittal Data Information

Suction Diffuser Rear Strainer Pullout (RSP) "Flanged"

301-239

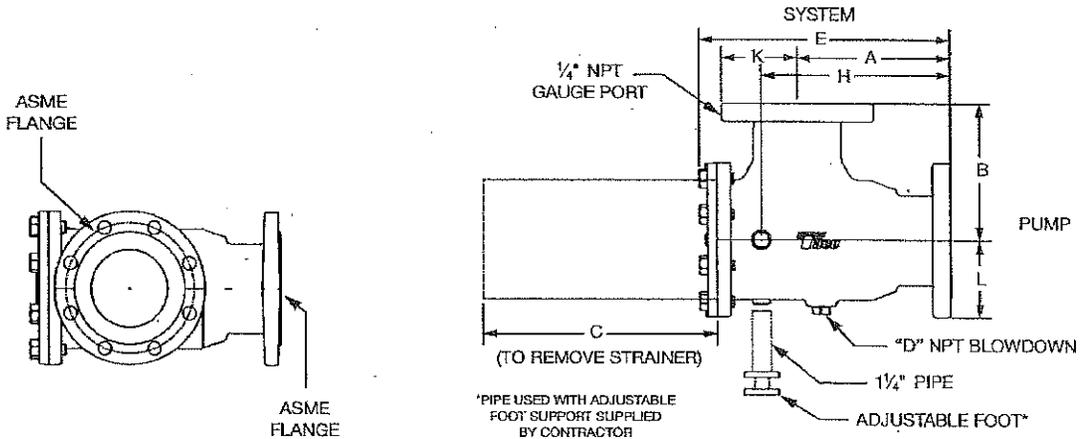
SUPERSEDES: September 1, 2008

EFFECTIVE: June 1, 2011

JOB _____ ENGINEER _____ CONTRACTOR _____ REP. _____

ITEM	QUANTITY	MODEL NO.	SIZE

DIMENSIONS



Model Number	System	Pump	C _v	Free Area (sq. in.)	A (Class 125)*	A (Class 250)*	B	C	D	E (Class 125)*	E (Class 250)*	H (Class 125)*	H (Class 250)*	K (Class 125)*	K (Class 250)*	L (Class 125)*	L (Class 250)*	WGT. (Class 125)*	WGT. (Class 250)*
SD020015-4	2 Flanged	1½ Flanged	54	21	5.69 (145)	6.06 (154)	5.39 (137)	8.49 (216)	¾	9.25 (235)	9.62 (244)	6.92 (176)	7.29 (185)	3.00 (076)	3.25 (083)	2.50 (064)	3.06 (078)	22 (010)	27 (012)
SD020020-4	2 Flanged	2 Flanged	106	21	5.44 (138)	5.69 (145)	5.39 (137)	8.24 (209)	¾	9.00 (229)	9.25 (235)	6.67 (169)	6.92 (176)	3.00 (076)	3.25 (083)	3.00 (076)	3.25 (083)	24 (011)	28 (013)
SD025020-4	2½ Flanged	2 Flanged												3.50 (089)	3.75 (095)	3.00 (076)	3.25 (083)	27 (012)	35 (016)
SD030020-4	3 Flanged	2 Flanged												3.75 (095)	4.12 (105)	3.00 (076)	3.25 (083)	29 (013)	39 (018)
SD025025-4	2½ Flanged	2½ Flanged												135	24	6.06 (154)	6.56 (167)	6.01 (153)	8.97 (228)
SD030025-4	3 Flanged	2½ Flanged	3.75 (095)	4.12 (105)	3.50 (089)	3.75 (095)	38 (017)	52 (024)											
SD030030-4	3 Flanged	3 Flanged	220	35	6.86 (174)	7.62 (194)	6.56 (167)	10.47 (266)	1	11.41 (290)	12.18 (309)	8.32 (211)	9.09 (231)	3.75 (089)	4.12 (105)	3.75 (089)	4.12 (105)	50 (023)	66 (030)
SD040030-4	4 Flanged	3 Flanged												4.50 (114)	5.00 (095)	3.75 (089)	4.12 (105)	55 (025)	72 (033)
SD040040-4	4 Flanged	4 Flanged												4.50 (114)	5.00 (127)	4.50 (114)	5.00 (127)	73 (033)	91 (041)
SD050040-4	5 Flanged	4 Flanged	380	64	7.94 (202)	8.93 (227)	8.45 (215)	12.86 (327)	1	13.96 (355)	14.90 (378)	10.29 (261)	11.28 (287)	5.00 (127)	5.50 (140)	4.50 (114)	5.00 (127)	75 (034)	97 (044)
SD060040-4	6 Flanged	4 Flanged												5.50 (140)	6.25 (159)	4.50 (114)	5.00 (127)	79 (036)	109 (049)

NOTE: Dimensions are in inches. Metric dimensions are in millimeters and are in parentheses (). Weights are in lb (kg).

*C¹ is the distance required to replace strainer.

* Append 'A' for Class 250 working pressure flanged units (pump side) — e.g. Model Number SD040030-4A.

DIMENSIONS (continued)

Model Number	System	Pump	C _v	Free Area (sq. in.)	A (Class 125)*	A (Class 250)*	B	C	D	E (Class 125)*	E (Class 250)*	H (Class 125)*	H (Class 250)*	K (Class 125)*	K (Class 250)*	L (Class 125)*	L (Class 250)*	WGT. (Class 125)*	WGT. (Class 250)*
SD050050-4	5 Flanged	5 Flanged	669	100	10.06 (256)	10.06 (256)	8.94 (227)	15.36 (390)	1	16.54 (420)	16.54 (420)	12.48 (317)	12.48 (317)	5.00 (127)	5.50 (140)	5.00 (127)	5.50 (140)	90 (041)	116 (053)
SD060050-4	6 Flanged	5 Flanged												5.50 (140)	6.25 (159)	5.00 (127)	5.50 (140)	96 (044)	127 (058)
SD060060-4	6 Flanged	6 Flanged	985	146	11.58 (294)	12.08 (307)	11.17 (284)	19.02 (483)	1	20.39 (518)	20.89 (531)	16.17 (411)	16.67 (423)	5.50 (140)	6.25 (159)	5.50 (140)	6.25 (159)	151 (069)	193 (088)
SD080060-4	8 Flanged	6 Flanged												6.75 (171)	7.50 (191)	5.50 (140)	6.25 (159)	170 (077)	215 (098)
SD100060-4	10 Flanged	6 Flanged												8.00 (203)	8.75 (222)	5.50 (140)	6.25 (159)	182 (083)	238 (109)
SD080080-4	8 Flanged	8 Flanged	1657	248	14.43 (367)	15.31 (389)	13.21 (336)	23.79 (604)	1	25.32 (643)	26.19 (665)	20.22 (514)	21.1 (536)	6.75 (171)	7.50 (191)	6.75 (171)	7.50 (191)	271 (123)	319 (145)
SD100080-4	10 Flanged	8 Flanged												8.00 (203)	8.75 (222)	6.75 (171)	7.50 (191)	284 (129)	351 (159)
SD120080-4	12 Flanged	8 Flanged												9.50 (241)	10.25 (260)	6.75 (171)	7.50 (191)	305 (138)	388 (176)
SD100100-4	10 Flanged	10 Flanged	2650	394	18.36 (466)	19.61 (498)	14.54 (369)	29.40 (747)	1	31.10 (790)	32.35 (822)	25.64 (651)	26.89 (683)	8.00 (203)	8.75 (222)	8.00 (203)	8.75 (222)	400 (182)	482 (219)
SD120100-4	12 Flanged	10 Flanged												9.50 (241)	10.25 (260)	8.00 (203)	8.75 (222)	420 (191)	518 (235)
SD140100-4	14 Flanged	10 Flanged												11.50 (292)	10.25 (260)	8.00 (203)	8.75 (222)	441 (200)	557 (253)
SD120120-4	12 Flanged	12 Flanged	3000	570	20.39 (518)	22.64 (575)	16.62 (422)	33.72 (856)	1	35.50 (902)	37.75 (959)	29.83 (759)	32.08 (815)	9.50 (241)	10.25 (260)	9.50 (241)	10.25 (260)	589 (267)	703 (319)
SD140120-4	14 Flanged	12 Flanged												11.50 (292)	11.50 (292)	9.50 (241)	10.25 (260)	617 (280)	786 (357)
SD160120-4	16 Flanged	12 Flanged												11.75 (298)	12.75 (324)	9.50 (241)	10.25 (260)	651 (296)	802 (364)
SD140140-4	14 Flanged	14 Flanged	3940	628	22.31 (567)	22.31 (567)	19.26 (489)	34.00 (864)	1	37.66 (957)	37.66 (957)	31.61 (803)	31.61 (803)	10.50 (267)	11.50 (292)	10.50 (267)	11.50 (292)	895 (406)	1049 (476)
SD160140-4	16 Flanged	14 Flanged												11.75 (298)	12.75 (324)	10.50 (267)	11.50 (292)	934 (424)	1106 (502)

NOTE: Dimensions are in inches. Metric dimensions are in millimeters and are in parentheses (). Weights are in lb (kg).
 *C' is the distance required to replace strainer.

* Append 'A' for Class 250 working pressure flanged units (pump side) - e.g. Model Number SDG040030-4A.

FEATURES

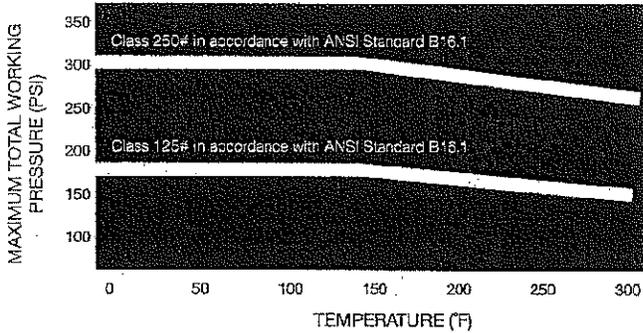
- Full Length Straightening Vane Assembly ensures uniform flow to the suction inlet of the pump
- Oversized Body Cylinder ensures minimal pressure drop
- Metering Port allows for the monitoring of system conditions
- Disposable Fine Mesh Start-Up Strainer promotes cleaner, more trouble-free system
- Removable Cover Plate and reusable "O" Ring allows for easy access and maintenance of Permanent Strainer
- Blow Down port allows for routine maintenance and removal of sediment and debris
- Ductile Iron Body on all units
- Optional Magnetic Insert to trap small metallic particles
- Available with Class 125* flanges or Class 250* flanges. Consult pressure/temperature chart below for operating limitations. (Flanged units are raised faced design.)

(All sizes available with optional DIN Flanges. Consult factory for details)

MATERIALS OF CONSTRUCTION

- | | |
|------------------------------|-------------------------|
| Body | - Ductile Iron |
| Cover | - Ductile Iron |
| Straightening Vanes | - Stainless Steel (304) |
| Permanent Strainer | - Stainless Steel (304) |
| Disposable Start Up Strainer | - Bronze (16 Mesh) |
| Cover O-Ring | - EPDM |

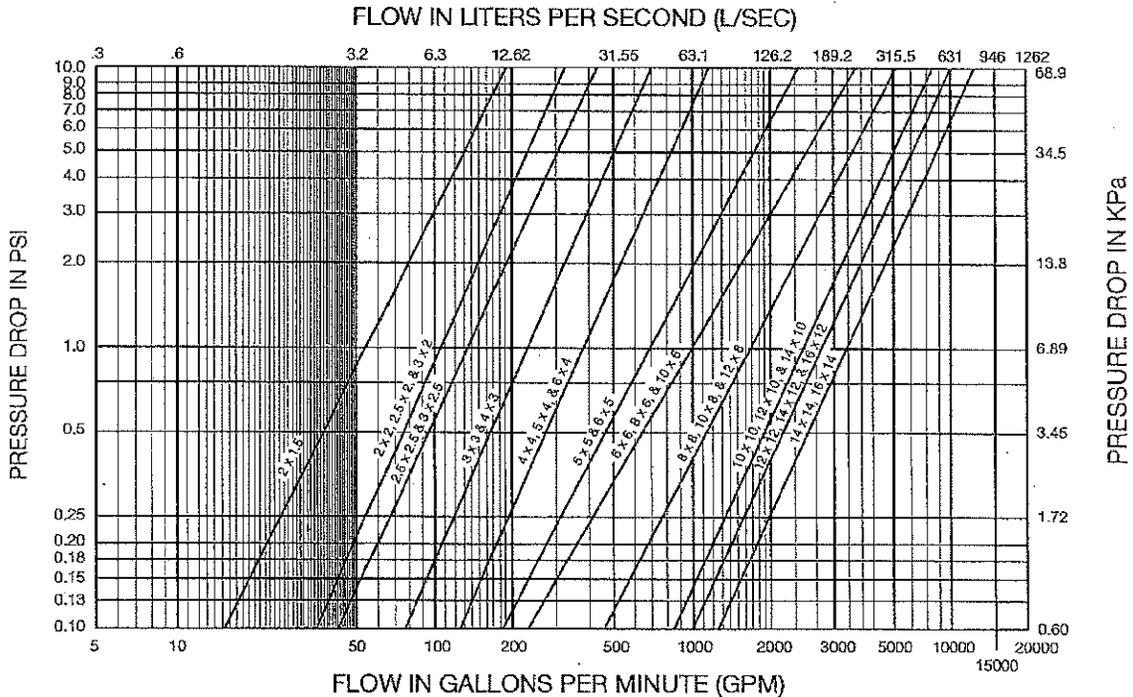
PRESSURE TEMPERATURE RATINGS



OPERATING SPECIFICATIONS

	Standard	Optional
Flange	Class 125*	Class 250*
Pressure	175 PSIG* (1210 KPA)	300 PSIG* (2070 KPA)
Temperature	250°F (120°C**)	250°F (120°C**)

* Per Pressure Temperature Ratings chart to left.





Submittal Data Information

Plus Two Multi-Purpose Valve

301-235

SUPERSEDES: February 20, 2006

EFFECTIVE: March 1, 2006

JOB _____ ENGINEER _____ CONTRACTOR _____ REP. _____

ITEM	QUANTITY	MODEL NO.	SIZE
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DIMENSIONS

Model Number	Size	Connection	A	B (125#)	B (250#)	C	D	E	F	Cv	Weight (125#)	Weight (250#)
MPV 015-4	1½ (38.1) NPT	Threaded	8.00 (203)	1.44 (037)	1.44 (037)	4.70 (119)	2.39 (061)	5.64 (143)	1.3 (33.0)	69	12 (5.5)	12 (5.5)
MPV 020-4	2 (50.8) NPT	Threaded	8.00 (203)	1.44 (037)	1.44 (037)	4.70 (119)	2.39 (061)	5.64 (143)	1.3 (33.0)	77	12 (5.5)	12 (5.5)
MPV 025-4	2½ (63.5) NPT	Threaded	10.63 (270)	1.93 (049)	1.93 (049)	4.97 (126)	3.50 (089)	7.30 (185)	1.6 (40.6)	122	32 (15)	32 (15)
MPV 030-4*	3 (76.2)	Flanged	11.75 (298)	3.75 (095)	4.13 (105)	6.15 (156)	3.90 (099)	7.85 (199)	1.8 (45.7)	209	38 (17)	46 (21)
MPV 040-4*	4 (101.6)	Flanged	13.75 (349)	4.50 (114)	4.50 (114)	8.51 (216)	4.18 (106)	9.63 (245)	2.1 (53.3)	366	67 (30)	84 (38)
MPV 050-4*	5 (127.0)	Flanged	17.63 (448)	5.00 (127)	5.50 (140)	11.26 (286)	5.25 (133)	12.28 (312)	2.4 (61.0)	459	105 (48)	126 (57)
MPV 060-4*	6 (152.4)	Flanged	20.35 (517)	5.50 (140)	6.25 (159)	11.28 (287)	6.07 (154)	14.23 (361)	2.7 (68.6)	701	134 (61)	176 (80)
MPV 080-4*	8 (203.2)	Flanged	25.88 (657)	6.75 (171)	7.50 (191)	13.58 (345)	6.75 (171)	19.13 (486)	3.9 (99.1)	1200	293 (133)	341 (155)
MPV 100-4*	10 (254.0)	Flanged	30.00 (762)	8.00 (203)	8.75 (222)	15.82 (402)	8.81 (224)	21.20 (538)	4.4 (111.8)	1826	466 (212)	536 (243)
MPV 120-4*	12 (304.8)	Flanged	36.70 (932)	9.50 (241)	10.25 (260)	17.54 (446)	9.98 (253)	26.64 (667)	4.9 (124.5)	2430	724 (329)	811 (368)

NOTE: Dimensions are in inches. Metric dimensions are in millimeters and are in parentheses (). Weights are in lb (kg).

*F is the distance required to replace packing under pressure. *A,C,D,E,F apply to 250# valve also.

* Append 'A' for 250# working pressure (e.g. Model Number MPV 030-4A).

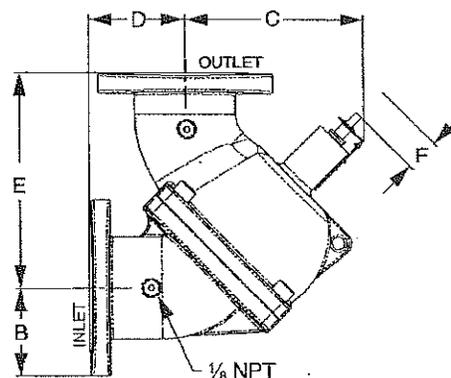
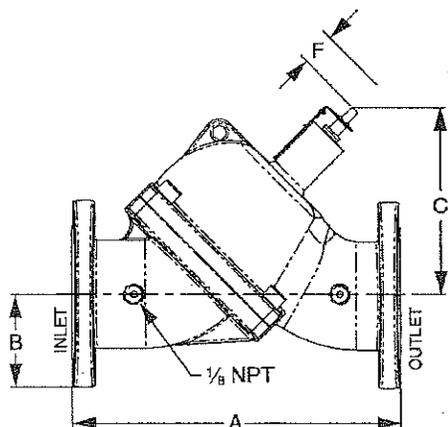
FEATURES

- Horizontal or Vertical Installation
- Field Convertible to a Right Angle Valve
- Stem Seal Packing (replaceable under pressure)
- Bronze Fitted Construction
- Memory Indicator, Pointer and Scale
- Strainer Valve Metering Connections
- "O" Ring Sealed Valve Body
- Replaceable "Soft Seal"
- Low Pressure Drop (equal to or better than any comparable valve on the market today)
- Five (5) Valves in One:
 - Shut Off Valve
 - Flow Control Valve (globe style)
 - Non Slam Check Valve
 - Flow Metering Valve
 - Straight Pattern Valve Convertible to a Right Angle Pattern Valve
- Available in 125 psi and 250 psi Working Pressure
- Available with Flanged or Grooved End Connections

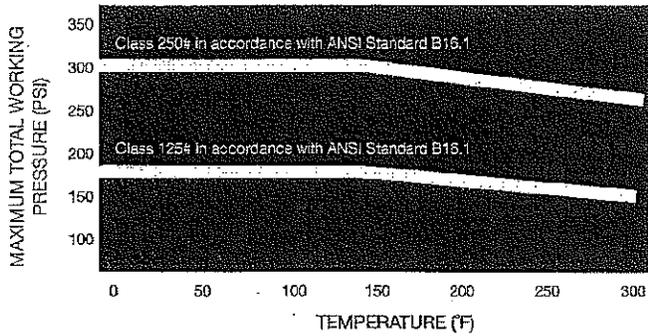
(All sizes available with optional DIN flanges. Consult Factory for details.)

MATERIALS OF CONSTRUCTION

- Body - Ductile Iron
- Spring - Stainless Steel (302)
- Gland - Bronze
- Stem Packing - Teflon Impregnated Aramid Fiber (asbestos free)
- Stem - Bronze/Stainless Steel (416)
- Seat - EPDM
- Seat Disc - Bronze
- Body O-Ring - EPDM



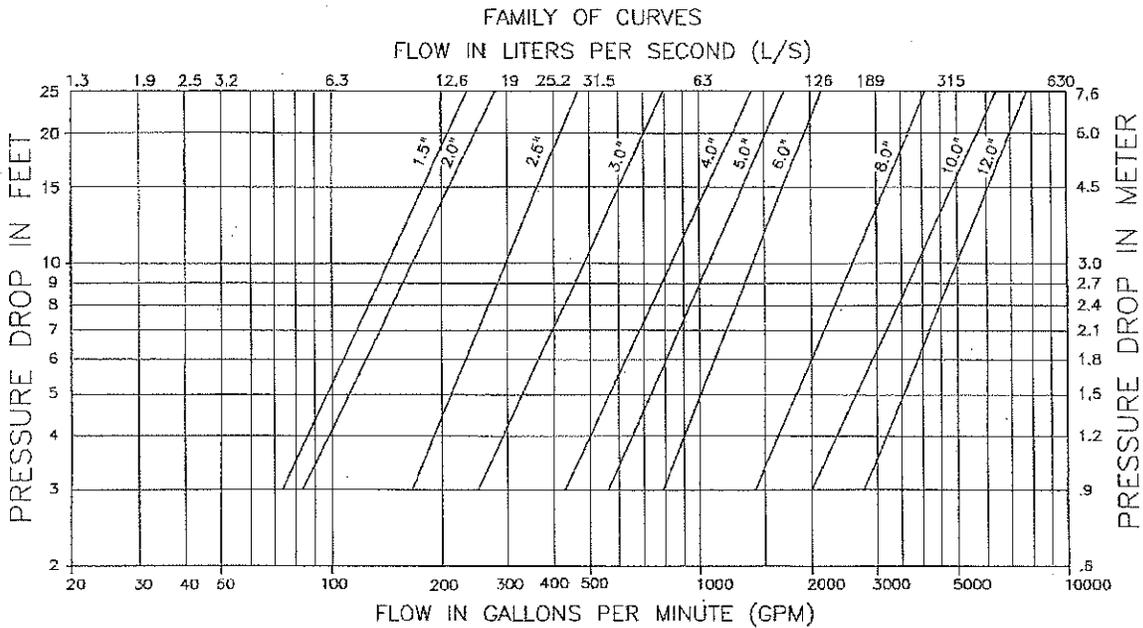
PRESSURE TEMPERATURE RATINGS



OPERATING SPECIFICATIONS

	Standard	Optional
Flange	Class 125*	Class 250*
Pressure	175 PSIG* (1210 KPA)	300 PSIG* (2070 KPA)
Temperature	250°F (120°C**)	250°F (120°C**)

* Per Pressure Temperature Ratings chart to left.



Do it Once. Do it Right.®

TACO, INC., 1160 Cranston Street, Cranston, RI 02920 Telephone: (401) 942-8000 FAX: (401) 942-2360.
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 Visit our web site at: <http://www.taco-hvac.com>

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HOLBROOK CITY COUNCIL

AGENDA ITEM

ISSUE/ITEM: Discussion/possible action regarding fence bids at Hunt park baseball field and Lizitsky.

DATE OF MEETING: December 18th, 2012

ACTION REQUESTED: Authorization to award bid to Navapache Fence for the replacement fence around Hunt Park Baseball field and improvements the Lizitsky.

BACKGROUND: The current fence around the baseball field at Hunt Park is in disrepair. The City in conjunction with the Holbrook School district would like to repair this fence. Bids were asked to be broken down for each project with the potential of total project being rewarded depending on funding. The School District has agreed to help pay \$9,500.00 for this project. Navapache Fence was the lowest bidder in 2 of the bids and the lowest bidder over all. We recommend awarding the entire project to Navapache fence in the sum of \$23,405.16 with \$9,500.00 coming from the Holbrook School District.

GENERAL PLAN:

IF A BID, LIST VENDORS:

BID SENT TO: Northern Fence Company, Navapache, Frontier, Liberty

BUDGET LINE: 001-031-5073 – \$13,905.16

FUNDS AVAILABLE: \$18,500.00 Improvements
\$9,500 from Holbrook Unified School District

Approvals (as required) City Manager _____

Finance Director _____

Break down of Fence Bids for Baseball fields

<u>Bid #</u>	<u>Northern Fence Company</u>	<u>Navapache Fence</u>	<u>Frontier Fence</u>	<u>Liberty Fence</u>
Bid #1	9,006.00	7,965.31	8,974.00	\$5800.00*
Bid #2	9,204.00	9,691.79	9,565.00	10,700.00
Bid #3	2,876.00	3,087.16	2,854.00	4,250.00
Total	21,086.00	20,744.26	21,393.00	20,750.00
			20,874.00	
			519.00	

<u>Bid #</u>	<u>Northern Fence Company</u>	<u>Navapache Fence</u>	<u>Frontier Fence</u>	<u>Liberty Fence</u>
Bid #4	3,698.00	2,660.90	2,676.00	2,995.00
Total	24,784.00	23,405.16	23,550.00	23,745.00

School has agreed to pay \$9,500.00 for Bid#2 sidelines and dugouts

*Liberty didn't bid enough fencing



Arizona License ROC218285
 PHONE (928) 536-3692
 CELL (928) 892-2448
 CHEREN@NAVAPACHEFENCE.COM

*with Chris
 FAY
 928 536-3692*

PROPOSAL

PROJECT: Holbrook Ball Field

Bid 1 outfield 592' of 6' chain link fence 9 gauge chain link mesh 9 gauge tension wire on bottom of fence 2 7/8" x ss40 terminal and gate post 1 7/8" x ss40 line post 8' on center 1 5/8" x ss40 top rail	LS			\$ 7,474.60 Tax 490.71 \$ 7,965.31
Bid 2 sidelines and dougouts 636' of 6' chain link fence 9 gauge chain link mesh 9 gauge tension wire on bottom of fence 2 7/8" x ss40 terminal and gate post 1 7/8" x ss40 line post 8' on center 1 5/8" x ss40 top rail 1 - 12' double swing gate with drop rod assembly	LS			\$ 9,094.72 Tax 597.07 \$ 9,691.79
Bid 3 backstop Weld 1 5/8" x ss40 to bottom of backstop for bottom rail Add 6 gauge 6' tall mesh to bottom of existing backstop Add 9 gauge mesh to top of existing backstop	LS			\$ 2,896.98 Tax 190.19 \$ 3,087.16
Bid 4 parking lot 121' of 6' chain link fence 9 gauge chain link mesh 9 gauge tension wire on bottom of fence 2 7/8" x ss40 terminal and gate post 1 7/8" x ss40 line post 8' on center 1 5/8" x ss40 top rail 1 - 8' double swing gate with drop rod assembly				\$ 2,496.98 Tax 163.93 \$ 2,660.90

Terminal post will be set 2'6" x 12" Line post 2' x 12"

Estimator: Christopher Heren

Exclusions: Traffic Control, Permits, asphalt under and around guardrail and ends, bond, engineering, surveying, traffic control, grubbing, grading, staking, hand digging, clearing, special coating, locking hardware other than standard fence hardware, electrical and conduits, sub grade, layout, core drilling, all grounding, all holes other than round post holes, specialty locating service, permits, saw cut, solid rock, guillotine doors, mow strip under fence, concrete for attenuator, and removal of old fence.

All work to be performed contract documents or AFA standards. Any alteration or deviation from documents will be executed only upon

PO box 1174 Taylor, Arizona (928)536-3692

OWNER approved change orders at an additional cost. It is agreed that any change orders will be processed within thirty (30) days. All payments are net 30 from invoice dates, unless discounts have been discussed prior to bid time.

All bids are good for twenty (20) days.

ACCEPTANCE: the above prices, specifications and conditions are satisfactory and are hereby accepted. You are authorized to perform the work as specified.

Signature: _____

Date: _____

FRONTIER FENCE COMPANY, LLC

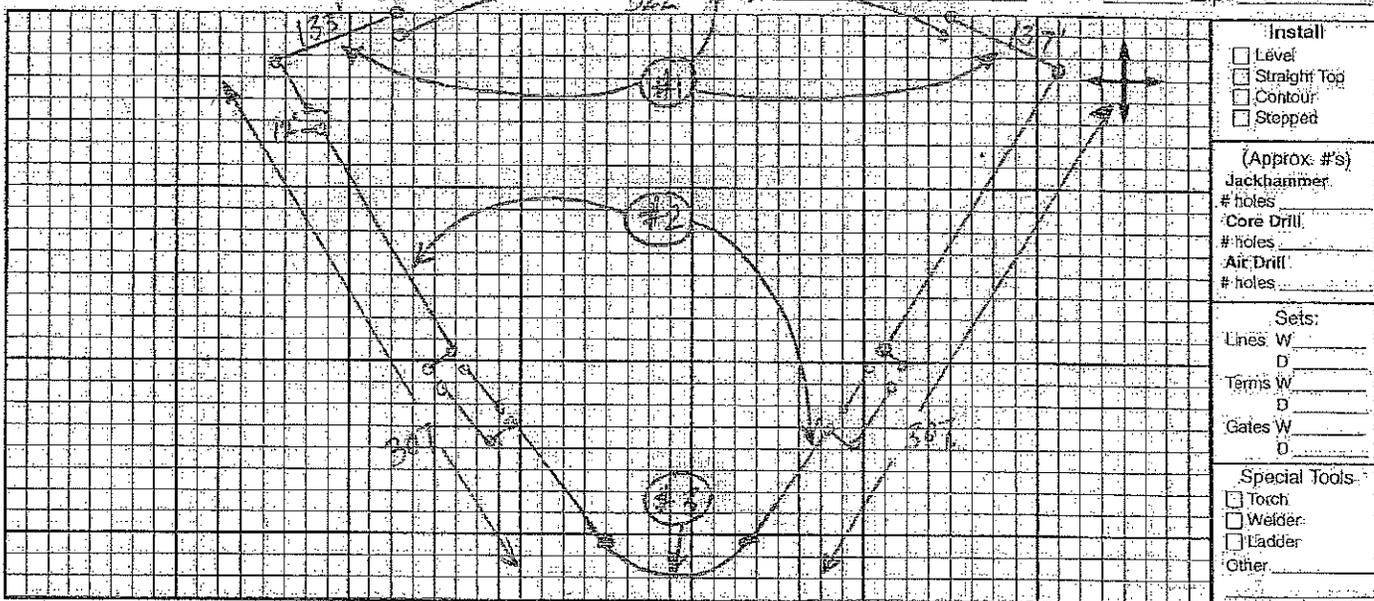
R. Sullivan @ c. Holbrook, AZ, US
CONTRACT #

P.O. Box 1778
 Snowflake, AZ 85937
 Phone: (928) 536-2950

Arizona Contractor's License # 264088

Phone Number <i>524-6735</i>	Date <i>11/16/12</i>
Mobile Phone # <i>241-0346</i>	Fax Number <i>524-3159</i>

Proposal To: *City of Holbrook*
 Job Address: *HUNT PARK* City: *Holbrook* State: *AZ* Zip: _____
 Billing Address: _____ City: _____ State: _____ Zip: _____



Install

Level
 Straight Top
 Contour
 Stepped

(Approx. #'s)
Jackhammer
 # holes _____
Core Drill
 # holes _____
Air Drill
 # holes _____

Sets:
 Lines W _____
 D _____
 Terms W _____
 D _____
 Gates W _____
 D _____

Special Tools:
 Torch
 Welder
 Ladder
 Other _____

SPECIFIC CONDITIONS MUST BE NOTED. FAILURE TO NOTE SPECIFIC CONDITIONS (HARD DIG, BURIED LINES, ETC) WILL RESULT IN ADDITIONAL CHARGES.
 All hand dug holes \$ _____ per hole. C.I. Line Stake set by buyer. C. I. _____

Special Instructions: *All old materials will be removed by City. Bricks top will be striped of wire & repaired. All posts are set in concrete. Hwy City Sub 40 framework.*

SLATS		CHAIN LINK GATES	
Color _____	Style <i>Drive</i>	Style _____	Style _____
Type _____	Quantity <i>1</i>	Quantity _____	Quantity _____
Pattern _____	Wt X Ht <i>12x6</i>	Wt X Ht _____	Wt X Ht _____
	Frame Size <i>17 1/2"</i>	Frame Size _____	Frame Size _____
	Hinge _____	Hinge _____	Hinge _____
	Latch _____	Latch _____	Latch _____
	Closer _____	Closer _____	Closer _____

CHAIN LINK FENCE													
Fabric				Line Posts		Rails				Terminals	Barb	Barb	
Footage	Ht.	Ga.	Mesh	Space	OD	Ga.	OD	Ga.	T/M/B	OD	Ga.	Wire	Tape
<i>1284</i>	<i>6'</i>	<i>9 1/2"</i>	<i>2"</i>	<i>8"</i>	<i>17 1/2</i>	<i>40</i>	<i>15 1/8</i>	<i>40</i>	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<i>27 1/2</i>	<i>40</i>		
<i>40'</i>	<i>16'</i>	<i>6, 9, 9</i>	<i>2"</i>	<i>existing</i>					<i>same to be defined by City</i>				

ORNAMENTAL IRON, VINYL FENCE, WOOD FENCE or HORSE/CORRAL											
Footage	Type**	Ht.	Line Posts		Pickets		Rail		# of Rails	Panel Width	Color
			Spacing	OD	Ga.	Space	OD	OD			

ORNAMENTAL IRON GATES											
Style	Sgl Ht x W	Dbl Ht x W	Slide Ht x W	Picket OD	Color	Rail Gauge	Rail OD	Gate Post OD	Latch Type	Hinge Type	Brace & Truss

EXTRA

Trim Trees	FFC	Cust
Clear Line		X
Remove Fence		X
Haul Fence		X
Trench		

#1 = \$ *8,974.00*
 #2 = \$ *9,565.00*
 #3 = \$ *2,854.00*
TOTAL: all 3 together \$ *20,374.00*

By Execution of this document, Buyer acknowledges that he/she has read and understands the terms and conditions set forth and within any attachments. Seller shall not be responsible for any Buyer shall hold harmless. Frontier Fence Company from any and all damages or liabilities resulting from any cut or damaged lines including, but not limited to, gas, water, sprinkler, electric, telephone, fiber optic, cable. Buyer shall comply with all applicable statutes and codes relating to the location of utility lines.

This offer guaranteed for 30 days

Accepted by Buyer: _____

Sales Person: *[Signature]*

Approved by Contractor's Manager: _____

Terms: Cash due upon substantial completion. LEAVE FENCE SIGNS INTACT FOR WARRANTY TO BE IN EFFECT

Down Payment: \$ _____

Check # _____

BALANCE: \$ _____

FRONTIER FENCE COMPANY, LLC

P.O. Box 1778
Snowflake, AZ 85937
Phone: (928) 536-2950

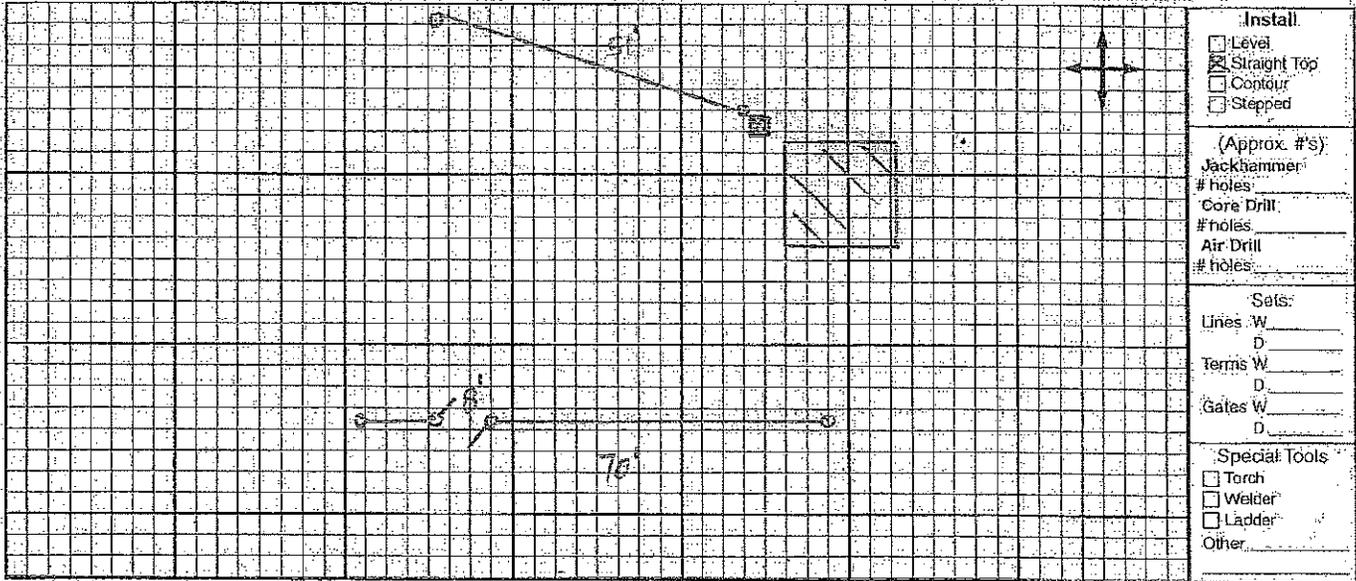
Arizona Contractor's License # 264088

Scott McNeil # 928-521-0395

CONTRACT # _____

Phone Number:	Date: <u>11/16/12</u>
Mobile Phone #	Fax Number:

Proposal To: City of Holbrook
 Job Address: Liz + Sky Park City: Holbrook State: AZ Zip: _____
 Billing Address: _____ City: _____ State: _____ Zip: _____



Install

Level
 Straight Top
 Contour
 Stepped

(Approx. #'s)
 Jackhammer # holes: _____
 Core Drill # holes: _____
 Air Drill # holes: _____

Sets:
 Lines W _____ D _____
 Termis W _____ D _____
 Gates W _____ D _____

Special Tools
 Torch
 Welder
 Ladder
 Other: _____

SPECIFIC CONDITIONS MUST BE NOTED. FAILURE TO NOTE SPECIFIC CONDITIONS (HARD DIG, BURIED LINES, ETC) WILL RESULT IN ADDITIONAL CHARGES.
 All hand dug holes \$ _____ per hole. C.I. Line Stake set by buyer. C.I.

Special Instructions: All posts set in concrete.

SLATS		CHAIN LINK GATES											
Color: _____	Type: _____	Style: <u>176</u>	Style: _____										
Pattern: _____		Quantity: _____	Quantity: _____										
		Wt X Ht: <u>40x6'</u>	Wt X Ht: _____										
		Frame Size: <u>176</u>	Frame Size: _____										
		Hinge: _____	Hinge: _____										
		Latch: _____	Latch: _____										
		Closer: _____	Closer: _____										
EXTRA													
		FFC: _____	Cust: _____										
CHAIN LINK FENCE													
Fabric		Line Posts		Rails		Terminals		Barb		Barb			
Footage	Ht	Ga.	Mesh	Space	OD	Ga.	OD	Ga.	T/M/B	OD	Ga.	Wire	Tape
<u>121'</u>	<u>6'</u>	<u>9g</u>	<u>2"</u>	<u>8'</u>	<u>1 1/2"</u>	<u>40</u>	<u>1 1/2"</u>	<u>40</u>	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<u>3 1/2"</u>	<u>40</u>		
									<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>				
ORNAMENTAL IRON, VINYL FENCE, WOOD FENCE or HORSE CORRAL													
Footage	Type	Ht	Line Posts			Pickets			Rail		# of Rails	Panel Width	Color
			Spacing	OD	Ga.	Space	OD	OD	Ga.				
ORNAMENTAL IRON GATES													
Style	Sgt. Ht x W	Dbl. Ht x W	Slide Ht x W	Picket OD	Color	Rail Gauge	Rail OD	Gate Post OD	Latch Type	Hinge Type	Brace & Truss		

TOTAL: \$ 2,676.⁰⁰
 Down Payment: \$ _____
 Check # _____
 BALANCE: \$ _____

By Execution of this document, Buyer acknowledges that he/she has read and understands the terms and conditions set forth and within any attachments. Seller shall not be responsible for any Buyer shall hold harmless Frontier Fence Company from any and all damages or liabilities resulting from any cut or damaged lines including, but not limited to, gas, water, sprinkler, electric, telephone, fiber optic, cable. Buyer shall comply with all applicable statutes and codes relating to the location of utility lines.

This offer guaranteed for 30 days

Accepted by Buyer: _____
 Sales Person: [Signature]
 Approved by Contractor's Manager: _____

Terms: Cash due upon substantial completion.
 LEAVE FENCE SIGNS INTACT FOR WARRANTY TO BE IN EFFECT

FRONTIER FENCE COMPANY, LLC

P.O. Box 1778
Snowflake, AZ 85937
Phone: (928) 536-2950

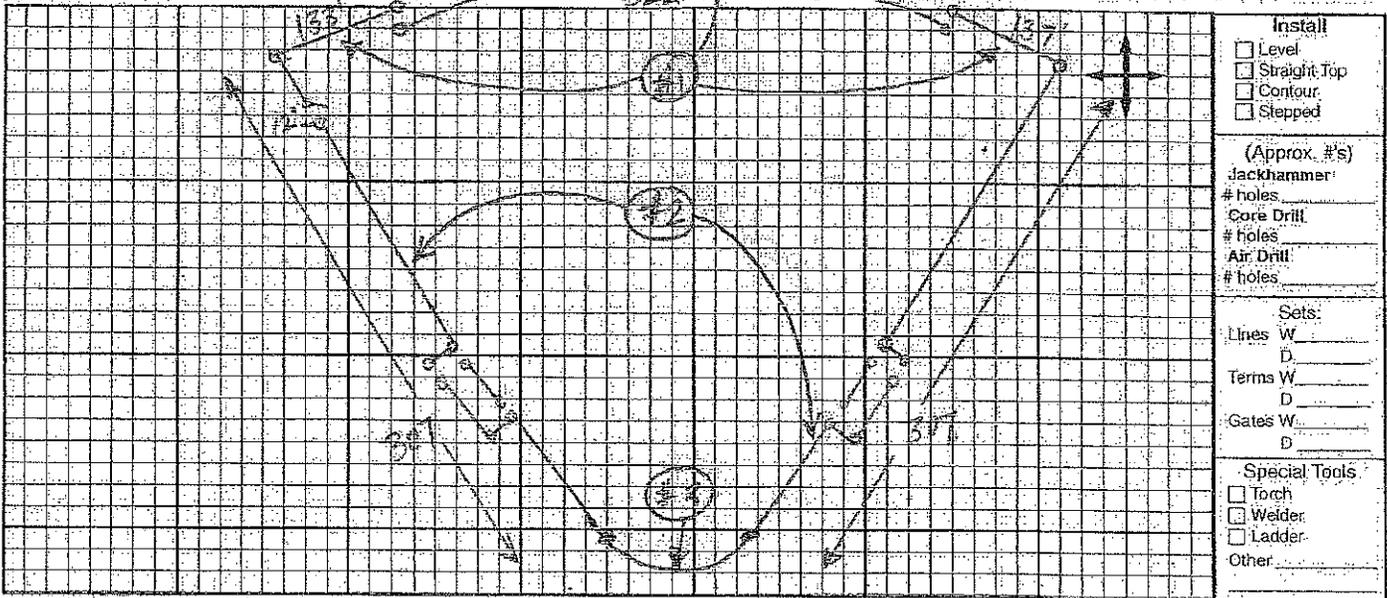
FFCLLC@FrontierFence.com

CONTRACT #

Phone Number	Date: 11/16/12
Mobile Phone #	Fax Number

Arizona Contractor's License # 264088

Proposal To: City of Holbrook
 Job Address: Hunt Park City: Holbrook State: AZ Zip: _____
 Billing Address: _____ State: _____ Zip: _____



Install

Level
 Straight Top
 Contour
 Stepped

(Approx. #'s)
Jackhammer:
 # holes _____
 Core Drill
 # holes _____
 Air Drill
 # holes _____

Sets:
 Lines W _____
 D _____
 Terms W _____
 D _____
 Gates W _____
 D _____

Special Tools
 Torch
 Welder
 Ladder
 Other _____

SPECIFIC CONDITIONS MUST BE NOTED. FAILURE TO NOTE SPECIFIC CONDITIONS (HARD DIG, BURIED LINES, ETC) WILL RESULT IN ADDITIONAL CHARGES.
 All hand dug holes \$ _____ per hole. C.I. Line Stake set by buyer. C. I.

Special Instructions: All old materials will be removed by City
Holbrook will be striped at time & Reprinted. All posts
are set in concrete. Any Dig Sub 40 from Holbrook.

SLATS			CHAIN LINK GATES	
Color _____	Style <u>DRIVE</u>	Quantity _____	Style _____	Quantity _____
Type _____	Wt X Ht <u>12x6</u>	Wt X Ht _____	Wt X Ht _____	Wt X Ht _____
Pattern _____	Frame Size <u>176"</u>	Frame Size _____	Frame Size _____	Frame Size _____
	Hinge _____	Hinge _____	Hinge _____	Hinge _____
	Latch _____	Latch _____	Latch _____	Latch _____
	Closer _____	Closer _____	Closer _____	Closer _____

CHAIN LINK FENCE													
Fabric				Line Posts			Rails			Terminals		Barb	Barb
Footage	Ht.	Ga.	Mesh	Space	OD	Ga.	OD	Ga.	T/M/B	OD	Ga.	Wire	Tape
1204	6'	9/16"	2"	6"	1 7/8"	40	1 5/8"	40	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	376	40		
40'	18"	6.9.9"	2"	<u>existing</u>	<u>same</u>	<u>to be painted by City</u>			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>				

EXTRA		
	FFC	Cust
Trim Trees		
Clear Line		X
Remove Fence		X
Haul Fence		X
Trench		

ORNAMENTAL IRON, VINYL FENCE, WOOD FENCE or HORSE/CORRAL												
Footage	Type	Ht.	Line Posts			Pickets		Rail		# of Rails	Panel Width	Color
			Spacing	OD	Ga.	Space	OD	OD	Ga.			

ORNAMENTAL IRON GATES											
Style	Sgt Ht. x W	Dbt Ht. x W	Slide Ht. x W	Picket OD	Color	Rail Gauge	Rail OD	Gate Post OD	Latch Type	Hinge Type	Brace & Truss

#1 = \$ 8,974.⁰⁰
 #2 = \$ 6,794.⁰⁰
 #3 = \$ 1,654.⁰⁰

TOTAL: \$ _____
 Down Payment: \$ _____
 Check # _____
 BALANCE: \$ _____

By Execution of this document, Buyer acknowledges that he/she has read and understands the terms and conditions set forth and within any attachments. Seller shall not be responsible for any Buyer shall hold harmless Frontier Fence Company from any and all damages or liabilities resulting from any cut or damaged lines including, but not limited to, gas, water, sprinkler, electric, telephone, fiber optic, cable. Buyer shall comply with all applicable statutes and codes relating to the location of utility lines.

This offer guaranteed for 30 days

Accepted by Buyer: _____
 Sales Person: [Signature]
 Approved by Contractor's Manager: _____

Terms: Cash due upon substantial completion. LEAVE FENCE SIGNS INTACT FOR WARRANTY TO BE IN EFFECT.

PROPOSAL



PO Box 3357
Flagstaff, AZ
86003

NORTHERN FENCE COMPANY

Owner - John McNeily
~~2304 E 6th Ave.~~ • Flagstaff, AZ 86004
Cell: (928) 699-3268 Fax: (928) ~~527-8428~~
Flagstaff: (928) ~~225-3803~~
Verde Valley: (928) 634-9211

License Res. - B-109386, Com. L-152669 Bonded/Insured

PROPOSAL SUBMITTED TO <i>City of Holbrook</i>	PHONE	DATE <i>11/15/12</i>
STREET	JOB NAME	20
CITY, STATE and ZIP CODE	JOB LOCATION <i>SULLIVAN D Ci. holbrook. AZ. US</i>	
ARCHITECT <i>Attn: Randy</i>	DATE OF PLANS	JOB PHONE <i>241-0346</i>

We hereby submit specifications and estimates for:

* Bid #1 (Hunt Park - outfield fence) ...
 592' 4/F of 6' Chain-Link Fence as per diagram
 spec's - 2 7/8" End Posts sch. 40, 1 7/8" Line Posts sch. 40, 1 5/8"
 Top rail sch. 40, 9 gauge fabric, 9 ga. Bottom Wire -
 Total = \$ 8425.00
 tax @ .069% = 581.00
 Total w/ Tax = \$ 9006.00

* Bid #2 (Hunt Park - side field(s))
 555' 4/F of 6' Chain-Link Fence as per Diagram
 1 ea 12' x 6' Double Drive Gate
 spec's - same as Bid #1
 Total = 8610.00
 tax @ .069% = 594.00
 Total w/ Tax = \$ 9204.00

We Propose hereby to furnish material and labor - complete in accordance with above specifications, for the sum of:

standard billing dollars (\$ _____)

Payment to be made as follows:

All material is guaranteed to be as specified. All work to be completed in a workmanlike manner according to standard practices. Any alteration or deviation from specifications involving extra costs will be executed only upon written orders, and will become an extra charge over and above the estimate. All agreements contingent upon strikes, accidents or delays beyond our control. Owner to carry fire, tornado and other necessary insurance. Our workers are fully covered by Workman's Compensation Insurance.

Acceptance of Proposal - The above prices, specifications and conditions are satisfactory and are hereby accepted. You are authorized to do the work as specified. Payment will be made as outlined above.

Date of Acceptance: *[Signature]*

Authorized Signature *[Signature]*

Note: This proposal may be withdrawn by us if not accepted within _____ days.

Signature *[Signature]*

Signature _____

PROPOSAL



PO Box 3357
Flagstaff, AZ
86003

NORTHERN FENCE COMPANY

Owner - John McNeily
~~2304 E. 6th Ave.~~ • Flagstaff, AZ 86004
Cell: (928) 699-3268 Fax: (928) ~~527-8428~~
Flagstaff: (928) ~~225-8303~~
Verde Valley: (928) 634-9211

License Res. - B-109386, Com. L-152669 Bonded/Insured

PROPOSAL SUBMITTED TO <i>City of Holbrook</i>	PHONE	DATE <i>11/15/12</i>	20
STREET	JOB NAME		
CITY, STATE and ZIP CODE	JOB LOCATION		
ARCHITECT <i>Attn: Randy Sullivan</i>	DATE OF PLANS <i>11/15/12</i>	241-0346	JOB PHONE

We hereby submit specifications and estimates for:

Bid #3 (Hunt Park Backstop)

*45' LF of New fabric & bottom rail on existing
Frame work: (18' High Bottom 9' is 6 gauge fabric
& Top 9' is 9 gauge fabric*

*Total = \$ 2690.00
tax @ .069% = 186.00
Total w/ tax = \$ 2876.00*

Bid #4 (Lizitsky Park)

*121' LF of 6' chain-link fence as per diagram
1 ea 8' Double Drive gate
spec's - same as bid #1*

*Total = 3460.00
tax @ .069% = 238.00
Total w/ tax = \$ 3698.00*

We Propose hereby to furnish material and labor - complete in accordance with above specifications, for the sum of:

Standard Billing _____ dollars (\$ _____)

Payment to be made as follows:

All material is guaranteed to be as specified. All work to be completed in a workmanlike manner according to standard practices. Any alteration or deviation from specifications involving extra costs will be executed only upon written orders, and will become an extra charge over and above the estimate. All agreements contingent upon strikes, accidents or delays beyond our control. Owner to carry fire, tornado and other necessary insurance. Our workers are fully covered by Workman's Compensation Insurance.

Acceptance of Proposal - The above prices, specifications and conditions are satisfactory and are hereby accepted. You are authorized to do the work as specified. Payment will be made as outlined above.

Date of Acceptance: *11/15/12*

Authorized Signature *John McNeily*

Note: This proposal may be withdrawn by us if not accepted within _____ days.

Signature *[initials]*

Signature _____



Contractor's License # ROC173360, 173361

December 6, 2012

City of Holbrook
Attn: Randy Sullivan

Project: Baseball Fields and Litithy Park

RE: Fence & Gates

Please accept the estimate below

Base Bid Litithy Park \$2,995.00

Provide & install 120 feet of 6' chain link and one 12' double drive gate per specifications

Base Bid Baseball Park Backstop \$ 4,250.00

Provide, hang, & re-stretch the backstop chain link only existing post to be used per specifications.

Base Bid Park Sidelines \$10,700.00

Provide & install 700' of chain link fence and one 12' double drive service gate per specifications.

Base Bid Outfield \$5,800.00

Provide & install 350' of chain link post set at 8' oc per specifications.

Exclusions: Staking, Grading, and Grounding.

Please feel free to call me with any questions at 1-928-537-3333.

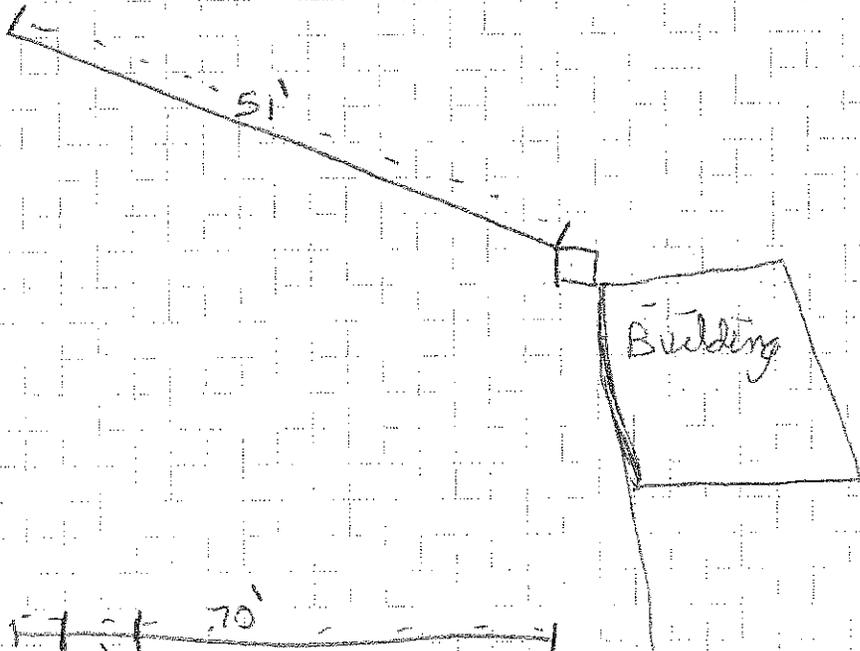
Sincerely,

Bryan Jarman

Bryan Jarman
Project Manager

6' Tall
Timberlands
2/18 40 page

Railroad
1/5/18



Lighting Park

Baseball

Distances for Other Leagues:

Little League:

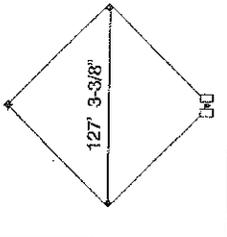
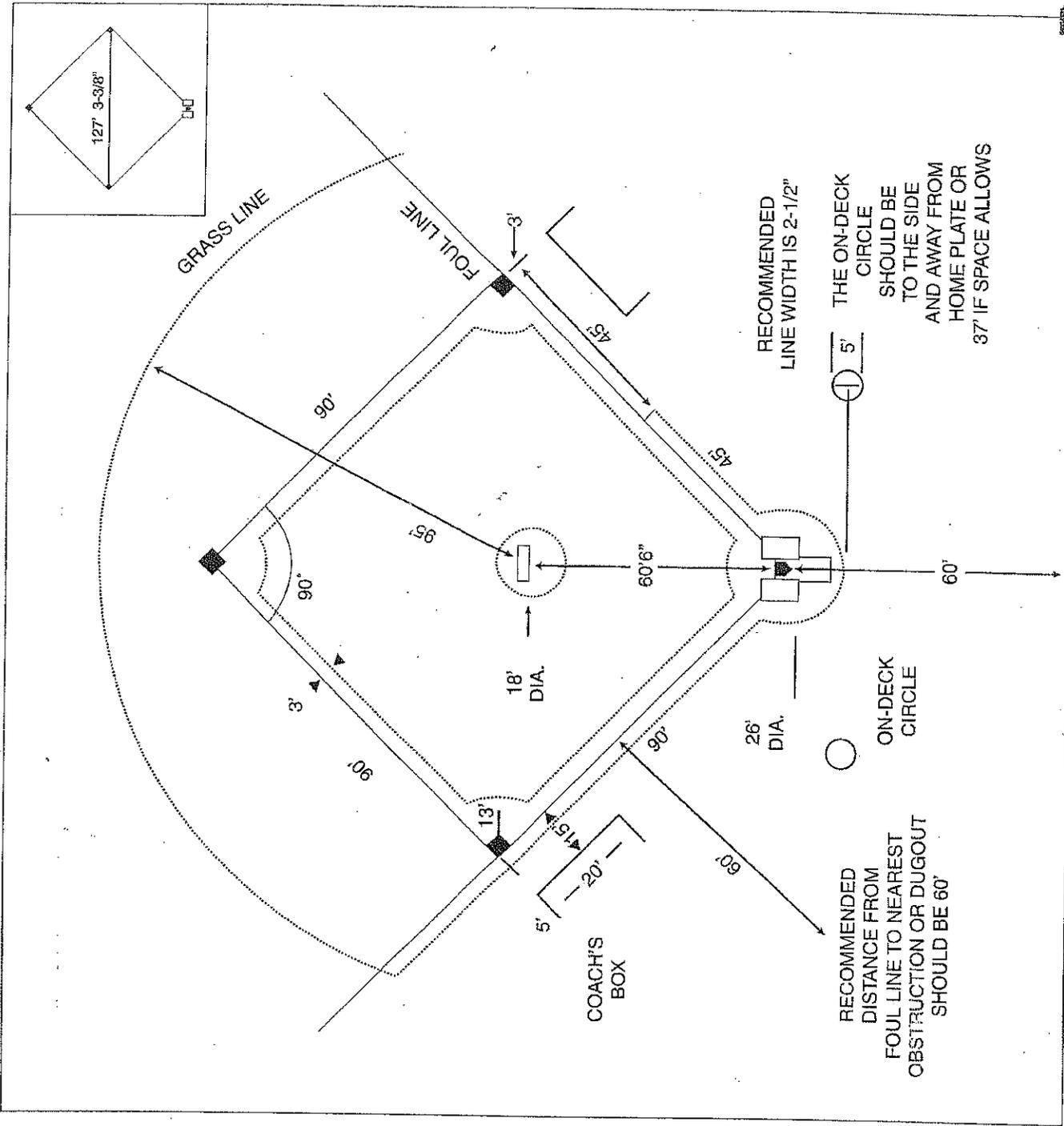
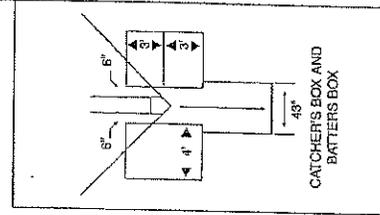
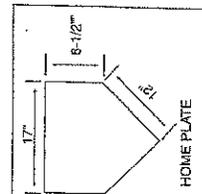
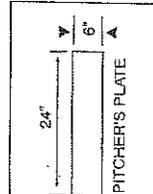
- Base to Base: 60'
- Pitching Rubber to Home Plate: 46'
- Outfield Wall: 180' from Home Plate (opt. 200' left to right)

Pony League:

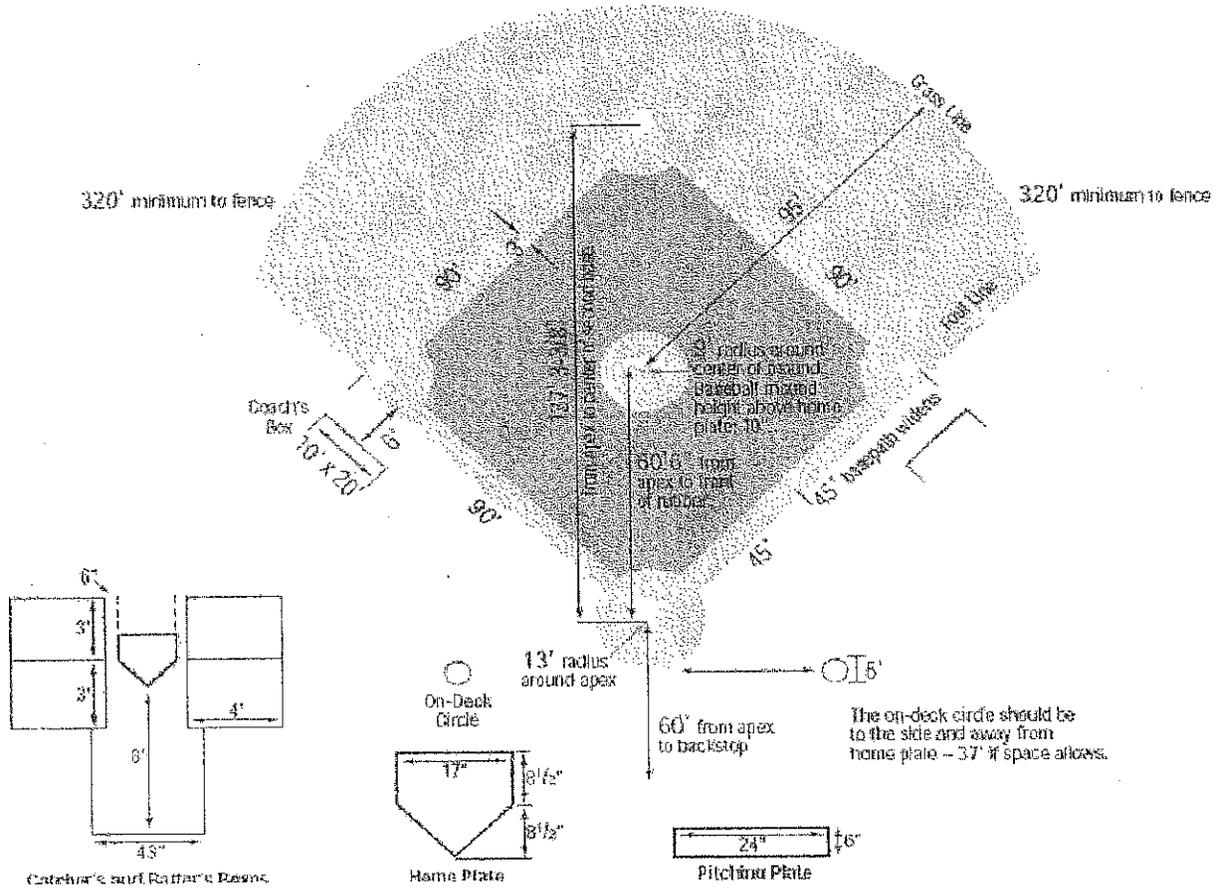
- Base to Base: 80'
- Pitching Rubber to Home Plate: 54'
- Outfield Wall: 250' from Home Plate (opt. 300' left to right)

Babe Ruth League:

- Cal Ripken (ages 5-12):
Bases: 60'
Pitching: 46'
- Baseball (ages 13-15):
Bases: 90'
Pitching: 60'6"
- Baseball (ages 16-18):
Bases: 90'
Pitching: 60'6"



90' Baseball Field



155' 6" to grass line

350 to outfield fence (middle)

ORDINANCE NO. 12--10

AN ORDINANCE OF THE MAYOR AND COUNCIL OF THE CITY OF HOLBROOK, ARIZONA, AMENDING THE CITY CODE, CHAPTER 1, ADMINISTRATION, ARTICLES 1-4, PURCHASING POLICY BY AMENDING SECTION 1-4-2; ESTABLISHING AN EFFECTIVE DATE; AND PROVIDING FOR REPEAL AND SEVERABILITY.

WHEREAS, the Mayor and City Council of the City of Holbrook have considered the purchasing policy; and

WHEREAS, it has been determined that purchasing policy should be amended.

NOW, THEREFORE, BE IT ORDAINED BY THE MAYOR AND COUNCIL OF THE CITY OF HOLBROOK, ARIZONA:

Section 1. AMENDMENT TO ARTICLE 1-4

Chapter 1 of the City of Holbrook City Code, Article 1-4, is hereby amended to read as follows, with deletions shown as strikethroughs, and with added language shown in CAPS and underlined:

1-4-2 Bidding Procedures

When solicitation of bids is requested by the city council, or is required by applicable State law, or if the Purchasing Agent determines that it is in the best interests of the city to solicit bids, the Purchasing Agent shall conduct the bidding procedures in the following manner:

- A. Notice Contents: All notices and solicitation of bids shall state the time and place for opening.
- B. Submission: All bids shall be submitted sealed to the Purchasing Agent and shall be identified as bids on the envelope.
- C. Opening: All bids shall be opened in public at the time and place stated in the public notice.
- D. Tabulation; Posting: A tabulation of all bids received shall be posted in the City Hall for public inspection.
- E. Formal Bids: When the council requests a formal bid, the formal bids shall specifically state the character of the city improvement, purchase or kind of supplies, materials, equipment and services required. Notice shall be published once in the official newspaper, not less than five (5) days prior to the opening of bids. Bidding shall be by sealed proposals only under

regulations prescribed by the council. Council has the right to reject any and all bids, and to advertise for bids again.

- F. Under ~~\$1,000~~ **\$2,500** : Whenever any contemplated purchase or contract for services is for the sum of less than ~~\$1,000~~ **\$2,500**, the purchasing agent may order the item without any further requirements. **THE ITEM OR SERVICE MUST HAVE BEEN BUDGETED AND BUDGET CAPACITY MUST EXIST FOR THE PURCHASE. DUE DILIGENCE MUST BE EXERCISED TO ENSURE THE BEST POSSIBLE PRICING. THE PURCHASE MUST NOT BE ARTIFICIALLY PLANNED, DIVIDED OR FRAGMENTED TO CIRCUMVENT THE COMPETITIVE BID PROCESS. A PURCHASE REQUISITION/ PURCHASE ORDER MUST BE SIGNED BY THE FINANCE DIRECTOR AND/OR CITY MANAGER AUTHORIZING THE PURCHASING AGENT TO PROCEED WITH THE PURCHASE.**
- G. ~~\$1,000 to \$4,999~~ **\$2,501 to \$4,999** Inclusive: Whenever any contemplated purchase or contract for services is for the sum of at least ~~\$1,000~~ **\$2,501** but not more than ~~\$4,999~~, the purchasing agent Department Manager shall solicit **AT LEAST** three (3) bids for the item or service. The bids may be orally obtained and **THE BIDS PROVIDED TO** the purchasing agent. **THE PURCHASE AGENT** may then award the purchase or contract to the lowest responsible bidder. **THE ITEM OR SERVICE MUST HAVE BEEN BUDGETED AND BUDGET CAPACITY MUST EXIST FOR THE PURCHASE. DUE DILIGENCE MUST BE EXERCISED TO ENSURE THE BEST POSSIBLE PRICING. THE PURCHASE MUST NOT BE ARTIFICIALLY PLANNED, DIVIDED OR FRAGMENTED TO CIRCUMVENT THE COMPETITIVE BID PROCESS. A PURCHASE REQUISITION/ PURCHASE ORDER MUST BE SIGNED BY THE FINANCE DIRECTOR AND/OR CITY MANAGER AUTHORIZING THE PURCHASING AGENT TO PROCEED WITH THE PURCHASE.**
- H. ~~\$5,000 to \$14999~~ to Inclusive: Whenever any contemplated purchase or contract for services is for the sum of at least \$5,000 but less than \$14,999, the purchasing agent shall solicit at least three (3) written bids for the item or service on bid forms. No contract or purchase of \$5,000 or more shall be approved except by the council. The purchasing agent shall present to the council any contemplated purchase or contract for \$5,000 or more for approval and advise the council of the advantages and disadvantages of the bid proposal.
- I. ~~\$15,000 and Over~~: Whenever any contemplated purchase or contract for services is for the sum of \$15,000 or more, the purchasing agent shall cause to be published once in the official newspaper a notice inviting bids, which notice shall be published not less than five (5) days prior to the

opening of bids.¹ The notice herein required shall include a general description of the articles to be purchased or services to be performed and the time and place for the opening of bids. In addition, the purchasing agent shall post a notice inviting bids at the City Hall and shall provide notice by mail to any responsible prospective local suppliers known to the purchasing agent. No contract or purchase of ~~\$5,000~~ **\$15,000** or more shall be approved except by the council. The purchasing agent shall present to the council any contemplated purchase or contract for **\$15,000** or more for approval and advise the council of the advantages and disadvantages of the bid proposal.

Section 2. EFFECTIVE DATE

The effective date of this ordinance is _____, 2012.

Section 3. REPEALING CLAUSE

All ordinances or parts of ordinances in conflict with the provisions of this ordinance are hereby repealed, effective as of the date of posting hereof.

Section 4. SEVERABILITY

If any section, subsection, sentence, clause, phrase or portion of this ordinance is for any reason held to be invalid or unconstitutional by the decision of any court of competent jurisdiction, such decision shall not affect the validity of the remaining portions thereof.

PASSED AND APPROVED by the Mayor and Council of the City of Holbrook, Arizona, this _____ day of _____, 2012.

Jeff Hill, Mayor

APPROVED AS TO FORM:

¹See City Charter Section 8.03

ATTEST:

Cher Reyes, , CMC, CPM, City Clerk

Marlene A. Pontrelli, Esq.
Mariscal, Weeks, McIntyre &
Friedlander, P.A., City Attorneys