FORT VALLEY UTILITY COMMISSION

P.O. BOX 1529 • FORT VALLEY, GEORGIA 31030-1529
(478)825-7701 • FAX(478) 825-7704 • www.fvutil.com

REQUEST FOR BIDS

SLUDGE DEWATERING SCREW PRESS

SECTION 1 – GENERAL INFORMATION

1.1 Introduction

The Fort Valley Utility Commission Wastewater Department is seeking bids from qualified manufactures and/or distributors for the purchase of a sludge dewatering screw press.

1.2 Proposal Inquiries and Submittal

Request for Request for Bids (RFB) packets shall be directed to Fort Valley Utility Commission, Keith Spillers Wastewater Superintendent, 500 Anthoine Street Fort Valley GA 31030.

Keith Spillers shall be the contact person for the respondents to this RFB, email kspillers@fvutil.com or phone (478) 825-7701 ex 217. The contact person shall arrange for any other Utility Commission personnel or consultants to respond to questions as needed.

Three (3) copies of the proposal shall be received by the contact person at The Fort Valley Utility Commission no later than ***2:00 P.M. on January 12, 2023***. Bids submitted by facsimile or email will not be accepted. Mailed or hand delivered bid proposals submitted after this time shall not be accepted. The proposals shall be addressed to:

Proposal for Sludge Dewatering Screw Press
Fort Valley Utility Commission – Wastewater Department
Attn: Keith Spillers, Wastewater Superintendent
500 Anthoine Street
Fort Valley GA, 31030

All bids become part of the public file for the project, without obligation to The Fort Valley Utility Commission. The Fort Valley Utility Commission reserves the right to reject any or all submittals for good cause, in the public interest, and is not liable for any costs incurred in the proposal preparation or presentation.

SECTION 2 – SCOPE OF WORK

2.1 Scope

A. Manufacturer shall furnish and verify installation of one (1) skid mounted sludge dewatering screw press. The screw press shall be manufactured from AISI 304L stainless steel shapes. Fabrication and assembly shall be in conformance with the product specifications and drawings.

B. Manufacturer shall furnish a complete dewatering system including skid, screw press, drive motors, gear reducers, support legs, anchor bolts, polymer station, piping and wiring, controls, and all accessories and appurtenances specified or otherwise required for a complete and properly operation installation.

C. Owner/Owner's Designee shall coordinate all the details of the equipment with other related parts of the work and shall verify that all structures, piping, wiring, and equipment components are compatible. Owner/Owner's Designee shall be responsible for all structural and other alterations required to accommodate equipment differing in dimensions or other characteristics from these specifications and drawings.

D. Equipment will be installed according to instructions and recommendations of the equipment manufacturer.

E. Power supply for main control panel is 460 Volts, 60Hz, 3-phase. The polymer make-down system needs a separate 120 VAC, 60 Hz, single phase power supply.

2.2 References

A. American Society for Testing and Materials (ASTM) Publications:

1. Section A322: Carbon Alloy Steel Bar Specifications.

2. Section A507-10: Standard Specification for Drawing Alloy Steel, Sheet and Strip, Hot-Rolled and Cold Rolled

B. Anti-Friction Bearing Manufacturers Association (AFBMA) Publications:

1. Standard 9-90 Load Ratings and Fatigue Life for Ball Bearings.

2. Standard 11-90 Load Ratings and Fatigue Life for Roller Bearings.

C. American Institute of Steel Construction (AISC) Publications

D. American Welding Society (AWS) Publications

E. American Structures Painting Council (ASPC) Publications

2.3 Submittals

The following information shall be submitted to the Wastewater Treatment Superintendent. Submittals shall include the following:

A. Product Data:

1. Descriptive literature, brochures, catalogs, cut sheets and other detailed descriptive material of the equipment.
2. Motor characteristics and performance information.
3. Gear reducer data including service factor, efficiency, torque rating, and materials.

4. Parts list including a list of recommended spare parts.

B. Shop Drawings: Include the following:

1. Manufacturer's installation drawings.
2. Wiring and schematic diagrams.

C. Operations and maintenance manual.

D. Detailed installation instructions, with clear step-by-step points on the correct mechanical and electrical installation procedures.

E. Equipment weights and lifting points.

F. Recommendations for short- and long-term storage.

G. A copy of the manufacturer's warranty.

H. Failure to include all drawings applicable to the equipment specified in this section will result in rejection of the entire submittal with no further review.

2.4 Quality Assurance

A. To ensure quality, conformance, and reliability regarding the manufacturing and production of the machinery described in this section, the equipment manufacturer shall meet the requirements listed in this section.

B. All stainless-steel components and structures shall be submersed in a chemical bath of nitric acid and hydrofluoric acid (pickling bath) to remove ant residue that may be present on the material as a result of forming, manufacture, or handling. After removal from the pickling bath, the equipment must be washed with a high-pressure wash of cold water to remove any remaining surface debris and promote the formation of an oxidized passive layer which is critical to the long life of the stainless steel. No stainless-steel components may be fabricated or assembled in a factory where carbon steel products are also fabricated, in order to prevent contamination by rust.

C. Screw Press shall be manufacturer's standard product and only be modified as necessary to comply with the drawings, specifications, and specified service conditions.

D. All welding is performed in accordance with American Welding Society (AWS) D1.1 Structural Welding Code, or equivalent.

E. Manufacturer shall provide screw press, polymer system, motors, gear reducers, controls, control panels, and lifting attachments as a complete integrated package to ensure proper coordination, compatibility, and operation of the system.

F. Manufacturer shall provide services by a factory-trained service engineer, specifically trained on the type of equipment specified. Engineer requirements include, but are not limited to the following:

1. Service engineer shall be present during the initial energizing of equipment to determine directional testing.

2. Service engineer shall inspect and verify location of anchor bolts, placement, leveling, alignment and field erection of equipment, as well as control panel operation and electrical connections.

3. Service engineer shall provide classroom and/or field training on the operation and maintenance of the equipment to operator personnel.

4. Manufacturer shall state field service rates for a service engineer to owner. In the event that the field service time required by this section should not be sufficient to properly place the equipment into operation, additional time shall be purchased to correct deficiencies in installation, equipment, or material without additional cost to owner.

G. Manufacturer shall guarantee all equipment against faulty or inadequate design, improper assembly or installation, defective workmanship or materials, and breakage or other failure. Materials shall be suitable for service conditions.

H. All equipment shall be designed, fabricated, and assembled in accordance with recognized and acceptable engineering and shop practice. Individual parts shall be manufactured to standard sizes and thicknesses so that repair parts can be installed in the field. Like parts of duplicate units shall be interchangeable. Equipment shall not have been in service prior to delivery, except as required by testing.

I. Each major component of equipment shall have the manufacturer's name, address and product identification on a nameplate securely affixed to the equipment.

2.5 Delivery, Storage, and Handling of Equipment

A. Equipment shall be shipped and delivered fully assembled, except where partial disassembly is required in order to conform to transportation regulations or for the protection of components.

B. Owner/Owner's Designee shall be responsible for unloading and shall have equipment onsite at the time of delivery permitting proper hoisting of the equipment.

2.6 Pre-submittal of Alternative Equipment

Manufactures of alternative equipment shall submit pre-approval package to the Wastewater Treatment Superintendent at least two (2) weeks prior to bid date. Alternative manufactures shall submit the following information and supporting documentation:

A. A complete set of drawings, specifications, catalog cut-sheets, and detailed descriptive material. Drawings shall show all relevant details of the unit. This information shall identify all technical and performance requirements stipulated on the drawings and in the specification. If the proposed equipment does not meet these specifications, any deviation from the specification must be expressly noted. All deviations shall be listed on a single document.

B. Detailed installation drawings illustrating how the proposed screw press will be installed. The drawings shall include plan, elevation, and sectional views of the installation. Drawings shall include details of the injection ring, mixing valve, flocculation reactor, and details of the anchor bolt locations.

C. Motor characteristics and performance information. Vendor data shall be furnished to confirm the torque and thrust rating of the drive.

D. Complete bill of materials for all equipment, showing dimensions and material of construction of all components.

E. Certification by the manufacturer that all stainless-steel equipment will be manufactured in a stainless steel only factory.

F. Certification that the entire equipment will be passivated by submersion in an acid bath as specified.

G. A copy of documents proving certification of the Manufacturer's Quality Management System according to ISO 9001 and Environmental Protection Management System according to ISO 14001.

H. Details of the control and instrumentation system including wiring diagrams.

I. Information on equipment field erection requirements including total weight of assembled components and weight of each sub-assembly.

J. List of recommended spare parts.

K. A maintenance schedule showing the required maintenance, frequency of maintenance, lubricants and other items required at each regular preventative maintenance period, including all buy-out items.

SECTION 3 - PRODUCTS

3.1 Acceptable Manufacturers

A. Huber Sludge Dewatering System **Model Q-Press 800.2**
ESMIL GROUP, Multi-Disc Screw Press Dehydrator **Model: MDQ-354 CLS**

B. Liquid polymer blending system: Velodyne VM-2P-300-D
Polymer feeding system: VM-3P-600-D-0-A-2

C. Sludge feed pump: (Huber's standard sludge feed pump) Boerger or Equal
Nemo Netzsch NM045BY

D. Dewatered Cake Conveyor: Rotamat Screw Conveyer Ro8t/273
Ekoton KVE shaftless screw conveyor

E. Pre-approved alternate manufacturer(s), Alternates shall not be acceptable unless they have been pre-approved.

3.2 Performance and Design Requirements

A. Sludge to be dewatered shall be well-mixed and well blended having the following characteristics:

1. Sludge: WAS

a) Treatment Process: Aeration Basin with Secondary Clarifier

b) Solids concentration: 1.0 – 4.0%

c) Volatile solids: $\leq$ 80%

d) other sludge characteristics:

i. pH 6.5

ii. Temperature 70°F

iii. TDS $\leq$ 352.5 mg/L

iv. Phosphate $\leq$ 50 mg/L

v. Chloride $\leq$ 34 ppm

vi. Dissolved Oxygen $\geq$ 0.5 mg/L

B. Each dewatering screw press shall be capable of dewatering 60 Gallons per Minute (GPM) of the specified municipal wastewater sludge to a final solids content of 20%. The solids capture rate shall be a minimum of 97%.

C. The sludge dewatering plant consists of the following major parts: a) Screw Press including support legs. b) Polymer dosing system c) Sludge feed pump d) Controls e) Skid mounted

D. All parts of the dewatering press shall be designed and appropriate for the service specified and indicated and for continuous operation.

E. Sufficient room for inspection, maintenance repair and adjustment shall be provided. Owner/Owner's Designee shall provide onsite installation of the skid mounted dewatering screw press.

F. The physical layout shown on the drawings is based on the Huber Screw Press Q-Press 800.2. If equipped by another manufacturer is to be supplied, Manufacturer shall include in the bid all necessary modifications to the piping, electrical, structural, and mechanical layouts to accommodate the equipment proposed.

G. All Parts shall be designed and manufactured to handle the forces that may be exerted on the screw press during fabrication, shipping, erection, and proper operation according to the O&M manual.

H. All components shall be so arranged that they can be serviced from the operating floor and or skid level.

I. All components shall be balanced so that jamming at any point will not result in structural failure but will cause the drive motor to stall. All components, including the gear reducer, shall be designed to withstand, without damage or permanent distortion, the full stalling torque of the drive motor.

J. The screw press, sludge feed pump, liquid polymer blending system, flocculation piping, polymer injection ring and mixing valve, and controls will all be provided on a single skid. All connecting piping and wiring between components on the skid shall be pre-plumbed and pre-wired by the Manufacturer, Owner/Owner's Designee shall provide the following connections to the skid. Turn key process.

- **a.** Sludge feed connection to the inlet flange of the sludge feed pump.
- **b.** Drain piping from the filtrate drain flange.
- **c.** Water piping to the wash water solenoid valve connection.
- **d.** Water piping to the polymer mixing system dilution water connection.
- **e.** Power connections as needed.

K. The dewatered cake conveyor shall be provided by the Manufacturer. Installation and the assembly of the cake conveyor as well as electrical connection of the cake conveyor to the screw press main control panel shall be by the Contractor.

3.3 Sludge Dewatering Press Design Specifications

A. MATERIALS

1. Sludge dewatering press shall be manufactured from AISI 340L stainless steel shapes (rods, angles, and channels), pipes and sheets. In particular, wedge wire basket, screw, shaft, covers; support legs, fasteners and anchor bolts shall be made of this material.

2. Wipers for helical screw flights shall be of wear resistant polyurethane (PU) material. Wipers must have a basket contact width of at least .315 in (8 mm). The wiper is held in place by stainless steel clamps and set screws which can be easily removed. The wiper shall have a self-contained dampening mechanism to maintain constant contact with the basket while limiting wear. Wiper self-contained dampening mechanism shall

compensate for up to 4 mm of radial wiper wear. Brushes without this functionality shall not be accepted.

B. DESIGN

1. The screw press shall be installed inclined (at 12°). Dewatering of the sludge takes place in a basket, which consists of three sections of wedge wire baskets. The overall basket length shall be 120in (3,050mm). The basket diameter shall be 25in (620mm).

2. The screw press support legs shall be capable of field adjustment for ease of installation.

3. The screw press shall be completely enclosed to prevent odor emissions. The whole dewatering section and basket area shall be easily accessible through an inspection lid, which is mounted via two hinges on the side of the machine.

4. Each section of the wedge wire basket shall be split in half along the length of the basket to allow for easy separation of the basket halves for servicing of the wiper. The basket shall be fastened together using bolt fasteners made of stainless steel. The screw press shall be provided with alignment pins for ease of basket alignment during reassembly. The bottom half of the wedge wire basket shall remain inside of the machine during servicing of the wiper for ease of maintenance. Designs which require the bottom half of the basket to be removed from the machine for servicing will not be accepted.

5. The screw press shall be completely enclosed to prevent odor emission. The whole dewatering section and basket area shall be easily accessible through inspection panels, which are mounted via hinges on the sides and quick release latches on the top of the machine.

6. A screw shall be installed inside of the screen basket. The screw transports the sludge from the inlet to the discharge area at the end of the pressure zone. Its shaft diameter shall be conical towards the discharge section of the machine. The flights of the helical screw shall be provided with brushes to clean the wedge wire screen from the inside.

7. The screw shall be shafted and made of stainless steel. A shaft-less screw is not acceptable. A bearing shall support the discharge end of the screw shaft. Wear strips are not acceptable.

8. A screw drive shall be provided at the discharge side of the press. The nominal motor power shall be 3.0 HP. The motor speed shall be controlled with a VFD. The drive unit shall be directly coupled to the screw shaft through a planetary gearbox.

9. A pressure sensor shall be installed at the inlet housing of the screw press. The pressure sensor provides a signal which is used to control the speed of the auger. The pressure in the inlet box shall automatically adjust the speed of the screw via the control system and the range for the pressure shall be adjustable at the HMI. Designs which do not control the screw speed based on the inlet pressure are not acceptable.

10. The cleaning of the wedge wire screen from the outside shall be performed by two rotating spray bar washing systems utilizing a single drive (drive: 0.1 hp, 460 V, 3 phase) made of stainless-steel piping and PVDF spray nozzles. The spray wash system shall be split into two systems, upper and lower, to cover the entire area of the basket by rotating around the circumference of the basket. Its spraying shall cover the entire area of the screen and also cover the interior of the screw press housing. In total four

solenoid valves control the flow to each section of the spray bar washing system. The upper and lower spray bar washing systems shall have the ability to operate independently.

11. To optimize wash water consumption, the spray bar system shall have the ability to perform a quick wash of only the lower basket and/or an extended wash of the entire basket. Designs which do not have the quick wash ability shall not be accepted. Contractor shall provide water supply piping to the manifold of the spray system that shall have a 1 ¼ inch female thread connection. The system shall include two (2) proximity switches to prevent over travel of the spray bar system.

12. Spray water supply shall be designed for a minimum flow of 36 GPM (can be filtered non-potable water, allowed particle size 500 microns at maximum 200ppm) at a minimum pressure of 70 PSI. Water pressure at each nozzle of the spray bar shall be a minimum pressure of 70 PSIG. Average spray water consumption shall not exceed 40 Gallons at 70 PSIG per wash cycle. The basket shall route with maximum speed.

13. The spray wash system shall be designed to allow adjustability on two levels: timer and water demand (average per cycle). The timer and average water demand shall be adjustable at the MH.

14. A pneumatically actuated cone that serves for adjusting the pressure in the pressure zone shall be provided at the discharge end of the screening basket. The pressurized air supply shall be provided by the Manufacturer.

15. The pneumatically actuated cone is controlled by a 5-2-way solenoid valve. The solenoid directs the pressurized air to the ports which engage or disengage the cone at the discharge of the screw press. The control valve shall be installed in a local control station which also houses the pressure control valve and the pressure switch. The switch monitors the availability of pressurized air. If the supply of pressurized air is interrupted, the switch shall send a signal to the PLC and an alarm message will be generated.

16. Sludge cake shall be automatically discharged through a rectangular sludge discharge opening. The discharge height shall be minimum 37 in. above floor level.

17. Owner/Owner's Designee shall provide a 6 in. diameter drain line for the filtrate and connect it to the bottom drain connection of the screw press. The drain line shall also be provided with a 1.5 in. flush connection with manual ball valve.

3.4 Internal Piping

A. Manufacturer shall provide the sludge feed pump installed on the skid. The sludge feed pump shall be of the progressive cavity type. The pump shall be controlled through a variable frequency controller (VFD) which is accepting a pacing signal from the screw press control panel, supplied by the manufacturer of the screw press.

B. Manufacturer shall provide sludge feed pipe from the sludge feed pump with (VFD) through a magnetic-inductive flow meter through a polymer-dosing ring, polymer mixing valve.

C. Polymer dosing ring and polymer mixing valve shall be supplied by the screw press manufacturer.

D. Pipe flocculator to be supplied on the skid by the manufacturer and shall provide a minimum retention time of 45 seconds at design flow for the polymer and sludge mixture.

E. The design of the flocculation pipe reactor shall be approved by the screw press manufacture.

F. The size of the piping needs to take into account: maximum capacity, loading rate, minimum velocity in piping to avoid sedimentation and conditions which do not negatively impact the flocculation process.

3.5 Polymer Dosing System for Liquid Polymer

A. System shall be designed for the preparation and dosing of up to 300 GPH of polymer solution having an active polymer concentration between 0.05 and 0.25%. The actual size of the polymer system depends on the specified type of sludge, maximum capacity and polymer consumption.

B. The polymer station shall be self-contained with pumps, piping, fittings, and accessories, and shall be factory assembled and tested to eliminate field assembly work and therefore to minimize installation and start up time. The frame shall be 304 stainless steel and the piping SCH. 80 PVC.

C. A polymer mixing chamber shall be provided. A high energy, multi zoned, hydro-mechanical mixing device shall be provided. The mixing chamber shall have a translucent front cover.

D. The hydro-mechanical impeller shall be designed to produce variable intensity, back flow mixing action to optimize polymer performance without damaging polymer molecular structure.

E. The motors shall be 0.5hp, 1750rpm, 90 V, 60 Hz, wash down duty with keyless shaft and left-hand impeller mounting screw.

F. Materials: Impeller – SS; body of mixing device – SS; cover – clear Lexan; fastener – 316 SS; seals – Viton; pressure rating – maximum 100 PSI.

G. Owner/Owner's Designee shall provide a drinking water connection for the dilution of the polymer in the polymer tank. The water piping to the polymer blend system shall include a minimum 1 in. inlet (NPT female), an UL listed solenoid valve (rated IP65), and a flow meter with a rate adjusting valve and low-pressure alarm switch.

H. A neat polymer metering pump with hose connector shall be provided and connected through a ½ in. barbed hose to the polymer mixing device. The neat polymer pump shall be a progressive cavity type pump.

I. Control Panel: NEMA 4X FRP enclosure, 120 VAC, 60Hz, 1 PH service.

1. Operator interface – discrete selector switch (system ON/OFF/REMOTE); mechanical mixer speed adjust potentiometer; ten-turn potentiometer – progressive cavity metering pump control.
2. Status / Alarm indicators: system running indication; LCD display of metering pump rate; low pressure switch alarm; low polymer flow alarm.
3. Inputs: remote start / stop (discrete dry contact); pacing signal from main control panel (4-20mA).
4. Outputs: system running (discrete dry contact); remote mode (discrete dry contact); low pressure alarm (discrete dry contact).

J. The pressure side of the polymer system shall be connected through a minimum 1 in. diameter PVC pipeline and a magnetic inductive flow meter to the polymer injection ring described above.

K. The injection ring is the place where the polymer is added to the sludge. A mixing valve with adjustable weight follows to ensure optimum mixing conditions and creating the right size and strength of flocks. The retention time between the mixing valve and the dewatering machine shall be a minimum of 30 seconds at maximum flow.

3.6 Sludge Feed Pump

A. General – Unless otherwise stated, the sludge pumps shall be progressing cavity Moineau principal type suitable for pumping sludge as indicated below:

1. The sludge feed will be waste activated sludge as described in Paragraph 2.02. A.1.

2. The progressing cavity pump should meet the following performance parameters:

Flow:	60 GPM
Discharge Pressure:	35 PSI
Maximum RPM:	350 RPM
Maximum Horsepower:	5 HP
Manufacturer:	Boerger or Equal; NETZCH NM045BY
Flange Sizes:	3-INCH ANSI

B. Pump Suction and Discharge Casing

1. The pump casing shall be designed for the type of service specified and shall be of sufficient strength, weight, and metal thickness to ensure long life, accurate alignment, and reliable operation. The suction casing shall be constructed of close-grained cast iron and have two clean out ports. The casing shall have connection for vents, drains, and gauges.

2. The suction and discharge connections shall be ANSI/B16.1 flanges sized for the pump specified. The discharge flange shall have a vent/gauge connection that can be rotated in 90° increments. The discharge support feet shall be separate from the discharge flange.

3. The pump shall be supplied with adequate NPT connections for stuffing box drainage, pump drainage, flushing and gauge connections.

C. Stator

The pump's stator shall be formed from a single piece Buna-n-rubber sleeve inside a two-piece extruded aluminum shell. The stator shall be affixed to the suction casing by the use of four (4) thru-bolts for easy removal and replacement. Stators shall not be affixed to the suction casing by threaded connections or by snap rings. The suction edge of the stator shall be chambered to allow for unrestricted flow into the pumping elements. The seal shall be integral to the stator sleeve at the suction and discharge to prevent leakage. The use of separate O-rings or flat rings for stator sealing shall not be required. Stator designs that limit nominal pump pressure capability to less than 90 PSI shall not be accepted.

D. Rotor

The rotor shall be precision machined from tool steel with a chromium content of 11–13.5% hardened to a Rockwell C hardness of C57-60 and then covered with heavy layers

of hard chrome plating. The rotor shall be driven by means of a heavy-duty sealed drive train.

E. Drive Train

The rotor shall be precision machined from 316 stainless steel. The rotor shall be driven by means of a heavy-duty sealed drive train. The rotor shall be joined to the drive shaft by means of a connecting rod with sealed pin type universal joint at each end. The sealed pin type universal joints shall be factory lubricated with oil and completely sealed from the fluid being pumped, utilizing a metal cover over the pin and flexible rubber seal on the connecting rod end. The joint seal shall not employ sacrificial parts such as clamp bands and shall not require special tools to assemble. To optimize seal and pin joint life, the connecting rod shall be of sufficient length to maintain its operating angle within 1 degree. Flexishafts, cardin joints, and unsealed pin joints are not acceptable.

F. Shaft Seal

The pumps shall be fitted with a Single Mechanical Seal with Silicon Carbide Seal Faces and 316 stainless steel metal parts. The mechanical seal shall be a rubber bellows seal. Mechanical seal shall be inside mounted, located inside the pump suction housing with ample open area around the seal and not in a dead-end enclosed housing where solids or scum could accumulate.

G. Pump Drive Shaft

1. The drive shaft shall be of the solid drive shaft design in order to avoid clogging and/or trapping solids, which could either interrupt the movement of the connecting rod or disturb the seal of the rear pin joint. Maximum shaft deflection under normal operating conditions shall not exceed .002". The portion of the drive shaft that passes through the stuffing box shall be hard chrome plated or shall be provided with a replaceable hardened chrome plated shaft sleeve. Hollow or telescoping designed drive shafts are not acceptable.

2. The universal joint head shall be removable from the drive shaft to allow access to the stuffing box or mechanical seal without disturbing the drive end of the pump.

H. Motor Features

The motor to be TEFC, Premium Efficient with class F insulation, 1.15 service factor. If the pump is to be controlled by a Variable Frequency Drive, then the motor to be Inverter Duty suitable for a 5:1 constant torque turndown ratio. Motors are to be manufactured by Nord.

I. Gear Reducer Features

The gear reducer shall be parallel in-line helical reducer with a 1.4 service factor. The gear case is to be single piece SAE 30 gray cast iron with internal reinforcements for strength and rigidity. This design eliminates oil leakage, oil contamination and gear set misalignment problems common to drives with bolt-on output cover or flanges.

3.7 Controls and Instrumentation

A. The entire control system shall be provided by the Manufacturer of the Screw Press.

B. The Manufacturer shall provide wiring between all skid mounted skid mounted system components as required.

C. The Owner/Owner's Designee shall provide 460 V, 60 Hz, 3 phase power supply to the main control panel.

D. The dewatering system shall be full-automatic and shall include the following:

1. Main control panel for screw press

2. Polymer system control panel

3. Magnetic-inductive flow meter for thin sludge feed and polymer

4. Automatic control for the pneumatic pressure cone

E. A 460-volt main control panel shall be provided in a NEMA 4X rated stainless steel enclosure. The enclosure shall be suitable for wall mounting, shall have hinged covers which swing horizontally and shall be held closed with mechanical spring-loaded fasteners, and shall include the following:

1. Main power disconnect switch (pad-lockable)

2. Control power transformer

3. Surge arrester

4. H-O-A control switches (screw drive including F/R selector switch, thin sludge pump, wash water solenoid valve)

5. 3.0 hp Variable Frequency Controller (VFD) including over-current and over-heat protection for screw press main drive

6. 0.1 hp reversing motor starter including over-current and over-heat protection for the wash water spray drive.

7. 5.0 hp Variable Frequency Controller (VFD) for sludge feed pump

8. 1.5 hp Variable Frequency Controller (VFD) for dewatering cake conveyor

9. Pressure sensor at the inlet of the screw press: 4-20 mA signal is sent to the PLC. The sensor shall also have a discrete relay output, freely adjustable at the sensor, indicating high pressure conditions at the screw press inlet

10. Programmable logic controller (PLC) Allen Bradley Compact Logic with on-board Ethernet

11. Operator Interface (OIU), Allen Bradley Panel View 700 with color touch screen and Ethernet communication.

12. The PLC shall have the capability to work as a data logger. The data logger shall document all important process parameter but not limited to the following list:

a. Operation mode: OFF, dewatering, back wash, shutdown

b. Drive operation: forward, reverse

c. Sludge flow (GPM)

d. Screw speed

e. Polymer pacing signal

f. Pressure screw press inlet

g. Motor amperage draw

h. Set points: feed solids, polymer consumption, solids loading

13. Running time meter for screw press and feed pump

14. Text messages displayed on touch screen:

a. Over-current indications

b. Spray bar washing system on

c. Polymer dosing station status

15. Operating and warning lights for the following:

a. Power on

b. Dewatering system in operation

c. Malfunction indication

d. Reset button

16. Laminated plastic nametags shall be provided for the name of the control panel, and all disconnects, switches, lights and meters.

17. Spare terminals (control – and power voltage) shall be provided to accommodate for remote control operation and to interface with other equipment components such as the polymer dosing system, thin sludge pumps etc.

18. Control panel (120VAC, single phase) for polymer dosing station shall be furnished by polymer dosing station supplier, to guarantee always constant concentration in the dosing chamber, with the following features:

a. connection terminals and control and safety devices:

i. polymer make down system run signal

ii. flow control neat polymer pump (accepting 4-20 mA signal)

b. signals to main control panel:

i. system run signal

ii. malfunction polymer station

c. Control panels shall be factory wired and pre-tested.

SECTION 4 – EXECUTION

4.1 Installation, Start-up and Operator Training

A. Manufacturer shall verify all dimensions of the skid components to ensure compliance of equipment dimensions with the drawings. Manufacturer shall notify Wastewater Treatment Superintendent of significant deviations.

B. Installation of the equipment shall be in strict accordance with the contracts documents and the manufacturer's instructions and shop drawings. Manufacturer shall supply anchor bolts for the equipment. Owner/Owner's Designee shall install the anchor bolts in accordance with the manufacturer's recommendations.

C. Touch-up paint shall be applied after installation to all scratched, abraded and damaged shop painted surfaces. Coating type and color shall match shop painting. Owner/Owner's Designee shall passivate all field welds.

D. Manufacturer shall furnish the services of a factory-trained service engineer for two (2) trips including a total of eight (8) workdays to inspect the installation, observe start up, and provide operator training.

1. Equipment shall not be energized, or "bumped" to check the electrical connection for motor rotation without the service engineer present.

2. The service engineer shall make all necessary adjustments and settings to the controls.

3. The service engineer shall demonstrate proper and sequential operation of the dewatering system. The dewatering system shall be able to operate fully automatically.

4.2 Performance Testing

A. After start up, operational testing and adjusting:

B. Submit the screw press to a performance test to:

1. Performance test shall commence within two weeks of having the screw press installation, start up, operational testing and adjusting is complete.

2. Demonstrate the screw press can perform.

3. Run a minimum of two (2) test.

4. Test will be made five (5) hour runs.

5. Days between run will vary 3-4 days.

6. Buyer and Seller will work together on a testing schedule.

7. After two performance test have been completed, The Buyer will continue to operate the screw press for 30 days based on the final set points to verify long term performance.

a. Buyer will continue to collect samples 2-3 times per week during the extended performance operation to confirm that the equipment continues to meet the guaranteed performance.

b. Buyer will split samples collected for analysis with the Seller at the request of the Seller, however the Seller shall pay for all analysis of the Buyer's samples.

c. Seller shall be available to Buyer on call in the event that technical assistance is required from the Buyer.

C. Collect samples at the following locations:

1. Solids discharge

2. Pressate discharge

3. Screw press feed pipe

4. Samples collected at the end of each test run and at 60-minute intervals after start.

5. Each day's sample will be combined for a composite sample for testing.

6. Each day's composite will be split.

7. Test results will be averaged over the test period.

D. Seller shall have the following test performed by an independent EPA accredited laboratory to determine solids concentration and suspended solids recovery unless otherwise negotiated with the Buyer. Laboratory shall also collect samples.

1. Screw press solids: Total solids

2. Pressate: Suspended

3. Screw press feed: Suspended solids and volatile solids.

4. Computation to determine solids recovery efficiency to be determined from the following formula:

$$\% \text{ Recovery} = \frac{C(F-E) \times 100}{F(C-E)}$$

Where C = % solids (total solids)
F = % feed solids (suspended solids)
E = % pressate solids (suspended solids)

All values expressed as a decimal

E. If performance fails to meet the specifications:

1. Seller will be allowed to make corrections and retest.

2. All adjustments and retest to be made within 90 days of first test at Seller's cost.

3. Seller will be allowed one retest for the full-scale performance test. If after the second test the equipment does not meet the required performance, the Seller will refund all funds delivered thus far to the Buyer in a lump sum, payable in a cashier's check to the Fort Valley Utility Commission and take possession of the equipment at the Seller's expense unless otherwise negotiated with the Buyer.

SECTION 5 – CONTRACT REQUIREMENTS

5.1 Warranty

The manufacturer will warrant against any defects in material or workmanship to the screw press and framework. This warranty will commence upon delivery of the products and will expire on the earlier occur of one (1) year from initial operation of the product or 18 months from delivery thereof (the "Warranty Period").

5.2 Terms of Payment:

A. 75% upon delivery of equipment (net 30 days)

B. 25% upon satisfactory completion of performance testing (net 30 days)

The successful Manufacturer shall enter into a Goods and Services Agreement with the Fort Valley Utility Commission. Payment shall be made in accordance to 5.2 Term of Payment of this RFB and upon receipt of the Manufacturer's billing statement, for work to date. The invoice shall include a summary of progress through the billing date and shall not be submitted more often than once per month. All billing shall be processed through the Wastewater Treatment Superintendent.