

Addendum No. 2 February 1, 2024 Page 1 of 11

TOWN OF SEABROOK, NEW HAMPSHIRE

WWTF UPGRADES (SEABROOK BID NO. B2024-SWR-14; CWSRF NO. CS-334178-04)

ADDENDUM NO. 2

To be considered as part of the contract drawings and specifications for the WWTF Upgrades (Seabrook Bid no. B2024-SWR-14; CWSRF no. CS-334178-04), dated 01/04/2024:

REVISIONS TO SPECIFICATIONS

- 1. Section D Attachment Davis Bacon Wage Rates (Revised and Re-issued)
 - a. Please see the attached revised wage rates for the project. These will be in place for the duration of the project and will not change.
- 2. Section 01 14 19.14 Temporary Dewatering System
 - a. Paragraph 3.01.E
 - i. Remove and replace paragraph in its entirety with the following: "The Contractor shall ensure that sufficient polymer stock is available on site for the startup and training of the temporary system. The cost of and supply of polymer shall be the responsibility of the Contractor during the period which they are operating the equipment. The Contractor shall ensure that one full, unopened 275-gallon tote of the manufacturer's recommended polymer is paid for by the Contractor and on site for the Owner at the point in which the Owner takes over the operations. Any remaining polymer procurement will be the responsibility of the Owner."
 - b. Paragraph 1.02.A
 - i. Add the following to the end of the paragraph: "The temporary pumping system shall pump sludge directly from the sludge storage tanks to the temporary dewatering system outside via redundant (2+) suction lift or submersible pumps. There shall be a means to properly manage the feed rate, either via flow meter and VFD or other approved method. This is the responsibility of the Contractor to provide and install."
- 3. Section 40 61 96 Process Control Description (Revised and Re-issued)
 - a. Revised section regarding centrifuges to indicate that there shall be two control panels (one for each centrifuge). Refer to all bolded text in the attached specification.
- 4. Section 43 11 33 Rotary Lobe Blowers (Revised and Re-issued)
 - a. Revised the controls description to clarify that an Aertronics (or equal) local controller shall be provided integral to each blower. This will communicate with the SD-MCP via ethernet. This will also control the VFD.
- 5. Section 43 23 57 Progressing Cavity Pumps
 - a. Paragraph 1.04.A.8
 - i. Remove the words ", variable frequency drives," from the first sentence. Pump manufacturer does not need to supply the VFDs for these sludge pumps. These may be supplied by the Contractor in accordance with Section 26 29 23.
 - b. Paragraph 2.04.D
 - i. The local HOA switch and E-Stop shown on the P&IDs shall be provided by and installed by the Contractor.

- 6. Section 46 76 33 Dewatering Centrifuge Equipment
 - a. Paragraph 1.04.A.2
 - i. Add the following language: "The centrifuge shall be able to clean itself after a power loss by clearing/conveying solids out of the machine during its spin down cycle."
 - b. Paragraph 1.04.C.3.b
 - i. Revise minimum bowl length to 100 in
 - c. Paragraph 1.04.C.3.c
 - i. Revise operating centrifugal force to 3,000-3,600 G
 - d. Paragraph 2.11.B
 - i. Add the following to the first line: Control Panel"s (CF-CP1 and CF-CP2)"
 - Add the following after the first line: "Descriptions of the control panel is identical for each of the supplied panels. The scope shall include two (2) control panels and two (2) operator interface terminals (CF-OIT1 and CF-OIT2)."
 - iii. Added 2.11.B.18: "The Centrifuges shall be supplied with a local Operator Interface Terminal CF-OIT that is shipped loose and installed by the Contractor in the centrifuge room. This terminal shall have an HMI Touchscreen (minimum 7" display) and shall be NEMA 4. It shall have the ability to control each centrifuge via an ethernet connection to CF-CP."

REVISIONS TO DRAWINGS

- 1. Drawing S301 Structural Sections and Elevations (*Revised and Re-Issued*)
 - **a.** Clarifications are shown for how the reinforcement is installed for the opening and double door on the blower/conveyor room walls.
- 2. Drawings ED100, E201, E202, E204, E602, E603 (*Revised and Re-Issued*)
 - **a.** Various revisions and clarifications are shown, including the indication of two centrifuge control panels and a physical manual transfer switch to select between the two centrifuge panels, both powered by the same breaker in the EMCC.
- 3. Drawing I101 P&ID (*Revised and Re-Issued*)
 - **a.** Revised the blower control schematic.
 - b. The local HOA switch and E-Stop for the Centrifuge Feed Pumps (LCS-302 and LCS-304) shown on the P&IDs shall be provided by and installed by the Contractor.
- 4. Drawing I102 P&ID (*Revised and Re-Issued*)
 - **a.** Two centrifuge control panels shall be supplied CF-CP1 and CF-CP2.
 - b. Both CF-CPs shall be equipped with HMI touchscreens.
 - **c.** CF-OIT1 and CF-OIT2 are separate control interfaces that shall be wall-mounted in the centrifuge room on the wall next to the electrical room. These shall be field wired via ethernet and any low voltage power needed.
- 5. Drawing M108
 - a. Section 9 revise reducer size to blower inlet/outlet to be 8"x6" instead of 10"x8" (typ. 2 per blower – see sketch below).



- 6. Drawing P601
 - a. Revise the TMV-B model to Guardian Model no. G6042 ITP.
 - b. Delete note #4 for RCP-1.

QUESTIONS AND ANSWERS

Q: Will a conduit/conductor schedule be furnished for field wiring of motors and instruments?

A: Refer to the revised and re-issued electrical drawings.

Q: Section 46 76 33, paragraph 1.04.A.2 – The language indicates a need for a disposal device with capacity to accept bowl contents during a power loss. Does this mean that the unit shall be equipped with the ability to clear the bowl of solids in the event of a power loss? This is an optional feature on our unit that can be provided.

A: Yes, it does. Please provide this feature. This is clarified in this addendum.

Q: Section 46 76 33, paragraph 1.04.C.5 – Cake conveying equipment is outside of centrifuge manufacturer scope, please advise if centrifuge manufacturer is responsible for storage of cleared solids during a power loss. With our power run through feature the unit can capture energy from the bowl decelerating to power the backdrive and ancillary conveyors to clear and convey solids in case of power loss. Is the intent to have the solids conveyed or stored in the conveyors?

A: Yes, these will be discharged into the conveyor hopper/conveyors and any liquid sludge should funnel down to the drain in the bottom of the inclined conveyor.

Q: Section 46 76 33, paragraph 1.04.C.3.b – Please revise 18" bowl length to 100" bowl length.

A: This is addressed in this addendum.

Q: Section 46 76 33, paragraph 1.04.C.3.c – Industry standard for G-force is 3,000 Gs. Most municipal applications run below 3,000 Gs as running at higher forces will increase energy consumption without seeing an increase in performance. Please adjust to 3,000 G minimum.

A: This is addressed in this addendum to include a range of 3,000-3,600 G.

Q: What is the scope of work with regards to the Fire Alarm? Will Fire Alarm drawings be provided?

A: Fire Alarms are not being modified within the scope of this project.

Q: What surfaces are to be painted? Will a finish schedule be issued?

A: All surfaces that are newly exposed (e.g. concrete floors underneath demolished curb/pads, CMU block that is modified/exposed in any way) shall be primed, painted, and/or sealed to match the existing conditions around them. All new CMU block shall be primed and painted to match the existing colors. All new process piping shall be painted and labeled per the specifications. All new rigid metal conduit without PVC coating shall be primed and painted per specifications. Any equipment or material that has its painting or protective layer damaged (e.g. galvanized metals) shall be painted or sealed with a material to match existing. HVAC equipment shall be painted in accordance with Division 27 and Division 09. All galvanized metals in corrosive environments (Influent Building Second Floor, Sludge Disposal Building Centrifuge Room, Dumpster Bay, and Sludge Pump room) shall be electrogalvanized. All electrical conduits in the Influent Building Second Floor room shall be PVC coated rigid metal conduit according to Division 26.

Q: General notes on drawing AD101 references "FIRE SUPPRESSION SYSTEMS, PIPING, CONTROLS, ETC...", are existing drawings of the fire suppression system available?

A: These are general notes. No new fire suppression systems are required.

Q: Is a new fire suppression system required?

A: No.

Q: Section 07 11 00 Silicone Dampproofing, paragraph 3.02 A states "The entire exterior brick surface shall be dampproofed using the materials specified herein.". Drawings AD101 & A101 only show one elevation and do not indicate the material makeup of the façade. What are the surfaces to receive silicone dampproofing?

A: Any exterior penetrations, such as the alarm light for the gas detection system, will require this.

Q: TOC PAGE iii lists 40 92 49.13 - Variable Frequency Drives but we could not find that specification. Please confirm spec 26 29 23 Variable-Frequency Motor Controllers is the applicable spec for VFDs.

A: Confirmed. Section 40 92 49.13 was removed from the Table of Contents.

Q: Drawing S101 - Confirm that New Centrifuge Supports on the 2nd floor will not require additional shoring or bracing from below to transfer live and dead loads onto the 2nd floor beams.

A: Confirmed. These will be supported by the four feet of the frame on top of the proposed concrete pads.

Q: Please confirm if there are any known or suspected PCB, asbestos, or other hazardous materials associated with demolition and disposal of existing materials that could impact bid pricing.

A: No. These buildings were constructed after 1992.

Q: 46 76 33 - Centrifuge Spec. Please confirm that the Owner will provide polymer for the start-up and testing of the new Centrifuges and Polymer feed systems.

A: Confirmed.

Q: Can the deadline for RFIs be extended one (1) week to account for anything that comes up at the pre-bid site visit?

A: Our standard is two weeks prior to bid opening. Barring any major unforeseen circumstances, we do not anticipate extending the RFI deadline.

Q: Drawing SD101 has a note in the Blower Room for "existing equipment pads to remain", while drawing M103 Note 7 indicates that two (2) of these pads are to be demolished. Please confirm the pads are to remain.

A: These are to be removed per sheet M103. The existing pads are closer to the wall than they need to be and will make it more difficult to remove/install new blowers around them.

Q: Drawing SD101 has a note in the Operations Area for "existing equipment pads to remain" at the hydraulic pumps/air compressors, while drawing M103 Note 4 indicates to remove concrete equipment supports. Please confirm the pads are to remain.

A: The pads for the hydraulic pumps/air compressors will remain. This is clarified in this addendum.

Q: Regarding approved dewatering unit providers; can Pace Dewatering Systems be added as an approved vendor?

A: If this is regarding the temporary dewatering system as described in Section 01 14 19.14, these vendors will be submitted to the Engineer after the contract is awarded based on the references provided as required by Section 01 14 19.14. If this is regarding the permanent dewatering centrifuges as described in Section 46 76 33, then no they will not be allowed as approved equals as they did not complete a pilot study at the facility, which is a requirement of the specifications.

Q: Spec section 01 14 19.14 Temporary Dewatering System – Section 3.01 E states "The contractor shall ensure that sufficient polymer stock is available on site. The cost of and supply of polymer shall be the responsibility of the Contractor". Polymer is a 3rd party liability such that the operators of the system may dictate usage of the polymer and potentially could overdose the application with no consequence to them. Please confirm the Contractor is only responsible for the cost and supply of polymer while the Contractor is operating the dewatering system.

A: This is addressed in the specification section in this addendum.

Q: Spec section 01 14 19.14 section 3.03 *D* states "480v, 3PH, 60 HZ power is available onsite for the temporary dewatering system" and goes on to say that power costs will be paid by the owner. Can you confirm how many amps of service will be available?

A: We will make sure at least 200 amps are available.

Q: Please clarify stainless steel pipe sizing, the drawings have conflicts between 8" and 10".

A: This is addressed above in the Drawings section. Reducers should be 8"x6" into each inlet/outlet (typ. 2 per blower). Otherwise, the drawings on sheet M108 are correct. Each individual blower's suction and discharge piping is 8" until it meets the new 10"x8" tee and 10" header on the suction side or the existing 10"x8" tees on the discharge side.

Q: Specs call for a gas detection system but we could not locate anything on the drawings and fear no sub will bid, please clarify.

A: Refer to specification section 40 76 00 as well as the drawings E204 and H102 Second Floor Plan Views. Gas Detection system should be installed in the Influent Building on the second floor inside the double doors, to the left side on the wall when you walk in. The alarm light should be installed on the exterior side of the building in this area.

Q: What is the scope of work for the contractor to install racks and totes in the polymer area?

A: The Owner will purchase three polymer totes and a racking system that is approximately 8' wide and 4' deep, similar to a warehouse store rack (like Home Depot). The rack will have one shelf at approx. 8" above the floor, and another shelf at approx. 60" above the floor. Both shelves will span the full width and depth of the racking system.

Q: There was no conduit and wire schedule, I believe it was stated this would be addressed by addendum, please verify.

A: Please refer to the revised and re-issued electrical drawings.

Q: Please indicate the intention for withdrawing sludge to a temporary dewatering system?

A: This is also addressed in the Specification section of this addendum. The temporary pumping system shall pump sludge directly from the sludge storage tanks to the temporary dewatering system outside via redundant (2+) suction lift or submersible pumps. There shall be a means to properly manage the feed rate, either via flow meter and VFD or other approved method. This is the responsibility of the Contractor to provide and install.

Q: We have not received lead times for equipment but the contract time may not be enough, how will this be handled as it appears there will be no work done in 2024?

A: Once a Contractor is awarded and they receive lead times for all equipment, we can have a discussion regarding project times. The Owner and Engineer will be reasonable when assessing the estimated completion dates with the Contractor.

Q: Based upon information provided by one of the named Centrifuge vendors, it has been determined that there is inadequate time to complete the project within the stipulated time frames (486 calendar days for SC, and 516 calendar days for FC). Listed below are the activities with anticipated durations that were used to make this determination:

- Project Award
- Centrifuge Buyout Process = 30 WD's

• Submittals from Centrifuge Vendor = 40 WD's after PO issued (duration provided by Centrifuge Vendor)

- Submittal Approval Process = 40 WD's
- Fabricate and Deliver Centrifuges = 200 WD's (duration provided by Centrifuge Vendor)
- Mechanical Demolition Work 15 WD's
- Install Centrifuges and Piping = 40 WD's
- Electrical Work = 80 WD's (Electrical Work commences with Mechanical Demolition Work)
- Centrifuge Startup and Performance Testing = 30 WD's (duration provided by Centrifuge Vendor)

Total Duration of 1 through 9 above = 613 CD's.

Please consider revising the project's milestone durations based upon this information

A: We acknowledge this information and also acknowledge that these vendors heir on the side of caution when giving these estimates during the bidding process. We will definitely work with the awarded Contractor to determine the estimated time frame and will extend the completion dates once equipment is selected and vendors of the awarded Contractor give their updated lead times if the lead times prohibit a completion date within the currently specified time of 486 and 516 calendar days for substantial and final completion, respectively.

Q: Panel EPBD-L is getting a new upsized protective device. There is no indication of a new sized feeder. Please confirm conductor size & conduit size

A: This shall be a 1-1/2" conduit with 4#1 & 1#6GND from MCC to panel.

Q: The control panels for F8 & F9 seem to be existing however F8 is now a 120V/1Ø load. Will a new control panel be furnished or will rework of the existing control panel need to take place?

A: The panel will need to be modified to meet the voltage requirements. The schedule on H601 calls for the new fan F8 to be 208V. Contractor shall modify the existing panel to meet these requirements. If the contractor is able to find a fan that matches the existing voltage (480V), they may propose it during the submittal process.

Q: E204 Shows a note for F8, "See demolition Note #9" Please advise on what demolition Note #9 is.

A: Demolition Notes are on E001 on the right side of the page.

Q: Please provide NEMA ratings of each room/area affected by this scope

A: All spaces are NEMA 4X, except for the Electrical Room and Blower Room. These will be NEMA 12.

Q: Please provide conduit/conductor schedule for the gas detection system

A: Refer to the revised re-issued drawings.

Q: Where in the Influent building is the existing network panel located

A: The Owner will provide a network junction box with an ethernet cord coiled up inside the electrical room (AKA "Storage Room") on the main floor of the influent building. The contractor shall connect this ethernet to the gas detection system controller upstairs or run a new ethernet and junction switch to connect to the controller. The Ethernet cable run by the Owner will be connected to the existing Network panel in the Operations Building.

Q: Please confirm the existing Sludge Holding Blower local control panels are to be removed. This scope is not shown on ED101

A: For the two blowers being removed, the local control panel is to be removed as well. All conduits and wiring shall be removed back to their source.

Q: Please confirm we are to reuse the existing EWH-1 branch circuit for the new water heater

A: Refer to the revised and re-issued electrical drawings.

Q: Please designate a circuit for RCP-1

A: Refer to the revised and re-issued electrical drawings.

Q: Please designate a circuit for the new SD-MCP panel

A: Refer to the revised and re-issued electrical drawings.

Q: E202 shows one CF-CP panel, E602 shows two centrifuge control panels. I102 shows both centrifuges being controlled by one CF-CP, please advise

A: There will be one centrifuge panel. Refer to the specification section 46 76 33 paragraph 2.11.B: "The control panel (CF-CP) will be fed via one 480V 3ph power feed from the EMCC. CF-CP shall house all required components for both proposed centrifuge systems and shall be able to control both units. The power feed will not be capable of running both units at once. There shall be a physical selector switch for which unit is "active," which will prevent the "inactive" unit from being operated until the switch is turned."

Q: Please show field locations of SG-CP1 & SG-CP2

A: These will be located next to the sludge grinders. Refer to the revised and re-issued electrical drawings.

Q: Will the CF-OIT be integral to CF-CP or will it be installed remotely?

A: The CF-OIT is a separate interface that is shipped loose. It shall be installed in the Centrifuge room on the wall by the electrical room. It has its own HMI touchscreen. The CF-CP panel will also have a full HMI touchscreen. They shall be connected to each other via Ethernet.

Q: Please show field locations for LCS-302 & LCS-304 and which division is responsible for furnishing them?

A: The local HOA switch and E-Stop for the Centrifuge Feed Pumps (LCS-302 and LCS-304) shown on the P&IDs shall be provided by and installed by the Contractor.

Q: No new work shown on the electrical drawings for the new polymer skids, please advise

A: Refer to the revised and re-issued electrical drawings.

Q: Because this project is over a year out between starting and completing, will there be an escalation clause with the Davis Bacon wages?

A: No. The Davis Bacon wage rates attached to this addendum shall be effective for the duration of the project.

Q: As discussed, please clarify the cmu demo and, no new blocks are shown but new rebar to ceiling, this does not seem possible. Anchoring metal lintels as drawn also does not seem possible.

A: The face shells of CMU will need to be cut so that reinforcing bars can be inserted. Face of CMU will need to be formed then the cell will be grouted. For the anchoring of the lintels, in reference to Section 9 on sheet S301, slotted holes can be used to allow bolts to be inserted from an angle. Anchor bolt embed can be reduced to 5 inches.

Q: Where is silicone waterproofing required?

A: It will be used to seal up the storefront windows, and/or any louvers or other penetrations to the exterior.

Q: Where is membrane waterproofing required?

A: This will be required at any exterior openings, such as the sill, jamb, and head of the storefront window/louvers.

Q: What is the scope for the clips at the top of the existing cmu wall?

A: Continuous angles can be used at the contractor's option. Additional anchors may be necessary. These shall be installed per sheet S301 details.

Q: Is pvc water piping insulated?

A: Yes, per section 40 05 13.73 for Process Water (plant effluent re-use water) and section 22 07 19 for domestic water and hot water piping.

Q: Please confirm that there are no new dampers or louvres required on this project except the six 36'' x 48'' shown on H-101

A: This is true, there will be no other new dampers or louvers in the project other than these.

Q: Please confirm that there is no equipment or ductwork connected to the six new dampers 36'' x 48.''

A: That is correct no ductwork will be connected to these dampers

Q: It appears that the HVAC contractor will have to control existing damper motors etc. Please confirm that these are all in working order and are 120volt.

A: We are not 100% sure about the working order of the existing dampers as we did not test for this on our site visit. This will need to be tested in the field.

Q: Please confirm the intent is to have the six 36'' x 48'' louvres be supplied by the Storefront window company.

A: It is at the Contractor's discretion as to who supplies the louvres.

Q: I do not see the Hot Water Coil Shown on Drawing H-102 on the demolition drawing or on the Equipment Schedule on page H-601. Please confirm this is existing to remain or is by others.

A: There was no existing hot water coil in the influent building. We are adding a hot water coil for freezing concerns from the owner during the winter.

Q: Where is the HVAC water treatment system Spec section 23250 to be installed ? I cannot find the location on the drawings.

A: This is for the existing glycol/other chemicals feeders for the existing hot water system that will need to be emptied and refilled during the new HWS/R piping installation. This would not be shown on the drawings.

Q: The main breaker in the Sludge Holding building MCC is shown as a 400A frame with a 300A trip. The existing circuit breaker appears to be a fixed 300A circuit breaker. The breaker as a whole will need to be replaced. Please advise.

A: Contractor shall replace the existing 300A circuit breaker with a new 400A circuit breaker. The new circuit breaker shall match existing in style and AIC rating.

ATTACHMENTS

1. Pre-Bid Meeting Minutes

Addendum No. 2 February 1, 2024 Page 11 of 11

- 2. Section D Attachment Davis Bacon Wage Rates
- 3. Section 40 61 96 Process Control Description
- 4. Section 43 11 33 Rotary Lobe Blowers
- 5. Sheet S301 Structural Sections and Elevations
- 6. Sheets ED100, E201, E202, E204, E602, E603
- 7. Sheet I101 P&ID Blowers and Pumps
- 8. Sheet I102 P&ID Centrifuges

END OF ADDENDUM NO. 2

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100 International Dr Suite 152, Portsmouth, NH 03801 Tel: (603) 431-3937

PRE-BID MEETING MINUTES

Project name:	Seabrook, NH WWTF Upgrades		
Project number:	W&S NO. ENG22-0322		
	SEABROOK BID NO. B2024-SWR-14		
	CWSRF NO. CS-334178-04		
Date:	January 24, 2024		
Time:	10:00 AM		
Location:	Seabrook WWTF - 274 NH-286, Seabrook, NH 03874		

<u>Attendance</u>

Name	Company	Phone	Email
Curtis Slayton	Town of Seabrook		
David Cloutier	NHDES	603-271-0626	David.r.cloutier@des.nh.gov
Deanne Hergt	NHDES		<u>Deanne.r.hergt@des.nh.gov</u>
Jarod Stuyvesant	Weston & Sampson	781-670-5322	Stuyvesant.jarod@wseinc.com
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Jeremy Mains	Mains Electric	603-833-3312	jeremy@mainselectric.com
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	Electrical		
Sam Milbury	Synagro	443-454-7652	<u>Smilbury@synagro.com</u>
Carlin Berger	Penta Corp	603-476-5525	pentacorp@pentacorp.us
Nathan Bevins	United Rentals	603-969-5442	<u>nbevins@ur.com</u>
Jason Babbidge	Northeast Earth	603-833-1988	jasonb@neearth.com
Sean Dougherty	Waterline Industries	603-235-2783	sdougherty@waterlineind.com
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Alyssa Newell	P&H Senesac	802-238-0628	phsenesacinc@gmail.com
Kyle Mieczkowski	Methuen	603-326-2601	estimating@methuenconstruction.com
	Construction		
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Richard	T-Buck	207-595-0702	richard@tbuckconstruction.com
Wentworth	Construction		
Steve Smith	United Rentals	603-626-1152	ssmith@ur.com

Minutes:

- 1. Introductions
 - a. Owner Town of Seabrook
 - a. Curtis Slayton, Daumanic Fucile
 - b. Engineer Weston & Sampson
 - a. Jarod Stuyvesant, John Sykora
 - c. Funding Partially by ARPA Grant, partially by CWSRF no. CS-334178-04 (signage required at entrance to site during construction per NHDES Specification included in bid documents).

- a. Prevailing wage rates, AIS requirements, and DBE requirements apply
- b. DES made comments that a new wage rate was issued under Rockingham County. These are being provided in Addendum no. 2.
- c. There are no mandatory DBE requirements, but good faith efforts are required. The bid numbers used for sub-contractors for the DBE form will not be fixed, but used more as an estimate.
- d. Weekly certified payrolls will be required, using DES' "Elation" system through the online portal.

2. Bid Opening

- a. Bid Opening: Thursday, February 8 at 2:00 PM
- b. Location: Town of Seabrook Town Hall 99 Lafayette Rd, Seabrook, NH 03874
- 3. Project Description: The scope of work includes the removal of two belt filter presses in the existing Sludge Disposal Building, two centrifugal blowers, two sludge pumps, conveyors, piping, miscellaneous mechanical and electrical equipment, HVAC equipment, and other appurtenances. These will be replaced with two dewatering centrifuges, two polymer blending skids, two progressive cavity sludge pumps, two sludge grinders, two positive displacement blower packages, new HVAC equipment for the Sludge Disposal Building and Influent Building, miscellaneous plumbing and electrical upgrades, a new Sludge Disposal Master Control Panel, associated equipment control panels, a new electrical feed to the Sludge Disposal Building, and other appurtenances.
- 4. Project Duration:
 - a. Calendar Days: 486 consecutive days to substantial completion. 516 days to final completion.
 - b. Anticipated NTP Date: April, 2024.
 - c. The top priority is to get submittals ready and order the equipment.
- 5. Special Provisions & Site Access
 - a. Hours of Operation: The facility is staffed from 7am-3:00pm. Please obtain permission from Seabrook to work outside of these hours and arrange access to the facility through them.
 - b. Access for WWTF operations must be maintained at all times.
 - c. Outside of the timeframe of the temporary dewatering operations, the operations and treatment of wastewater shall not be disturbed.
- 6. Addenda
 - a. All questions must be submitted in writing via email to Jarod Stuyvesant (<u>Stuyvesant.jarod@wseinc.com</u>) by noon on Thursday, January 25, 2024.
 - b. Addendum no. 1 was issued earlier this week. There are a few questions that were submitted before the pre-bid meeting that will be addressed in the next addendum.
 - c. At a minimum, one more addendum will be issued for the minutes of this pre-bid conference. Please be sure to include and acknowledge this addendum (and any others) in your bid submittal package.
 - d. No addenda will be released after noon on February 6, 2024 (two days prior to the bid opening).



- 7. Additional Notes
 - a. Coordinate all electrical work with WWTF staff to ensure proper lockout/tagout procedures are followed.
 - b. Coordinate all staging with WWTF staff to ensure access to their facilities is maintained at all times.
 - c. Contractor will be responsible for the unloading of all delivered equipment and materials within the scope of the contractor's work. Please coordinate any storage locations with Seabrook staff.
 - d. Contractor shall be responsible for their own portable toilets. Any field office trailer location needs to be approved by the Owner. Powering of the field office trailer can be connected to existing electrical source on site, covered by Seabrook. It shall only include low voltage (120V) power for outlets, heat and A/C, computers, and other field officerelated items.

Additional Questions and Comments

- General Contractors shall please fill out the "Notice of Intent to Bid" form found on the Town of Seabrook's procurement portal on their website.
- Additional questions were encouraged to be submitted in writing to the Engineer. Responses to these questions are to be included in the addenda to follow.

Site Tour was Held



"General Decision Number: NH20240022 01/05/2024

Superseded General Decision Number: NH20230022

State: New Hampshire

Construction Type: Building

County: Rockingham County in New Hampshire.

BUILDING CONSTRUCTION PROJECTS (does not include single family homes or apartments up to and including 4 stories).

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(1).

<pre>If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022:</pre>	 Executive Order 14026 generally applies to the contract. The contractor must pay all covered workers at least \$17.20 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2024.
If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:	 Executive Order 13658 generally applies to the contract. The contractor must pay all covered workers at least \$12.90 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2024.

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at http://www.dol.gov/whd/govcontracts.

Modification	Number	Publication	Date
0		01/05/2024	

	Rates	Fringes
ASBESTOS WORKER/HEAT & FROST INSULATOR	\$ 42.80	35.16
BOIL0029-004 01/01/2021		
	Rates	Fringes
BOILERMAKER	\$ 38.08	25.70
BRNH0003-001 06/01/2020		
	Rates	Fringes
BRICKLAYER	\$ 42.55	28.02
ELEC0490-006 01/01/2023		
	Rates	Fringes
ELECTRICIAN (Includes Low Voltage Wiring and Alarm		
Installation)	\$ 33.30	22.05
ELEV0004-007 01/01/2023		
	Rates	Fringes
ELEVATOR MECHANIC	\$ 68.38 3	7.335+a+b
a. PAID HOLIDAYS: New Year's Da Day, Labor Day, Veterans' Day, Day and the Friday after Thanks	ay, Memorial Day Thanksgiving Da ggiving.	, Independence y, Christmas
b. VACATION: Employer contribut 5 years or more of service; 6% months to 5 years of service as	es 8% of basic of basic hourly vacation pay c	hourly rate for rate for 6 redit.
IRON0007-037 09/16/2023		
	Rates	Fringes
IRONWORKER (Reinforcing and Structural)	\$ 30.83	24.97
LABO0976-008 06/01/2023		
	Rates	Fringes
LABORER: Common or General	\$ 25.00	20.93
PLUM0131-004 06/05/2023		
	Rates	Fringes
PIPEFITTER	\$ 40.36	25.24
SUNH2015-008 06/16/2017		

Rates Fringes

CARPENTER, Includes Acoustical Ceiling Installation and Form Work (Excludes Drywall Hanging and Drywall Finishing/Taning\$ 24.47	8.55
CEMENT MASON/CONCRETE FINISHER\$ 22.04	9.70
DRYWALL FINISHER/TAPER\$ 25.00	0.00
DRYWALL HANGER, Includes Metal Stud Installation\$ 25.00	0.00
GLAZIER\$ 26.75	3.48
LABORER: Mason Tender - Brick\$ 16.52 **	4.74
OPERATOR: Backhoe/Excavator/Trackhoe\$ 24.02	4.25
OPERATOR: Crane\$ 27.42	3.83
OPERATOR: Loader\$ 22.25	2.13
OPERATOR: Roller\$ 23.56	3.28
PAINTER (Brush and Roller)\$ 18.10	1.58
PAINTER: Spray\$ 22.99	3.28
PLUMBER, Includes HVAC Pipe Installation\$ 26.72	5.56
ROOFER\$ 19.22	0.00
SHEET METAL WORKER, Includes HVAC Duct Installation\$ 24.88	5.46
SPRINKLER FITTER (Fire Sprinklers)\$ 31.29	9.78
WATERPROOFER\$ 26.69	0.00

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

** Workers in this classification may be entitled to a higher minimum wage under Executive Order 14026 (\$17.20) or 13658 (\$12.90). Please see the Note at the top of the wage determination for more information. Please also note that the minimum wage requirements of Executive Order 14026 are not currently being enforced as to any contract or subcontract to which the states of Texas, Louisiana, or Mississippi, including their agencies, are a party.

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at

https://www.dol.gov/agencies/whd/government-contracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (iii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of ""identifiers"" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour National Office because National Office has responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations Wage and Hour Division U.S. Department of Labor 200 Constitution Avenue, N.W. Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator U.S. Department of Labor 200 Constitution Avenue, N.W. Washington, DC 20210

The request should be accompanied by a full statement of the

interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board U.S. Department of Labor 200 Constitution Avenue, N.W. Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

END OF GENERAL DECISION"

SECTION 40 61 96

PROCESS CONTROL DESCRIPTIONS

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. This section includes control descriptions for process equipment and associated instrumentation, as described in the Process & Instrumentation Diagrams in the drawings.
- B. The Contractor shall furnish all instrumentation hardware, software, and programming as necessary to perform control functions specified herein and as shown on drawings. Ensure coordination with other work so that necessary wiring, conduits, contacts, relays, converters, and incidentals are provided to transmit, receive, and control necessary signals to other control elements, control panels, and receiving stations.
- 1.02 RELATED WORK:
 - A. DIVISIONS 26-46
- 1.03 SUBMITTALS:
 - A. In accordance with requirements of Section 01 33 23 Submittals, submit the following:
 - i. Annotated final versions of the PLC, operator interface terminal (display screens), and electronic SCADA programming files on a USB drive.

PART 2 - PRODUCTS

Not Used – Refer to Division 26 and Division 40 for material requirements.

PART 3 - EXECUTION

- 3.01 CONTROL DESCRIPTIONS, GENERAL:
 - A. This section describes the process control narrative for each piece of equipment and overall sludge disposal systems. The Contractor shall be responsible for providing and programming a central PLC-based control panel named Sludge Disposal Main Control Panel (SD-MCP). The centrifuges shall be supplied with a vendor control panel and PLC which shall communicate to the SD-MCP via ethernet connection. All other vendor-supplied panels or local push-button stations shall be hard-wired to the proposed SD-MCP.
- 3.02 DEWATERING SYSTEM:
 - A. Sludge Storage Tanks

- i. The Sludge Storage Tanks are fed via the existing Waste Activated Sludge Pumps that are located and controlled in a separate building. Manual valves are operated to direct flow into the desired tank.
- ii. Tank levels are measured via existing level sensors LIT-101 and LIT-102 for tanks 1 and 2, respectively. These signals shall be transferred to the new SD-MCP and used for alarms and shut-off control for the new Centrifuge Feed Pumps and Centrifuge System as a whole. This process is described in the Centrifuge Feed Pump and Centrifuge sections.
- B. Sludge Storage Tank Blowers
 - i. Proposed Blowers nos. 1 and 2 (control loops 305 & 306)
 - a) Each blower shall be operated on a VFD supplied with the blower.
 - b) The VFD shall have an HOA switch.
 - c) Alarm signals:
 - 1. VFD Fault
 - 2. High Temperature
 - d) Informational/Control signals:
 - 1. Run Status
 - 2. Speed Command
 - 3. Speed
 - 4. Amp Draw
 - 5. Start
 - 6. In Remote
 - ii. Existing Blower no. 3 (control loop 101)
 - a) The existing start switch at the existing control panel shall be replaced by an HOA switch. A start command signal shall be run to this panel, in addition to an "In Remote" signal back to SD-MCP from this new HOA switch.
 - b) This blower shall run at full speed when called to run, as there is no VFD.
 - c) Alarm signals:
 - 1. Inlet Bearing Vibration Warning
 - 2. Inlet Bearing Vibration High
 - 3. Inlet Bearing High Temperature
 - 4. Outlet Bearing Vibration Warning
 - 5. Outlet Bearing Vibration High
 - 6. Outlet Bearing High Temperature
 - 7. Surge
 - 8. High Current
 - d) Informational/Control signals:
 - 1. Run Status
 - 2. Start Command
 - 3. In Remote
 - iii. In AUTO, the blowers shall be operated as follows:
 - a) Operator shall select a LEAD blower, a LAG1 blower, and LAG2 blower via selector switches on the front of SD-MCP. (Existing Blower no. 3 shall be default LAG2 and shall only be called to run if the Lead or LAG1 is OFF or not in Automatic mode). Blowers no. 1 and no. 2 shall be automatically alternated between Lead and LAG1 every 30 days. This shall be adjustable in SD-MCP.

Operator may override this default setting by selecting a new Lead/Lag scenario at SD-MCP.

- b) Operator shall indicate which storage tanks are operational (default is both tanks operational) at the SD-MCP via a selector switch on the front of the panel.
- c) All blower discharge headers combine before splitting via manual valves to each storage tank. Storage tanks are generally run together, hydraulically connected and share similar water levels.
- d) Lead Blower shall run continuously at a speed based on storage tank levels (3 ft to 14 ft). As storage tank level signals from LIT-101 and LIT-102 drops, blower shall slow down. As level increases, blower speed shall increase. The level setpoints shall be adjustable in SD-MCP.
- e) If either tank level surpasses 14 feet, the LAG1 blower shall turn on. This level setpoint shall be adjustable in SD-MCP.
- f) If either tank level drops below 2 feet, the Lead blower shall shut off, and SD-MCP shall transmit a low-level alarm to SCADA. This level setpoint shall be adjustable in SD-MCP.
- g) In HAND mode, the blower shall run at the speed set by the manual speed control dial at the VFD.
- C. In-Line Sludge Grinders no. 1 and 2 (Control Loops 301 and 303)
 - Each sludge grinder is provided with a vendor-supplied Local Control Panel with 110V direct contact relays.
 - ii. Each local control panel has a Hand-Off-Auto (HOA) switch.
 - iii. In AUTO, the grinders shall operate under the following conditions:
 - a) Sludge Grinder no. 1 (Loop 301) shall be synchronized to the run status of Centrifuge Feed Pump no. 1.
 - b) Sludge Grinder no. 2 (Loop 303) shall be synchronized to the run status of Centrifuge Feed Pump no. 2.
 - c) Each sludge grinder shall be called to run when its respective Centrifuge Feed Pump is called to run.
 - d) Each sludge grinder shall be turned OFF when its respective Centrifuge Feed Pump is turned OFF.
 - iv. In HAND mode, the grinders shall turn ON until the HOA switch is moved to OFF or AUTO.
 - v. Alarm signals:

i.

- a) Jammed Fault
- b) Motor Fault
- c) High Temperature
- vi. Informational/control signals:
 - a) Power
 - b) Run Status
 - c) In AUTO
 - d) Start command
- D. Centrifuge Feed Pumps no. 1 and 2 (Control Loops 302 and 304)
 - i. Each pump shall be operated on a VFD.
 - ii. Each pump shall have a local pushbutton station located at the pump.
 - a) Pushbutton station includes an HOA switch. When set to AUTO, the pump shall be controlled based on VFD status.

- b) When in HAND, the pump shall run at the speed set manually at the VFD.
- c) The pushbutton station also has an emergency stop button.
- d) If the pushbutton station is set to OFF or HAND, the pump shall not be able to be controlled by the VFD or SD-MCP.
- iii. The VFD shall have an HOA switch.
 - a) In Auto:
 - 1. The pumps shall be called to run and stop based on commands generated by the Centrifuge Control Panels (CF-CP1 or CF-CP2). Refer to the Centrifuge Control Description (Section E) for more information.
 - 2. Operator shall use SD-MCP to select one or both Sludge Storage Tanks to be active (default is both are active).
 - 3. Pump speed shall be controlled using a setpoint from the Centrifuge Control Panels (CF-CP1 or CF-CP2) via a PID loop to adjust VFD speed to match the flow rate displayed in FIT-320 for Pump/Centrifuge no. 1 and FIT-322 for Pump/Centrifuge no. 2.
 - 4. Each pump shall run within the speed limits set manually at the VFD.
 - 5. The SD-MCP shall generate an alarm if the set flow rate cannot be achieved by the selected pump and its dedicated flow meter within an operator adjustable time period.
- iv. Permissives/Interlocks:
 - a) Each pump is equipped with a temperature and pressure switch. If either of these are triggered, the pump shall shut down and give an alarm.
 - b) If the active storage tank level(s) are below 1 ft (from LIT-101 or LIT-102), the pumps shall turn off if ON, or prohibited to start, if OFF.
- v. Alarm signals:
 - a) VFD Fault
 - b) High Temperature
 - c) High Pressure
- vii. Informational/control signals:
 - a) Speed
 - b) Run Status
 - c) In Remote (VFD)
 - d) In Remote (Pushbutton)
 - e) Amp draw
 - f) E-stop engaged
 - g) Start command
- E. Centrifuge System (Control loops 307-310)
 - i. Centrifuges shall be provided with a vendor-supplied control panel (CF-CP1 and CF-CP2) for each centrifuge. These shall both be connected to the SD-MCP via ethernet connections. Polymer dosing systems shall be supplied by the centrifuge supplier and controlled directly via the Centrifuge Control Panels. An additional Operator Interface Terminal (CF-OIT1 and CF-OIT2) shall be provided by the centrifuge supplier, which shall be connected to CF-CP1 or CF-CP2 via ethernet connection. These CF-OITs shall have HMI touchscreens that shall be used to operate the centrifuges in addition to the CF-CPs.
 - ii. The Centrifuges shall be operated by the following sequence:

- a) The Operator selects a centrifuge to run (no. 1 or no. 2)
 - 1. There shall be a physical selector switch with a lockable handle on the wall near the Control Panels that will indicate which centrifuge control panel has 480V power. Each centrifuge control panel shall be capable of controlling the related systems as described herein, such as both feed pumps, both polymer systems, and be able to read both flow meters and both solids meters.
 - 2. There shall never be any scenario where both centrifuges are running at the same time.
- b) The Operator selects a Centrifuge Feed Pump (no. 1 or no. 2) to feed the centrifuge. (Associated sludge grinder and active storage tanks are set in SD-MCP). Default is that pump no. 1 feeds centrifuge no. 1, etc. Operator shall adjust the manual valves in basement if the corresponding number of feed pump is different from the centrifuge (i.e. pump 1 feeding centrifuge 2).
- c) The Operator sets a flow rate for centrifuge feed (50-250 GPM).
- d) The Operator selects a polymer feed system (skid no. 1 or no. 2). Default is that system no. 1 feeds centrifuge no. 1, etc. Operator shall adjust the manual interconnecting valves on the polymer lines if the corresponding number of polymer feed system is different from the centrifuge (i.e. system 1 feeding centrifuge 2).
- e) The Operator sets a polymer flow rate (0-100%).
- f) The Operator sets a duration (in minutes) for the centrifuge to run.
- g) The Operator presses "Start".
- h) CF-CP1 (or CF-CP2) communicates through Ethernet with SD-MCP to check if selected Centrifuge Feed Pump and its associated sludge grinder are in AUTO and no alarms are present. If pump or grinder is not in AUTO or any alarm is present, a message is given at the CF-CP1 (or CF-CP2) and the startup sequence cannot be initiated.
- i) If all permissives in SD-MCP are clear, CF-CP1 (or CF-CP2) initiates the startup sequence:
 - 1. Centrifuge is called to start CF-CP1 (or CF-CP2).
 - 2. Feed Pump is called to run (CF-CP1 (or CF-CP2) through SD-MCP).
 - i. Associated sludge grinder is called to run (SD-MCP).
 - 3. Flush and CIP water valves shall be controlled via the following:
 - i. Flush water valve(s) called to open (SD-MCP) whenever Centrifuge is in "Flush" mode, as determined by CF-CP1 (or CF-CP2) sequence.
 - ii. CIP water valve(s) called to open (SD-MCP) whenever Centrifuge is in "CIP" mode, as determined by CF-CP1 (or CF-CP2) sequence.
 - 4. Selected Polymer blending unit called to run CF-CP1 (or CF-CP2).
 - 5. Conveyor no. 1 and no. 2 called to run (SD-MCP). Refer to Conveyor control section.
 - 6. Centrifuge runs for set time or until operator turns the process OFF, unless unexpected shutdown occurs.

- j) Centrifuge Operation PID Loops:
 - 1. Logic within SD-MCP: The Centrifuge Feed Pump shall modulate speed to match the set flow rate at the CF-CP1 (or CF-CP2). Magnetic flow meters FIT-320 and FIT-322 shall be used for Centrifuge 1 and 2, respectively.
 - 2. Logic within CF-CP1 (or CF-CP2): feed sludge total solids content signals shall be transmitted from SD-MCP (0-2%) from solids meters AIT-321 and AIT-323 for Centrifuges 1 and 2, respectively. This shall be used to control the polymer dosing speed. The default setting shall be 50% polymer dosing at 0.50% total solids. Polymer speed shall proportionally modulate from 0 to 100% based on 0 to 2% solids. This shall be adjustable in the CF-CP.
- k) Scenarios that cause a Centrifuge shutdown:
 - 1. Operator initiates a routine shutdown at CF-CP1 (or CF-CP2) after processing OR centrifuge processing timer runs out.
 - 2. Any pre-programmed fault/alarm in the vendor-supplied Centrifuge Panel CF-CP1 (or CF-CP2)
 - 3. Active Sludge Storage Tank level(s) is below 1 ft via level sensors LIT-101 and LIT-102 (SD-MCP to relay a signal to centrifuge panel when pumps are shut down).
 - 4. Selected Centrifuge Feed Pump turns OFF.
 - 5. Either conveyor no. 1 or no. 2 turns OFF or displays "Zero Speed."
 - 6. All 3 level sensors in dumpster bay are at their maximum level (LIT-301, LIT-302, LIT-303).
 - 7. All three automated cake chute gates (AG-301, AG-302, AG-303) are closed for 60+ seconds.
- I) Centrifuge Shutdown Sequence (either planned or unplanned):
 - 1. Polymer System is turned OFF CF-CP1 (or CF-CP2).
 - 2. Feed Pump and Sludge Grinder are turned OFF (SD-MCP).
 - 3. Centrifuge begins "wash down cycle" CF-CP1 (or CF-CP2).
 - i. Flush water valve(s) called to open (SD-MCP) whenever Centrifuge is in "Flush" mode, as determined by CF-CP1 (or CF-CP2) sequence.
 - ii. CIP water valve(s) called to open (SD-MCP) whenever Centrifuge is in "CIP" mode, as determined by CF-CP1 (or CF-CP2) sequence.
 - 4. Conveyors initiate 5-minute timer to shut down (SD-MCP).
 - 5. Centrifuge finishes wash-down cycle and turns OFF (CF-CP).
- F. Screw Conveyor Systems (Control Loops 311 and 312)
 - i. The screw conveyors shall be controlled and monitored by SD-MCP.
 - ii. SD-MCP shall call the conveyors to turn ON as described in Section E (Centrifuge System).
 - iii. When the conveyors are called to run, they shall be started at full speed. There are no VFDs.
 - iv. Centrifuges nos. 1 and 2 both discharge cake into Screw Conveyor no. 1.
 - v. Screw Conveyor no. 1 discharges into Screw Conveyor no. 2.

- vi. Screw Conveyor no. 2 has three discharge chutes, each one with an automatic electrically actuated knife gate.
- vii. Near each of the 3 discharge chutes, there shall be a radar level sensor (LIT-301, LIT-302, LIT-303). These shall be used to determine the level of cake in the dumpster under each chute.
- viii. The knife gates shall be controlled by SD-MCP and operated as follows:
 - a) When the Screw Conveyors are OFF, all 3 gates shall be OPEN.
 - b) When Screw Conveyors are called to run, Gates AG-301 and AG-302 shall be closed.
 - c) If the level given by LIT-303 reaches its maximum setpoint (adjustable in SD-MCP), AG-302 shall OPEN. 30 seconds later, AG-303 shall CLOSE.
 - d) If the level given by LIT-302 reaches its maximum setpoint, AG-301 shall OPEN. 30 seconds later, AG-302 shall CLOSE.
 - e) If the level given by LIT-301 reaches its maximum setpoint, the gate with the lowest level that is not above its maximum setpoint shall open. 30 seconds later, AG-301 shall close.
 - f) If all level sensors are reading at or above their maximum setpoint, an alarm shall be generated, and the centrifuge system shall be shut down.
 - g) When the centrifuge system is in shutdown mode and the 5-minute timer begins for the Conveyor shutdown, all three gates shall OPEN.
 - ix. Permissives/Interlocks
 - a) If all three gates are closed, system shall shut down, and call for Centrifuge shutdown.
 - b) If all three level sensors are at or above their maximum setpoint, the systems shall be shut down.
 - x. Alarm Signals (typical 2 conveyors):
 - a) Emergency stop engaged.
 - b) Zero speed
 - xi. Informational/Control signals (typical 2 conveyors):
 - a) Run Status

END OF SECTION

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SECTION 43 11 33

ROTARY LOBE BLOWERS

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. The Contractor shall furnish, install and test belt-driven rotary positive displacement blower packages complete with all appurtenances as indicated on the drawings and as herein specified.
- B. The entire blower package and its components shall comply with all applicable safety and environmental regulations.
- 1.02 RELATED WORK:
 - A. Section 01 75 00, STARTUP AND TESTING
 - B. Section 01 75 13, EQUIPMENT CHECKOUT AND TESTING
 - C. Section 03 30 00, CAST-IN-PLACE CONCRETE
 - D. Section 09 90 00, PAINTING
 - E. Division 26, ELECTRICAL
 - F. Section 40 91 00, FIELD INSTRUMENTS AND EQUIPMENT
 - G. Section 40 05 13.19, STAINLESS STEEL PROCESS PIPE AND FITTINGS

1.03 SYSTEM DESCRIPTION:

The blower packages shall be designed and manufactured to suit the arrangement shown on the drawings. If the equipment furnished has different connections than those indicated, the Contractor shall submit a piping layout of the necessary changes for the approval of the Engineer. Revisions to the structure or to other work resulting from such different connections shall be at the expense of the Contractor.

1.04 QUALITY ASSURANCE:

- A. All Equipment Shall Conform to The Following Criteria
 - 1. 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 are 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 performance data and manufacturing methods shall achieve a Declaration of Conformity, per Machinery Directive 2006/42/EC, Annex II, No.1 A
- 4. Equipment shall be a manufacturer's standard product presently in commercial production.
- 5. All the equipment specified under this Section shall be furnished by a single supplier and shall be products of manufacturers regularly engaged in the production of said equipment. The supplier shall have the sole responsibility for proper functioning of the complete blower system.
- 6. Any reference to a specific manufacturer or model number is for the purpose of establishing a quality or parameter for specification writing and is not to be considered proprietary. In all cases any source or device that has the quality and operating capabilities specified may be acceptable.
- 7. Conform to requirements for materials, installation and equipment approvals of state, local, Underwriter's Laboratories, Inc., or other applicable codes, whether called for on the drawings or in the specifications.
- 8. Workmanship shall be first class in all respects.
- 9. Base the use of unspecified materials on their continuous and successful employment under similar conditions, as called for in this section.
- B. Manufacturer's Qualifications
 - 1. Upon request from the Engineer, the manufacturer shall demonstrate proof of financial responsibility with respect to performance and delivery date.
 - 2. Upon request from the Engineer, the manufacturer shall provide proof or evidence of facilities, equipment and skills required to produce the equipment specified herein.
 - 3. As described in Section 01 75 13 under "Services of Manufacturer's Representative," the manufacturer shall provide the supervisory service of a factory trained engineer, who is specifically trained on type of equipment supplied, for a period of not less than two 8-hour days to assist in installation of the equipment, and related appurtenances, to provide initial startup and to instruct the Owner's operating personnel in the operation and maintenance of the equipment provided.
- C. Factory Tests

The motors and controls shall be given an operational test in accordance with the standards of the Hydraulic Institute. Recordings of the test shall substantiate the correct performance

of the equipment at the discharge pressure, capacity, speed and horsepower as herein specified.

D. Field acceptance tests shall be performed as specified in Part 3 EXECUTION.

1.05 REFERENCES:

A. The latest editions of the following standards form a part of this specification:

American National Standard Institute (ANSI)

ASTM International (ASTM)

National Electric Code (NEC)

1.06 SUBMITTALS:

In accordance with requirements of general specifications, submit the following:

- A. Shop Drawings and Product Data
 - 1. Shop drawings including manufacturer's data sheets, showing illustrated cuts of the item(s) with scale details, sizes, dimensions, capacities, performance characteristics, wiring diagrams, controls, and other pertinent information shall be submitted to the Engineer for review. If more than one size or type is shown, the proposed items shall be clearly indicated.
 - 2. Provide descriptive literature, bulletins, and/or catalog cuts for each item of equipment.
 - 3. Provide data on the characteristics and performance of all blowers and motors. Blower data shall include guaranteed performance curves, based on actual shop tests of similar units, which show that they meet the specified requirements for head, capacity, efficiency, and horsepower. Curves shall be submitted on 8-1/2-inch by 11-inch sheets.
 - 4. 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
 - 5. List of recommended spare parts broken down into on-hand and long-term parts for two years and three to five years operation.

- 6. Provide the total weight of each item of equipment including the weight of the single largest component of each item.
- 7. 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.
- 8. Provide a complete total bill of materials for all equipment.
- 9. Certified general arrangement drawings showing materials, details of construction, dimensions, and connections.
- B. Design Data
 - 1. Provide complete wiring diagrams and schematics of all controllers, control devices, and operators stations furnished under this Section.
 - 2. Provide complete wiring diagrams and schematics of all power and control systems including connections to work of other Sections.
- C. Submit details on all items required in other specification Sections which are to be supplied and installed as part of the blower packages specified in this Section.
- D. In the event that it is impossible to conform with certain details of the specifications due to different manufacturing techniques, describe completely all nonconforming aspects.
- E. Operation and Maintenance Manuals

The Contractor shall provide four (4) copies of Operation & Maintenance Manuals in accordance with Section 01 92 13 of this specification. The manufacturer shall be responsible for supplying written instructions, which shall be sufficiently comprehensive to enable the operator to operate and maintain the equipment supplied by the manufacturer. Said instructions shall assume that the operator is familiar with blowers, motors, piping, and valves, but that they have not previously operated and/or maintained the exact equipment supplied.

These instructions shall be prepared as a systems manual applicable solely to the blowers and equipment supplied by the manufacturer to these specifications, and shall include those devices and equipment supplied by it. However, items of equipment for which the manufacturer has made mounting or other provisions, but which it has not supplied, may be excluded from these instructions.

1.07 BLOWER PERFORMANCE CRITERIA:

- 1. Design Inlet Temperature
- 2. Site Elevation
- 3. Design Inlet Pressure

100 °F 25 feet above sea level 14.68 psia

- 4. Design Flow
- 5. Minimum Turndown
- 6. Design Discharge Pressure
- 7. Maximum Blower Speed
- 8. Brake Horsepower (Max)
- 9. Motor Size (Max)
- 10. Free Field Noise Guarantee

646 icfm per machine
323 icfm per machine
6.0 psig
4,000 RPM @ 80% of maximum
30 bHp
40 Hp
75 dB(A) at 1 meter (at design point)

- A. Package BHP to include pressure loss through a clean inlet filter / silencer, pressure loss of the exhaust silencer and check valve.
- B. 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.
- C. 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.
- 1.08 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
 - 2. Spare parts shall be properly bound and labeled for easy identification without opening the packaging.
- 1.09 DELIVERY, STORAGE, AND HANDLING:
 - A. Ship equipment and material complete except where partial disassembly is required by transportation regulations or for protection of components.
 - B. All equipment shall be factory assembled, skid mounted, crated, and delivered to protect against damage during shipment.
 - C. Receive, store, and safeguard all equipment and materials at the job site.
- 1.10 WARRANTY:

The Contractor shall be responsible for obtaining the manufacturer's warranty, providing that the blower packages shall be of quality construction, free from defects in material and workmanship.

- 1. Components failing to perform as specified by the Engineer, or as represented by the manufacturer, or proven defective in service during the warranty period, shall be replaced, repaired, or satisfactorily modified by the manufacturer without cost of parts or labor to the Owner.
- 2. 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.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

- A. The physical layout of the blowers shown on the drawings and specified herein are based upon the equipment manufactured by Aerzen USA Corporation. The manufacturer shall develop a layout consistent with the contract drawings and specifications to be reviewed by the Engineer during the review of shop drawings.
- B. If other equipment is proposed, the Contractor shall demonstrate to the Engineer that all requirements of materials, performance and workmanship have been met or exceeded by the equipment proposed.
- C. Revisions to the structure or to other work resulting from the other proposed equipment shall be at the expense of the Contractor, including revised layout of pads, piping, and all other components
- 2.02 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 pad without grouting the base frame. There shall only be 4 easily accessible anchor points.
 - C. Manufacturer shall guarantee that the rotary lobe blower shall provide oil-free operation and be certified to ISO 8573-1 Class Zero
 - D. 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 1/2 "/ sec RMS when operating at the specified maximum operating pressure and speed in the actual blower package.
- E. Factory Testing
 - 1. 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.
 - 2. The acceptance criteria are +5% tolerance on power and -5% tolerance on flow regardless of the size of the machine.
- F. 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.
- G. 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.
- H. 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.
- I. 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.
- J. Lubrication
 - 1. The timing gears and the bearings shall be splash lubricated. Grease lubrication shall be not acceptable.
- K. Oil Sight Glass
 - 1. A recessed oil sight glass must be provided on each oil sump.
 - 2. Protruding sight glasses shall not be acceptable.
- L. 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 70□m. Surface preparation SSPC10 or better.
 - e. Sound enclosure shall be powder-coated polyester base total dry film thickness $80\Box m$.
 - f. Galvanized components shall only be painted with appropriate surface preparation

2.03 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.
 - 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 and upstream of the inlet silencer. Flexible connectors to be provided by Blower Supplier.
 - 2. Flexible connectors shall prevent the transmission of noise and vibrations from the blower package into the piping.
 - 3. Flexible inlet 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.
- D. Electric Motor
 - 1. Each package shall be supplied with a TEFC motor that shall operate on 460 Volts, 3 Phase, 60 Hertz current, 1775 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 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. 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.
- F. 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.
- G. 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.
- H. 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. If the blower package is supplied with a sound enclosure. The pressure relief valve shall be housed by the sound enclosure and shall relieve into a segmented section of the sound enclosure. Weighted relief valves inside in the enclosure are not permitted.
- I. 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.
- J. Variable Frequency Drive and Controls
 - 1. Variable Frequency Drive
 - a. Each blower package shall include a factory mounted, 6-pulse, constant torque, variable frequency drive.
 - b. Drive shall operate on 460 VAC, 3 phase, 60 hertz power and shall be integrated with the local blower permissive switches.
 - c. The drive shall include the following features and accessories:
 - i. NEMA 12 enclosure for indoor installation
 - ii. Rotary fused disconnect (size to be confirmed by blower manufacturer)
 - iii. Method to minimize power line harmonics while providing a near unity power factor.
 - iv. Input surge protection to withstand surges of 2.3 times line voltage for 1.5 msec.
 - v. Modbus communication over CAT5 cable.
 - vi. Modbus communication over CAT rating.

- vii. Dry contact relays for digital and analog inputs/outputs as required.
- 2. Each package shall be supplied with the following control functions and features on the integrated Control Panel supplied with each Blower (Aerzen Aertronics or equal):
 - a. Screen display with pushbuttons for controls/monitoring.
 - b. HOA Switch for remote operation (via SD-MCP).
 - c. Display, monitoring, alarm, and shutdown of inlet pressure, discharge pressure, discharge temperature, main drive motor thermal overload
 - d. Display run hours
 - e. Log errors and first out indication
 - f. Track and log maintenance
 - g. E-Stop button mounted on front of blower enclosure
 - h. Operation of enclosure cooling fan motor starter and oil demister
 - i. Terminal block for required inputs/outputs..
 - j. The register list shall be providing the following as a minimum for display at the Control Station:
 - i. Power Failure
 - ii. Fault, Emergency Stop
 - iii. Fault, main motor controller overload (relayed from motor controller)
 - iv. Fault, main motor thermal overload
 - v. Fault, high suction pressure
 - vi. Fault, high discharge pressure
 - vii. Fault, high discharge temperature
 - viii. Fault, suction pressure senor failure
 - ix. Fault, discharge pressure sensor failure
 - x. Fault, discharge temperature sensor failure
 - xi. Warning (Alarm), high suction pressure
 - xii. Warning (Alarm), high discharge pressure
 - xiii. Warning (Alarm), high discharge temperature
 - xiv. Maintenance needed suction filter

- xv. Maintenance needed v-belt
- xvi. Maintenance needed lubrication oil
- xvii. Maintenance needed motor lubrication
- xviii. Time remaining suction filter
- xix. Time remaining v-belt
- xx. Time remaining lubrication oil
- xxi. Time remaining motor lubrication
- xxii. Total Time of operation
- xxiii. Machine Ready
- xxiv. Machine Waiting (reset timer)
- xxv. Machine Standby
- xxvi. Machine Start Phase
- xxvii. Machine Operating
- xxviii. Total suction pressure
 - xxix. Discharge pressure
 - xxx. Discharge temperature
- k. Permissive control function of customer start and stop signals to a motor controller
- 1. Digital potentiometer (EM4 Module)
 - i. LOCAL Operation: speed control of the VFD via the HMI screen.
 - ii. REMOTE Operation: transfer of VFD speed command from external controller to the VFD
 - iii. These signals can be communicated using either hard wire connection or the communication protocol
- m. The blower package controller shall be provided with the following digital outputs:
 - i. Common alarm
 - ii. Common fault
 - iii. Ready to run
 - iv. Transfer of external start/stop command
 - v. Status remote
 - vi. High Temperture
 - vii. High Pressure
- n. The blower package shall be provided with the following analog outputs:

- i. Speed
- ii. Amp Draw
- o. The blower package shall be provided with the following digital inputs:
 - i. Remote start/stop
- p. The blower package shall be provided with the following analog inputs:
 - i. Speed command
- q. The blower package shall have an E-stop at each unit.
- 3. Monitoring Sensors
 - a. Inlet Pressure Transducer
 - b. Discharge pressure Transducer
 - c. PT 1,000 Discharge Temperature RTD
- 4. E-Stop Switch
 - a. Siemens model 52PX2V2
 - b. Mounted on the face of the blower enclosure
 - c. NEMA 4X rating
- I. Each blower shall receive its initial oil filling at the factory. Oil to be fully synthetic rated for 16,000 hrs of operation under normal operating conditions.
- J. Acoustical Sound Enclosure
 - 1. Each package shall be supplied with a sound enclosure covering the entire blower package.
 - 2. The enclosure shall provide suitable protection for outdoor installation under the specified site conditions (wind load and snow load).
 - 3. The enclosure shall be designed so as to be able to install them side-by-side with all maintenance done from the front or back of the package.
 - 4. Details shall be as follows:
 - a. Panels shall be made of galvanized steel sheet, powder coated per RAL 5001.

- b. The enclosure and the blower package shall both be mounted on a skid / oil-drip pan designed for meeting environment protection standards and for easy transportation and installation.
- c. A grounding strap shall be installed between the blower base and the package skid to bypass any vibration isolating mounts.
- d. Quick release panels, each less than 50 lb (as mandated by MSHA) must provide easy and quick access for routine maintenance of the blower and the package components.
- e. Enclosure Cooling Fan:
 - a. A high efficiency blower shaft driven ventilation fan shall provide ventilation and cooling integral to the sound enclosure.
 - b. Cooling fan shall be sized for sufficient heat removal from the sound enclosure, even when the blower is operated with a VFD.
- f. Electrical components, instrumentation and instrument connections shall not be mounted or interface with moving panels of the sound enclosure.
- g. Both blower oil sumps shall be piped to a common fill and drain, located at the front of the package for easy maintenance. An oil level indicator shall be mounted on the outside of the enclosure, which gives an accurate oil level indication while the blower is in operation. All oil lines to be hydraulic hose with fittings. No plastic tubing with compression fittings is allowed.
- L. External Inlet Silencer
 - 1. Each package shall include an external inlet silencer shipped loose for installation by the contractor on the building exterior.
 - 2. The unit shall be finished with baked-on enamel and shall be equipped with an epoxy coated wire mesh element for the purpose of preventing large debris and wildlife from entering the inlet pipe connection. Final filtration of the process air will be accomplished local to the blower package.

PART 3 - EXECUTION

3.01 INSTALLATION:

A. Installation of the blower packages and related appurtenances shall be performed in accordance with all written instructions furnished by the manufacturer.

- d. After installation, Contractor shall clean all surfaces damaged in shipment or installation and shall touch up in the field with the same materials as original coatings.
- e. The Contractor shall install the blowers in accordance with the Manufacturer's written instructions.
- f. The Contractor shall make all electrical and process connections to the blower package prior to the arrival of the manufacturer's representative.
- g. The Contractor shall complete and return the Manufacturer's installation check list prior to having a Manufacturer's representative come onsite.
- h. Representatives of the blower manufacturer shall verify and adjust blower and motor alignment.

3.02 FIELD ACCEPTANCE TESTS:

- A. After installation of all equipment has been completed and as soon as conditions permit, the manufacturer shall provide one (1) trip for a total of two (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.
- C. Start-up and testing shall be conducted in accordance with Section 01 75 00, STARTUP AND TESTING.
- D. Notify Engineer in writing at least three days in advance of the tests. If testing cannot be conducted because of scheduling, unavailable service personnel, etc., the Engineer's fees for a second visit shall be paid by the Contractor.
- E. All defects or defective equipment shall be corrected or replaced promptly at the Contractor's expense.

- F. All final adjustments necessary to place the equipment in satisfactory working order shall be made prior to the tests.
- G. All labor and materials necessary for the test shall be furnished by the Contractor.
- H. After installation, all piping shall be tested for tightness in an approved manner. Should leaks be found, faulty joints shall be repaired, even to the extent of disassembling and remaking the joint, and all defective pipe and fittings shall be removed and replaced in a manner satisfactory to the Engineer.
- I. 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.
- J. Manufacturer shall provide a written field test / start up report after completion of testing.

END OF SECTION

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FIRST FLOOR PLAN - EL. 11.5'

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PUMP GALLERY - EL. 0.0

	DRAWING NOTE: 1. REFER TO DRAWING E001 FOR LEGEND, ABBREVIATIONS, GENERAL NOTES AND DEMOLITION NOTES.	Project: WASTEWATER TREATMENT FACILITY UPGRADES 274 NH-286, SEABROOK, NH 03874
	DUIT ER SHALL XACT /INGS.	TOWN OF SEABROOK, NEW HAMPSHIRE
JKS		Weston & Sampson Engineers, Inc. 55 Walkers Brook Drive, Suite 100 Reading, MA 01867 978.532.1900 800.SAMPSON
PF-1 PF-2		www.westonandsampson.com Consultants:
JEL OIL ORAGE ROOM		
SLUDGE PUMP TO BE (REFER TO IN NOTE 10 NG E001) SLUDGE PUMP TO BE		Revisions: No. Date 2 01/31/24 ADDENDUM NO.3
(REFER TO ON NOTE 10 NG E001)		
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<u>0'</u>		Issued For:
		Scale: 3/16" =
		NORTH
		Date:01/04/2024Drawn By:HAReviewed By:DMApproved By:RFMW&S Project No :EN/C22.0322
		Was File No.: XXX
	BID ALTERNATE NOTE: FOR THE BID ALTERNATE UNDER "ITEM 3" IN SPECIFICATION SECTION 01 22 00 MEASURMENT AND PAYMENT, THE WORK THAT IS EXCLUDED IS NOTED WITH THE FOLLOWING DASHED LINE INDICATING THE BOUNDARY OF WORK THAT IS NOT INCLUDED FOR BID ALTERNATE "ITEM3". ALL ASSOCIATED ELECTRICAL, STRUCTURAL, AND/OR ARCHITECTURAL MODIFICATIONS SHALL BE EXCLUDED IN THIS BID ALTERNATE AS WELL.	SLUDGE DISPOSAL BUILDING ELECTRICAL PUMP ROOM AND FIRST FLOOR DEMOLITION PLANS
		Sheet Number: ED100



1 Sludge Disposal Building Pump Gallery Process Plan E201 NOT TO SCALE

	DRAWING NOTES: 1. REFER TO DRAWING E001 FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES	Project: WASTEWATER TREATMENT FACILITY UPGRADES 274 NH-286, SEABROOK, NH 03874 FABROOK , NH 03874 FOWN OF SEABROOK , NEW HAMPSHIRE
LIME SILO		Weston & Sampson Engineers, Inc. 55 Walkers Brook Drive, Suite 100 Reading, MA 01867 978.532.1900 800.SAMPSON www.westonandsampson.com
ÆR ET M-15		Consultants:
AGE_RM		No. Date Description 2 01/31/24 ADDENDUM NO.3
IK PE P) UNEXCAVATED		Seal:
SUPPORT(TYP) FILL IL SH. G-12		ISSUED FOR BID Scale: NTS Key Plan:
	BID ALTERNATE NOTE: FOR THE BID ALTERNATE UNDER "ITEM 3" IN SPECIFICATION SECTION 01 22 00 MEASURMENT AND PAYMENT, THE WORK THAT IS EXCLUDED IS NOTED WITH THE FOLLOWING DASHED LINE INDICATING THE BOUNDARY OF WORK THAT IS NOT INCLUDED FOR BID ALTERNATE "ITEM"3". ALL ASSOCIATED ELECTRICAL, STRUCTURAL, AND/OR ARCHITECTURAL MODIFICATIONS SHALL BE	NORTH PDate:01/04/2024Date:HADrawn By:HAReviewed By:DMApproved By:RFMW&S Project No.:ENG22-0322W&S File No.:XXXDrawing Title:SLUDGGE DISPOSAL BUIDLING ELECTRICAL PUMP GALLERY POWER PLAN NEW WORKSheet Number:
	IS EXCLUDED IS NOTED WITH THE FOLLOWING DASHED LINE INDICATING THE BOUNDARY OF WORK THAT IS NOT INCLUDED FOR BID ALTERNATE "ITEM3". ALL ASSOCIATED ELECTRICAL, STRUCTURAL, AND/OR ARCHITECTURAL MODIFICATIONS SHALL BE EXCLUDED IN THIS BID ALTERNATE AS WELL.	Sheet Number: E201











2 Influent Building Second Floor Demolition Power plan E204 NOT TO SCALE







	Project: WASTEWATER TREATMENT FACILITY UPGRADES 274 NH-286, SEABROOK, NH 03874 SEABROOK, NH 03874 UPGRADES 274 NH-286, SEABROOK, NH 03874 TOWN OF SEABROOK, NH 03874				
	Weston & Sampson Engineers, Inc. 55 Walkers Brook Drive, Suite 100 Reading, MA 01867 978.532.1900 800.SAMPSON www.westonandsampson.com				
	Consultants:				
	Revisions:				
	1 01/16/24 ADDENDUM NO.1 2 01/31/24 ADDENDUM NO.3				
	Seal:				
	ISSUED FOR BID				
	Scale: As indicated Key Plan:				
	NORTH				
	Date: 01/04/2024 Drawn By: HA				
	Approved By: RFM				
	W&S Project No.: ENG22-0322 W&S File No.: XXX				
	Drawing Title: INFLUENT BUIDLING ELECTRICAL SECOND FLOOR NEW WORK POWER PLAN				
8'	E204				

0' 2' 4'

SCALE: 1/4" = 1'-0"





CHEDULE								
OUIT & WIRE SIZE	THERMAL MOTOR SWITCH	MOTOR STARTER	VFD	RECEPTACLE	JUNCTION BOX	NON-FUSED DISCONNECT	FUSED DISCONNECT	NOTES
.,3#12&1#12GND							Х	
.,3#12&1#12GND							Х	
.,3#12&1#12GND							Х	
.,2#12&1#12GND	Х				Х			
.,3#12&1#12GND							Х	





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HOA = 1 $HOA = 1$	SLUDGE DISPOSAL MAIN CONTROL PANEL (SD-MCP)	Project: WASTEWATER TREATMENT FACILITY UPGRADES 274 NH-286, SEABROOK, NH 03874
TO CENTRIFUGE NO. 2 SEE SHEET 1102		Consultants:
		No. Date Description Image: Description Image: Descriptint Image: Descripti
		Seal: Issued For: ISSUED FOR BIDDING Scale: AS NOTED
		Date:01 / 04 / 2024Drawn By:JSSReviewed By:JMSApproved By:CMPW&S Project No.:ENG22-0322W&S File No.:CMP
[20	BID ALTERNATE NOTE: FOR THE BID ALTERNATE UNDER "ITEM 3" IN SPECIFICATION SECTION 01 22 00 MEASUREMENT AND PAYMENT, THE WORK THAT IS EXCLUDED IS NOTED WITH THE FOLLOWING DASHED LINE INDICATING THE BOUNDARY OF WORK THAT IS NOT INCLUDED FOR BID ALTERNATE "ITEM 3". ALL ASSOCIATED ELECTRICAL, STRUCTURAL, AND/OR ARCHITECTURAL MODIFICATIONS SHALL BE EXCLUDED IN THIS BID ALTERNATE AS WELL.	Drawing Title: P&ID SLUDGE PUMPS AND BLOWERS Sheet Number: I101



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