
City of Portland, Indiana
Wet Weather Pump Station
Contract 4A

ADDENDUM 4

February 27, 2024

Planholders on the City of Portland, Indiana, Wet Weather Pump Station Contract 4A are hereby notified of the following amendments to the Contract Documents. This Addendum is hereby made a part of the Contract Documents.

SPECIFICATIONS

In the Agreement Article 4.02-A, the time of substantial completion shall be 810 calendar days. The time for final completion shall be 840 calendar days.

In the Notice to Proceed, the time of substantial completion shall be 810 calendar days. The time for final completion shall be 840 calendar days.

Replace specification 11229 – Grit Dewatering with the attached version. *Engineer's note: language was added regarding a control panel.*

In specification section 11335, 2.01-A-1, a FalconRake as supplied by Lakeside is an accepted equal.

RECEIPT OF THIS ADDENDUM MUST BE ACKNOWLEDGED ON THE BID.

**SECTION 11229
GRIT DEWATERING**

PART 1 GENERAL

1.01 SCOPE

- A. Furnish and install one degritting system, consisting of one 12-inch minimum diameter screw type dewatering classifier each, complete with one 10-inch minimum diameter grit cyclone.
- B. The complete degritting system specified in this Section shall be furnished by, and be the product of, one manufacturer including the cyclone, classifier and all specified accessories and appurtenances, to ensure compatibility, integrity of individual components and unit responsibility.
- C. Classifiers shall settle grit particles from a pumped grit slurry of up to 2% solids. Classifiers shall dewater grit particles and convey them to a dumpster via a rotating screw.

1.02 SUBMITTALS

- A. Submittals shall be in accordance with all requirements of Sections 01300, 01410, and 11050 and shall include:
 - 1. Shop Drawings for Review:
 - a. General arrangement and scaled dimensional drawings.
 - b. Wiring schematics with termination point identification.
 - c. Materials of Construction.
 - d. Manufacturer's catalog data.
 - e. Motor information in accordance with Section 11050.
 - 2. Information for the Record:
 - a. Test reports and material certification for materials of construction.
 - b. Equipment acceptance test procedures.
 - 3. O&M Manuals.

1.03 QUALITY ASSURANCE

- A. All degritting equipment furnished under this Section shall be of a design and manufacturer that has been used in similar applications and it shall be demonstrated to the satisfaction of the Owner that the quality is equal to equipment made by that manufacturer specifically named herein. Manufacturers shall provide evidence of at least five installations in which identically sized equipment has provided satisfactory performance for a minimum of five years in a similar application.

1.04 PROJECT HANDLING

- A. Manufacturer recommendations shall be followed for delivery, storage, handling, and protection.

PART 2 PRODUCTS

2.01 CYCLONE

- A. Cyclone shall consist of a heavy-duty cast iron volute feed chamber with one cylindrical and two conical sections of fabricated steel and two apex sections of aluminum to minimize overhung weight.
 - 1. Each section of the cyclone shall be individually lined and protected from the high velocity grit by a replaceable rubber liner. The cyclone shall be so constructed so any section of the liner can be replaced independently.
 - 2. A hinge and quick disconnect clamp shall be provided between the apex assembly and lower cone section to allow removal of material which may clog the apex, without disconnecting any piping on the cyclone itself.
- B. The feed to the cyclone shall be 4 inches, the overflow 6 inches, with Victaulic or flanged connections furnished by the cyclone manufacturer.
- C. The cyclone shall be supplied complete with a 2-inch apex.
- D. The cyclone vortex finder shall be 4 inches diameter and made of an abrasion-resistant alloy with an approximate hardness of 500 Brinell.
- E. Each cyclone inlet shall be tapped for a 1-inch NPT gauge connection and a diaphragm-protected pressure gauge shall be provided by the cyclone manufacturer.
- F. The cyclone underflow shall feed into the classifier for washing and dewatering, and be sized so that the proper hydraulic loading is provided to the classifier.
- G. The cyclone overflow will feed to piping furnished by the contractor which must be properly and adequately vented to prevent siphoning.
- H. The cyclone manufacturer shall supply a stainless steel support to mount the supplied cyclone.
 - 1. The cyclone shall be attached to a 3/8-inch stainless steel mounting plate, designed such that the cyclone is properly oriented into the classifier feedboxes.
 - 2. The cyclone mounting plate shall be independently supported with two structural stainless steel supports, designed for attachment to the floor with anchor bolts.

2.02 CLASSIFIER

- A. Classifier shall consist of a full flared fabricated stainless steel grit settling tank with a screw type grit conveyor. All electrical devices shall be rated for Class I, Div. 1 Group D service.
 - 1. The classifier shall have a minimum pool area at maximum water level of 8.3 square feet, a minimum weir length of 28.3 inches, and a screw speed of 12 RPM maximum.

2. The grit settling tank shall be constructed of 1/4-inch thick 316 stainless steel plate, suitably reinforced and mounted on steel supports at a slope of not more than 3-1/2 inches per foot. The tank shall be designed to provide a settling compartment where grit separation takes place, with a minimum full water depth of 150 percent of the screw diameter.
 3. The weir overflow shall discharge into a launder box equipped with a 4-inch screwed pipe nozzle or Victaulic fitting for connection to drain.
 4. The classifier tank shall be provided with a 316 stainless welded bar, running from the top of the tank to below the water level to provide a sluice channel, in order to prevent the buildup of grit opposite the raked material, to aid in drainage. The manufacturer shall supply and install a valve cock with NPT nipple for the spiral sluice water. A 115 volt, single-phase solenoid valve, which is compatible with the motor enclosure, shall also be supplied and installed by the manufacturer for the sluice water line and connected by the electrical contractor to open when the grit classifier motor is activated. Solenoid valve must be rated for Class I, Division I, Group D service.
- B. The classifier tank shall be supplied complete with 316 stainless steel fabricated feed box, which shall be mounted to the tank periphery with seamless welding, to facilitate the introduction of underflow from the cyclone into the classifier.
1. Feed boxes shall be stainless steel plate, and shall be lined with 1/4-inch thick neoprene to protect against abrasion, and to function as a splashguard. Radial flow diffusers shall not be acceptable.
 2. The feed boxes shall have hinged covers, to provide for inspection of the cyclone apexes without disturbing the cyclone piping or alignment. The hinged covers shall be provided with two snap buckles, one on each, side for quick release.
 3. The feed boxes shall be designed and located by the manufacturer to minimize short-circuiting to the overflow weir of the classifier, and to handle maximum cyclone underflow discharge.
 4. The classifier manufacturer shall be responsible for ensuring that the feed boxes are designed to dissipate energy generated from the head drop of the cyclone underflow, to minimize disruption of the classifier pool.
 5. Each classifier must have a drain with ball valve connection.
- C. The grit shall be removed from the bottom of the settling compartment and discharged by means of a 50 percent pitch, 12-inch diameter screw-type conveyor.
1. The screw length shall be designed such that at minimum pool depth, a dry drainage deck having a minimum length of 43 inches exists between the points where the underside of the screw exits the pooling area to a point where the dewatered grit is discharged from the classifier tank.
 2. The screw shall be made from stainless steel flight sections welded to the shaft and fitted with replaceable wearing shoes.

- a. The pipe shaft of the conveyor shall be a minimum of 3-inch diameter, Sch. 40, 0.337 wall thickness pipe, and shall be designed with a maximum stress of 3,000 psi, and a fatigue at 98 percent reliability of 20 years minimum. Calculations, signed by a registered Professional Engineer, showing compliance with these requirements shall be submitted for approval.
 - b. The flights shall be stainless steel, with a minimum 12 gauge thickness and a minimum height of 4-1/8-inch when measured along the face of the flight.
- D. Wearing shoes shall be abrasion-resistant and mounted on the flights by means of bolts and nuts. The abrasion resistant wearing shoes shall be of minimum of 500 Brinell Ni-Hard material, and shall be a minimum of 10 gauge in thickness and have a 4 inch face width.
- E. For shafted screw conveyors, the screw conveyor shall be rigidly supported at both the upper and lower ends by special bearings, so that the screw conveyor is mounted above, and does not contact, classifier tank. This mounting shall provide for a clearance between the screw conveyor and the tank bottom, so that a buildup of sand or grit will provide a bed for the screw, eliminating tank wear, and providing a drainage area for the conveyed grit.
1. The upper end of the screw conveyor shall be connected to a cycloidal motion speed reducer by a flanged, rigid coupling. The cycloidal speed reducer shall be designed so that all torque is transmitted by rollers, and shall be capable of withstanding shock loads of 500 percent of rated loading.
 - a. The cyclodrive shall take radial and all thrust loads from the shaft, and at maximum load provide a minimum B-10 bearing life of 50,000 hours. Gear type speed reducers are not acceptable.
 - b. The cyclodrive shall be direct connected to a 1/2 HP totally enclosed motor.
 2. The lower end of the screw shall be supported by a submerged bearing, housed in a water-tight cast iron housing, suitable for completely submerged operation in grit service or an external bearing.
 - a. Submerged Bearing:
 - 1) The bearing shall be designed to accept radial loads from the spiral screw conveyor.
 - 2) The cast iron housing shall be provided with stainless steel cap screws fill and drain plugs.
 - 3) The bearing shall utilize a sealed bronze sleeve-type bearing, running completely submerged in oil, and shall require only yearly inspection and oil change.
 - 4) The bearing shall be provided with permanent stellite seals to prevent the leakage of oil and infiltration of grit and other foreign particles into the housing. The seal shall be of the self-compensating type, consisting of two mating hardened steel alloy rings, each held in place by a rubber toric. The wearing surfaces of the rings shall be precision lapped to form an initial sealing band of

approximately 1/32-inch in width. The seal shall be designed such that as seal rings wear through normal operation, the pressure from the rubber torics shall push the rings further against each other to form a broadened contact band.

- 5) Lower bearing designs incorporating conventional packing or requiring external flushing will not be acceptable.
- b. External Bearing:
- 1) Shall have an external flanged roller bearing and seal assembly.
 - 2) The roller bearing shall bear the weight, with it and the seal to be located outside the trough, offering visual advantages and readily accessible for easy replacement.
 - 3) One type E roller bearing flange unit, Durashield heavy-duty non split grease purge type seal with aluminum housing with 304 stainless steel seal plate.
 - 4) A lubricator shall be included with the bearing. Lubricator shall utilize copper tubing between the reservoir and the bearing.
- F. For shaftless screw conveyors, the screw shall ride on replaceable wear bars.
- G. The classifier shall be fitted with a gasketed spiral guard cover to enclose the entire settling tank during normal operation. The gasketed spiral guard cover shall be stainless steel.
1. The gasketed spiral guard cover shall be fitted with gasketed hatch openings, which provide access to the conveyor screw for inspection.
 2. The cover and access hatches shall be fitted with adhesive backed neoprene rubber gaskets.
 3. Mounting clamps, hinges and hardware shall be 316 stainless steel. There shall be a sufficient number of clamps provided for the gasketed spiral guard cover and hatches.
 4. The hand wheel screw extension shall be enclosed by a rubber expansion bellows, which allows adjustment of the screw without the need to disconnect the bellows.
 5. The upper end of the tank shall include a rubber expansion bellows enclosing the area between end of the gasketed spiral guard cover and the cyclodrive to allow the upper assembly to pivot.

2.03 PERFORMANCE REQUIREMENTS

- A. The classifier and cyclone operating parameters, i.e., cyclone feed rate, pressure and underflow and classifier pool area, weir length, screw speed, submergence, and slope, have been selected to avoid buildup of fine grit in the classifier tank, which will cause grit of the desired size to be lost. Changes in any of these parameters will not be acceptable unless a detailed submittal showing calculations and operating data provides evidence that any such change will not affect the ability of the system to perform as specified.

2.04 GRIT CONTROL PANEL

A. System Control Panel:

1. One control panel shall be furnished, completely pre-wired and tested.
2. The control panel shall adhere to the following specifications:
 - a. Enclosure Rating: NEMA 4X
 - b. Material: 304SS
 - c. Voltage: 480 Volt
 - d. Phase: 3 Phase
 - e. Frequency: 60 Hz
 - f. Load: TBD Amp
 - g. Stepdown transformer for 120 volts
 - h. Starters
3. The Control panel shall contain all timers, switches, indicator lights, and other components necessary to operate the following equipment:
 - a. One Grit Pump.
 - b. One Grit Dewatering Unit.
 - c. Screenings Conveyor.
 - d. Wash water solenoid valve
4. The control panel shall be supplied with applicable control relays and time delay relays with a minimum one extra normally closed and one extra normally opened contact is provided for each relay.
5. Remote monitoring and control of the control panel is required by the SCADA.
6. The panel door layout shall include the following items:
 - a. Front panel mounted combination main disconnect switch and circuit breaker.
 - b. Back lit, push-to-test Power On indicating light.
 - c. System three position HOA switch.
 - d. System Emergency Stop push button.
 - e. System Alarm Reset push button.
 - f. Grit Pump, screening conveyor, and dewatering unit running light.
 - g. Grit Pump, screening conveyor, and dewatering unit three position HOA switches.

- h. Grit Pump, screening conveyor, and dewatering unit fail indicating light.
- i. Grit Pump manual START push button.
- j. Grit Pump manual STOP push button.
- k. Grit Dewatering wash water ON/OFF switch.
- l. Grit Dewatering wash water valve OPEN indicating light.
- m. Grit Dewatering wash water valve three position HOA switch.

7. SEQUENCE OF OPERATION

- (ii) The system shall be controlled to provide automatic or manual operation, manual starting and stopping and system shut down when a fault is detected.
- (iii) Plant water shall be supplied and distributed to the Grit Dewatering unit.
- (iv) Screened raw wastewater shall be gravity fed into the Grit tank continuously.
- (v) Grit Tank:
 - 1. Grit shall be continuously or intermittently discharged from the grit tank via the Grit Pump..
- (vi) Grit Dewatering Unit and Screenings Conveyor:
 - 1. The Grit Dewatering Unit and Screenings Conveyor shall run whenever grit slurry is being pumped to the unit.
 - 2. While the grit dewatering unit is running, the wash water solenoid valve shall be opened for the grit rinse system.
 - 3. A motion sensor shall be installed on the side of the Grit Dewatering Unit and screening conveyor shall detect movement of either unit. Lack of motion shall indicate drive unit failure and/or overload. Lack of movement or overload shall interrupt signal from the motion sensor to the timer. If the motion sensor fails to reset the timer, the Grit Dewatering Unit and Screenings Conveyor shall stop and the failure light illuminate.
 - 4. After a Grit Pump Shut Down, the Grit Dewatering Unit and screening conveyor shall continue to operate for an adjustable amount of time to allow for the removal and dewatering of all grit accumulated in the classifier. The off delay timer shall be adjustable from 0 to 60 minutes with a typical delay off time of 15 minutes.
 - 5. The screenings conveyor shall also receive inputs to start and stop from the two screen control panels to run as required when the screens run. The screenings conveyor fault from either overload or the motion sensor shall be utilized by the PLC to stop the screens.

PART 3 EXECUTION

3.01 COORDINATION

- A. Follow manufacturer's standard recommendations.

3.02 PREPARATION

- A. Initial lubrication required for start-up and field test operation shall be furnished and applied in accordance with the manufacturer's recommendations.

3.03 ERECTIONS AND INSTALLATION

- A. The Contractor shall furnish a qualified representative of the manufacturer to perform inspection, start-up, and training services. The manufacturer's representative shall be experienced in the installation, start-up, operation, and maintenance of the equipment.

3.04 INSPECTION, STARTUP, AND TRAINING

- A. Minimum Service Requirements:
 - 1. Certify proper installation.
 - 2. One eight-hour day on site for start-up and testing.
 - 3. One eight-hour day on site for operator training.
- B. Initial startup and instruction of the Owner's personnel in equipment operation shall be provided by the equipment manufacturer or manufacturer's representative.

PART 4 SPECIAL PROVISIONS

4.01 OPERATING CONDITIONS

- B. Degritter and Cyclone Assembly:
 - 1. Number: 1
 - 2. Capacity: 250 gpm
 - 3. Maximum Pressure Differential: 5 psig (at design capacity)
 - 4. Motor: 1/2 Hp
- C. Manufacturer:
 - 1. Wemco as manufactured by Trillium Pumps USA, Inc., Fluidyne, Enviro-Care, Jim Myers & Sons, Inc., or approved equal.

END OF SECTION