

ADDENDUM NO. 1

TO: ALL PLAN HOLDERS

RE: Jims Bayou WWTP Rehabilitation – City of Linden, Texas

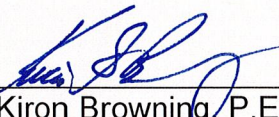
ADDENDUM DATE: January 30, 2023

The Plans, Specifications and Contract Documents for the above referenced project are hereby modified as follows:

1. **Notice to Bidders-Bid Date: Remove and Replace Notice to Bidders with the attached Notice to Bidders.**
2. **Technical Specifications- Remove the Existing Attachment B Section 11372 Rotary Positive Displacement Blowers with the attached Section 11372.**

ADDENDUM NO.1 ISSUED BY:

A.L. FRANKS ENGINEERING


Kiron Browning, P.E.
Project Manager



NOTICE TO BIDDERS OF THE INTENTION OF THE CITY OF LINDEN, TX TO LET CONTRACT FOR REHABILITATION OF JIMS BAYOU WWTP.

SEALED BIDS addressed to Lee Elliot, City Administrator, City of Linden, Texas, 104 S. Main St., Linden, Texas 75563, will be received until **2:00 P.M., Tuesday, February 14, 2023** for furnishing all labor, equipment, materials, supplies, and supervision necessary for the:

JIMS BAYOU WWTP REHABILITATION

Bids will be opened and read aloud at such time at city hall, Linden, Texas.

The bid package may be examined without charge Linden City Hall, 104 S. Main St., Linden, Texas 75563 or at the office of A.L. Franks Engineering, 118 East Broad Street, Texarkana, AR 71854. One copy of each set of documents may be purchased from A.L. Franks Engineering for \$100.00. Documents may be ordered at www.alfranksengineering.com. **No refunds will be made.**

Engineer: A.L. Franks Engineering, Inc.
Kiron S. Browning, P.E.
118 E. Broad Street
Texarkana, AR 71854
Phone: (870) 216-1906
Fax: (870) 216-1907
Email: kbrowning@alfranksengineering.com

A CERTIFIED OR CASHIER'S CHECK, or an acceptable bid bond in an amount not less than five percent (5) of the total bid shall accompany each bid as a guaranty that, if awarded the contract, the bidder will promptly enter into contract with the City of Linden, Texas and furnish bonds on the forms provided.

THE SUCCESSFUL BIDDER OR BIDDERS will be required to furnish a Performance and Payment Bond, each in the amount of the contract, written by a responsible surety company authorized to do business in the State of Texas, and satisfactory to the Owner as required by Article 5160, V.A.T.C.S.

BIDDERS ARE expected to inspect the site of the work and to inform themselves of all local conditions. The time of completion shall be **75 days**.

NO BID may be withdrawn after the scheduled closing time for receipt of bids for at least 90 calendar days.

IN CASE of ambiguity or lack of clearness stating the price in the bids, the City of Linden, Texas reserves the right to consider the most advantageous construction thereof, or to reject the bid.

THE CITY OF LINDEN, TEXAS reserves the right to reject any or all bids, waive any or all informalities, and to award the contract to the bidder or bidders who, in the opinion of the Owner, offers the proposal to the best interest of same.

CONTRACTORS are cautioned that qualified bids will be subject to rejection.

CONTRACTORS are specifically advised that any person, firm, or other party to whom it is proposed to award a subcontract under this contract must be acceptable to the Owner.

City of Linden, Texas

Lee Elliott, City Administrator

SECTION 11372

ROTARY POSITIVE DISPLACEMENT BLOWERS

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required and install complete, ready for operation and field-test new rotary positive displacement blowers and appurtenances, as shown on the Drawings and as specified herein.
- B. The entire blower package and its components shall comply with all applicable safety and environmental regulations.

1.02 RELATED WORK

- A. Electrical work, except as otherwise specified herein, is included in Division 16000.

1.03 SUBMITTALS

- A. Submit copies of all materials required to establish compliance with this Section. Submittals shall include at least the following information:
 - 1. Certified general arrangement drawings showing materials, details of construction, dimensions, and connections.
 - 2. Complete Blower Performance Data including:
 - a. RPM
 - b. Capacity – scfm and icfm
 - c. Discharge pressure
 - d. dB(A) noise pressure level
 - e. Maximum gear tip speed and rotor tip speed (fpm)
 - f. HP required at rated capacity and pressure
 - g. Rated maximum pressure rise of blowers
 - 3. List of recommended spare parts broken down into on hand parts and long term for 2 years operation and 3 to 5 years operation.
 - 4. Descriptive Brochures
 - 5. Performance Curves
 - 6. Motor Data
 - 7. Valves
 - 8. ISO-1217 Performance Test Results Slip test results are unacceptable as an alternate. Manufacturer must provide documented results for the purchased machines. Typical or average data is not acceptable.
 - 9. Declaration of Conformity, per Machinery Directive 2006/42/EC, Annex II, No.1 A.
- B. Complete blower package operating and maintenance instructions professionally published, hard copy and electronic copy, shall be furnished for all equipment included under these specifications in accordance with Section ?????.

1.04 QUALITY ASSURANCE

A. Qualifications

1. Package shall be Aerzen Generation 5 Delta Blower Model GM 10 S DN 80. Regardless of manufacturer, the package will be produced by the manufacturer of the blower stage, to ensure single source responsibility for blower performance and compatibility of associated accessories. Packagers not permitted to bid.
2. The equipment shall be designed, constructed, and installed in accordance with the best practices and methods and shall operate satisfactorily when installed as shown on the Drawings.
3. The blower(s) shall be covered by a warranty for 24 months from date of commissioning, or a maximum of 30 months from date of shipment.
4. The performance data and manufacturing methods shall achieve a Declaration of Conformity, per Machinery Directive 2006/42/EC, Annex II, No.1 A.

1.05 BLOWER PERFORMANCE CRITERIA

- | | |
|---------------------------------|-----------------------------|
| 1. Quantity of Machines | 2 |
| 2. Design Inlet Temperature | 100 °F |
| 3. Site Elevation | 290 feet above sea level |
| 4. Design Inlet Pressure | 14.5 psia |
| 5. Design Relative Humidity (%) | 80 % |
| 6. Design Flow | 240 scfm per machine |
| 7. Design Discharge Pressure | 7.1 psig |
| 8. Maximum Blower Speed | 1800 RPM @ 92.4% of maximum |
| 9. Motor Size (Max) | 15 Hp |

(1) Package BHP to include pressure loss through a clean inlet filter / silencer, pressure loss of the exhaust silencer and check valve.

(2) Package Performance shall be guaranteed to ISO 1217 with a tolerance is +/- 5% on volume flow and +/- 5% on package horsepower. Manufacturer of blower must provide data for purchased machine.

(3) Sound data shall be from an ISO 2151 method of measurement, in an ISO 3745 qualified test facility. Sound data shall be compliant with a Declaration of Conformity assessment standard.

1.06 DELIVERY, STORAGE AND HANDLING

- A. All equipment shall be completely factory assembled, skid mounted, crated, and delivered to protect against damage during shipment.
- B. All exposed flanges shall be covered and sealed with shrink-wrap to prevent the entrance of moisture. Finished iron or steel surfaces not painted shall be properly protected to prevent rust and corrosion.
- C. All equipment delivered to the site shall be stored as specified in accordance with the manufacturer's instructions.

1.07 MAINTENANCE

A. Spare Parts

1. Furnish the following spare parts for each blower package specified:
 - a. Complete set of matched V-belts
 - b. One filter element
 - c. Volume of oil change for first service interval
2. Spare parts shall be properly bound and labeled for easy identification without opening the packaging.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Blower packages shall be designed to minimize the life-cycle costs and maximize plant reliability. The design and the selection of the components shall be based on a minimum useful life of 15 years and a Mean Time Between Overhauls of 5 years of continuous operation. Bearing life must be submitted by manufacturer of service life, based on specified conditions.
- B. No special foundations shall be required. The blower packages will be installed directly on a concrete slab without grouting the base frame. There shall only be 4 easily accessible anchor points.
- C. Blower Casing:
 1. The blower casing shall be of one-piece construction, with separate sideplates that are bolted and pinned to the housing.
 2. Materials shall be close-grained cast iron ASTM A48 suitably ribbed to prevent distortion under the specified operating conditions.
 3. Minimum blower casing pressure rating shall be 36 psig.
 4. Inlet and outlet shall be flanged connections.
 5. The casing shall incorporate a proven means of pulsation cancellation which achieves 90% of better reduction in vibration. Systems without a means of pulsation cancellation shall not be accepted.
 6. The vibration level as measured at the blower casing, in the X/Y planes of the bearings, shall not exceed $\frac{1}{2}$ "/sec RMS when operating at the specified maximum operating pressure and speed in the actual blower package.
- D. Factory Testing:
 - a. Each blower stage shall be factory tested in accordance with ISO 1217 performance test to verify flow and brake horsepower at blower maximum conditions. A slip test shall not be acceptable, nor is average data for the manufactured size.
 - b. The acceptance criteria are +5% tolerance on power and -5% tolerance on flow regardless of the size of the machine.
- E. Rotors:
 1. Each rotor shall be of the "stiff" design with first lateral critical speed at least 120% of the maximum allowable operating speed.

2. The rotors shall be of the straight, three-lobe type, and shall operate without rubbing or liquid seals or lubrication.
 3. Rotor/shaft shall be one single piece. Cast, hollow rotors shall be capped, dust tight. Open rotors are not acceptable.
 4. The rotors shall be statically and dynamically balanced per ISO1940/ANSI S2.19 G6.3.
- F. Bearings:
1. Each rotor/shaft shall be supported by anti-friction bearings and fixed to control the axial location of the rotor/shaft in the unit.
 2. Regardless of theoretical bearing life calculations, the bearings shall be sized for a minimum expected life of 5 years between overhauls. Calculated bearing life shall be submitted, based on specified operating conditions.
- G. Timing Gears:
1. The rotors shall be timed by a pair of single helical AGMA 12 quality gears with hardened and ground teeth; minimum AGMA service factor of 1.70. Spur cut gears are unacceptable
 2. Gears shall be mounted on the shafts with a tapered interference fit and secured by a locknut. Pinned gears are unacceptable.
- H. Seals:
1. Seal shall be designed to prevent lubricant from leaking into the air stream as well as to prevent oil from leaking out of the machine.
 2. Four rotary piston ring shaft seals, an oil slinger and an O-ring seal shall be provided at the point where the shaft passes through the sideplates.
 3. Further provision shall be made to vent the rotor side of the oil seal to atmosphere to eliminate any possible carry-over of lubricant into the air stream.
- I. Lubrication:
1. The timing gears and the bearings shall be splash lubricated. Grease lubrication shall be not acceptable.
- J. Oil Sight Glass:
1. A recessed oil sight glass must be provided on each oil sump.
 2. Protruding sight glasses shall not be acceptable.
- K. Painting:
1. Painting shall be per supplier's standard meeting the following criteria:
 - a. Except for machined sealing and machined mounting surfaces, the package shall be painted dark blue.
 - b. Aluminum, stainless steel, and brass shall not be painted.
 - c. The supplied motor shall not be over sprayed and will be supplied with the motor manufacturer's standard protection and paint color.
 - d. Painted Cast Iron and Carbon Steel shall be Alkyd Resin Primer and Final coat with a total dry film thickness of 70µm. Surface preparation SSPC10 or better.
 - e. Sound enclosure shall be powder-coated polyester base total dry film thickness 80µm.

- f. Galvanized components shall only be painted with appropriate surface preparation

2.02 BLOWER ACCESSORIES

A. Inlet Filter / Silencer:

1. Each package shall be supplied with one combination inlet filter silencer.
2. The inlet filter silencer shall be mounted directly to the inlet flange of the blower.
3. The filter media efficiency must meet the requirements of ASHRAE 52.2 MERV7 50-70% @3-10 microns corresponding to EN779 G4.
4. The silencer portion shall be located upstream of the inlet filter.
5. Filter and silencer performance losses shall be included in the blower performance calculation.
6. The filter element shall be designed to trap dirt on the inside so that upon changing, dirt does not fall into the machinery. Filters where dirt accumulates on the external surface of the filter will not be permitted.

B. Base Frame / Discharge Silencer:

1. Each package shall be supplied with one combination base frame / discharge silencer.
2. The silencer shall be a chamber type design for maximum sound attenuation and shall not use fibrous or absorption materials of any kind. Internal absorption material has been shown to degrade and internally foul diffusers and will not be permitted.
3. The silencer shall be fabricated of a single shell of pressure vessel quality steel with continuous welds.
4. The silencer shall be subject to a pressure test for tightness and strength at a minimum of 1.65 times the maximum blower operating pressure.
5. The silencer shall have a machined inlet connection where the discharge flange of the blower stage bolts directly to, with no intermediary pieces. Threaded connection between the compressor stage and the discharge silencer is subject to leakage and misalignment and will not be permitted.
6. Discharge silencer performance losses shall be included by the blower vendor in the blower performance calculation. This is another reason why the blower accessories must be supplied by the manufacturer of the blower stage.
7. The base frame shall be constructed from welded carbon steel or cast iron that shall be designed to maintain alignment of the blower internal components and the drive during operation.
8. The base frame shall be designed to resist distortion while being installed on vibration isolating mounts.
9. The blower manufacturer shall supply a stainless-steel grounding lug fully welded to the base.

C. Flexible Connectors:

1. Each package shall be connected to the plant piping via flexible connector(s) located downstream of the discharge silencer.

2. Flexible connectors shall prevent the transmission of noise and vibrations from the blower package into the piping.
 3. Flexible discharge connectors shall be a silicone rubber type pipe sleeve with stainless steel hose clamps, rated for 356 °F at 17.4 psig.
 4. Flexible discharge connectors shall be Proco Style 240, Type EE, EPDM, with a standard ANSI flange discharge connection, rated for 300 °F at 20 psig.
 5. Flexible discharge connectors shall be Proco Type KK, Silicone, with a standard ANSI flange discharge connection, rated for 392 °F at 25 psig.
- D. Electric Motor:
1. Each package shall be supplied with a WEG manufactured TEFC motor that shall operate on 460 Volts, 3 Phase, 60 Hertz current, 1800 /3600 RPM.
 - a. Torque NEMA B
 - b. Temperature Rise Class B
 - c. Dust tight enclosures (Severe Duty)
 - d. Class F inverter rated insulation with Class H applied varnish
 - e. 3:1 constant torque
 - f. All cast iron construction, including frame, end bells, conduit box and fan cover
 - g. NPT threaded and gasketed F3 top mounted conduit box
 - h. Copper windings
 - i. Regreasable bearings, positive pressure lubrication system with automatic drawn plugs – pressure compensated (Frame sizes 254T and larger).
 2. All frame sizes shall be NEMA standard, suitable for overhung belt drive and with the conduit box location on top of the motor. IEC frame motors shall not be allowed.
 3. The motor shall be mounted on a pivoting base to provide automatic tensioning of the belts.
 4. The motor nominal rating after any corrections for ambient conditions shall be 10% above the maximum operating bHp.
 5. The motor shall have a 1.15 service factor.
 6. Motor windings shall be supplied with a normally closed thermostat, one per phase, wired in series to form a fail-safe motor protection circuit for the external fault circuit of the motor controller.
 7. Motors shall be equipped with an Aegis ring and insulated NDE bearing to mitigate the effects of stray motor currents.
 8. Blower manufacturer shall be responsible for coordinating the starting torque requirement of the blower and the motor.
- E. Start Unloading Valve:
1. The blower package when started with a “wye-delta” or “soft/reduced start” starter shall include an unloaded start valve that is mounted between the blower and the discharge check valve.
 2. Should an unloading valve be required, the blower manufacturer shall supply it.
 3. Unloading valve shall be an automatic-type mechanically operated valve requiring no electrical connections mounted upstream of the check valve.

F. V-Belt Drive:

1. Each package shall be supplied with a V-belt drive that shall be of the high-capacity type, oil and heat resistant. Drive shall be designed for a minimum service factor of 1.4 times operating power (bHp), or 1.1 times the motor nameplate Hp, whichever is larger to allow a minimum of 1.4-service factor based on the maximum blower bHp.
2. Belt tensioning shall be automatic without the use of any devices or interaction on the part of the operator. Neither slide rails nor load-adjusting springs shall be used.
3. Sheaves shall be dynamically balanced regardless of the operating speed.

G. Belt Guard:

1. The belt drive shall be guarded in compliance with OSHA regulations.
2. Portions of the guard shall be easily removable allowing for belt inspection and replacement.
3. Guard material shall be perforated carbon steel.

H. Vibration Isolators:

1. Each package shall be supplied with vibration isolating feet with a minimum efficiency of 80%.
2. Blower manufacture shall be responsible for attenuating noise and vibration in the blower package such that no special installation base shall be required, nor shall any additional measures be required to reduce vibrations from the blower package being transmitted to the base or the piping.

I. Pressure Safety Valve:

1. Each package shall be supplied with a single pressure safety valve on the discharge side of the blower mounted downstream of the discharge silencer and upstream of the check valve.
2. The safety valve shall be set to protect the blower from exceeding its maximum pressure rating and shall be sized to pass 100% of the design flow.
3. The safety valve shall be field adjustable, spring loaded, and have a certificate of conformity to PED.
4. The valve shall be manufactured by Aerzen.

J. Check Valve:

1. Each package shall be supplied with one check valve that shall be installed on the discharge line.
2. The check valve shall be of the full-bore low pressure-drop, flapper type design with a steel body, and steel flap embedded in EPDM with full-contact seal.
3. The valve shall be removable without disturbing the piping. Pressure losses produced by the check valve shall be included in the blower performance calculation. Check valves requiring installation in the discharge piping shall not be considered unless installation cost of the external valve is included in supplier's proposal.
4. The valve shall be manufactured by Aerzen.

K. Instrumentation:

1. Each package shall be supplied with the following instrumentation:

- a. Inlet Vacuum Gauge (4" Gauges)
 - i. Aerzen standard gauge with 4" dial and scale from 0 to –40 inches of water column.
 - ii. Gauge to function as a filter maintenance indicator.
- b. Inlet Vacuum Gauge (2-1/2" Gauges)
 - i. Wika model 611.10 with 2 1/2" dial and scale from 0 to –60 mbar.
 - ii. Gauge to function as a filter maintenance indicator.
- c. Inlet Vacuum Switch
 - i. Ashcroft Model B4-64-B-XFS-XBP
 - ii. Type 400 pressure Switch in NEMA 4X enclosure
 - iii. DUAL general purpose 15A, 110-480V switches (2) SPDT snap-acting, NOT independently adjustable
 - iv. Buna-N Actuator Seal
 - v. Factory set (-20-inches H2O, decreasing)
 - vi. Mounting bracket
 - vii. Operating range of -30 to +30-inches H2O.
- d. Discharge Pressure Gauge (4" Gauges)
 - i. Aerzen model 32-0053-02 with 4" dial and scale from 0 to 20 psig.
 - ii. The pressure gauge shall have a stainless-steel case.
 - iii. Gauge shall be dry (no fill) with no pulsation snubber required.
- e. Discharge Pressure Gauge (2-1/2" Gauges)
 - i. Wika model 213.40 with 2 1/2" dial and scale from 0 to 23 psig.
 - ii. The pressure gauge shall have a forged brass case and be glycerin-filled for pulsation dampening.
 - iii. A pulsation snubber shall be provided.
- f. Discharge Pressure Switch
 - i. Ashcroft Model B4-24-V-XRN-XJK-15 PSI
 - ii. Type 400 pressure Switch in NEMA 4X enclosure
 - iii. Single general purpose 15A, 110-480V switches (2) SPDT snap-acting, NOT independently adjustable
 - iv. Viton Actuator Seal
 - v. Internal range scale and operating range of 0 to 15 PSIG.
- g. Discharge Temperature Gauge / Switch (4" Gauges)
 - i. Aerzen standard gauge with 4" dial and scale from 32°F to 397°F
 - ii. NEMA 4 enclosure, 5A @ 250volt, SA 28 SPDT microswitch
 - iii. UL & CSA approved.
- h. Discharge Temperature Gauge / Switch (2-1/2" Gauges)
 - i. Wika type SC15608S205-0 with 2 1/2" dial and scale from 32°F to 397°F

- ii. NEMA 4 enclosure, 5A @ 250volt, SA 28 SPDT microswitch
 - iii. UL & CSA approved.
- i. E-Stop Switch
 - i. Siemens model 52PX2V2
 - ii. Mounted on the face of the blower enclosure
 - iii. NEMA 4X rating
 - iv. Two (2) normally closed contacts
- j. Terminal Strip
 - i. The switches and motor thermostat shall be prewired to a labeled terminal junction box inside the blower enclosure.
- L. Each blower shall receive its initial oil filling at the factory, the synthetic oil shall be rated for a minimum of 16,000 hrs.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. The Manufacturer shall conduct a coordination conference call with the Contractor and Design Engineer to review the integration and installation requirements of the equipment after the Submittal documentation has been approved and prior to installation of the equipment.
- B. The Contractor shall install the blowers in accordance with the Manufacturer's written instructions.
- C. The Contractor shall make all electrical and process connections to the blower package prior to the arrival of the manufacturer's representative.
- D. The Contractor shall complete and return the Manufacturer's installation check list prior to having a Manufacturer's representative come onsite.
- E. Representatives of the blower manufacturer shall verify and adjust blower and motor alignment.

3.02 FIELD TESTING

- A. After installation of all equipment has been completed and as soon as conditions permit, the manufacturer shall provide **1 trip** for a total of **2 - 8-hour** days to verify the installation and conduct an acceptance test under actual operating conditions.
 - 1. The Manufacturer shall perform a physical check of the blower installation, perform safety checks, power up the equipment and perform functional testing.
 - 2. The functional test shall consist of 4 hours of operation of each blower with vibration, temperature, and pressure readings as well as motor amp readings taken and recorded at 60-minute intervals.
 - 3. Installed noise measurements shall be taken to compare the installed noise values with the factory free field ISO 2151 measurements.
 - 4. The Manufacturer shall provide operations and maintenance training to the plant personnel. The training shall consist of 1 hour of classroom training using the Operation and Maintenance Manual for reference and 2 hours of hands-on training at the blower package.

- B. If required, Contractor shall make any changes, at his own expense, to the installation that may be necessary to assure satisfactory operation. Contractor shall be held liable for changes needed in the installation.
- C. Manufacturer shall provide a written field test / start up report after completion of testing.
- D. Within one (1) year of startup, the manufacturer shall provide one (1) trip for a total of 1-8-hour days for post startup inspection of the equipment and additional training.

END OF SECTION