

SECTION 11378

DECANT MECHANISM

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope

1. Furnish and install three (3) floating weir decant mechanisms with stainless supports and hardware in each of the proposed Aerobic Digester basins as indicated on the Drawings and specified herein

B. Additional Requirements Specified Elsewhere

1. Section 01340: Shop Drawings and Product Data
2. Section 01400: Quality Control
3. Section 01600: Materials and Equipment
4. Section 01730: Operating and Maintenance Data

C. Related Work Specified Elsewhere

1. Section 02615: Ductile Iron Pipe
2. Section 02641: Valves and Accessories
3. Section 02708: Pressure Pipelines and Appurtenances
4. Section 05501: Anchor Bolts and Drilled-In Anchors

1.2 QUALITY ASSURANCE

- ###### A. All equipment supplied by a single manufacturer or supplier fully experienced in furnishing equipment of the type and size required

B. Design Basis

1. Aqua-Aerobic Systems, Inc., Rockford, IL
2. Equivalent products of other manufacturers may be accepted subject to compliance with design, function, materials, and performance of the specified items

1.3 SUBMITTALS

A. In accordance with Section 01340

1. Sufficient data to verify compliance with specifications and to illustrate construction and assembly of the products

B. Shop Drawings

C. Materials Specifications

D. Performance Data

1. Complete system design calculations
2. Construction drawings
3. Material specifications
4. Other pertinent data

E. Certification of Compliance

1. Manufacturer's affidavit of compliance certifying
 - a. All equipment and material comply with these specifications
 - b. Equipment has been properly installed and is operating within specification tolerances
 - c. All tests have been performed with satisfactory results

F. Operating and Maintenance Manuals in accordance with Section 01730

1.4 JOB CONDITIONS

A. Provide removal of aerobic digester supernatant from each cell

B. Install in three (3) rectangular concrete basins as indicated on the Drawings. Each basin has the following inside dimensions

1. Length: 52'-0"
2. Width: 54'-9"
3. Basin floor elevations
 - a. At wall = 5399.31
 - b. At center of digester = 5397.27
4. Operating liquid depth
 - a. Minimum = 5.5' at wall
 - b. Maximum = 10.5' at wall

C. Decant operation shall be controlled by a manual buried valve located on the south side of the aerobic digester basins as shown on the Drawings

D. Elevation: 5400.00 feet above mean sea level (digester decant wall pipe invert elevation)

PART 2 - PRODUCTS

2.1 PERFORMANCE AND DESIGN REQUIREMENTS

A. Design Criteria

1. Provide three (3) decant mechanisms, one for each proposed cell of the aerobic digester
2. The decant mechanisms shall provide for an adjustable decant rate
 - a. Minimum decant rate: 100 gallons per minute

- b. Maximum decant rate: 300 gallons per minute
- 3. The circular floating weir of the decant mechanism shall withdraw fluid from below the liquid surface, regardless of the liquid depth
 - a. Minimum depth below liquid surface: 4"
 - b. Maximum depth below liquid surface: 6"
- 4. Decant liquid shall be drawn through an adjustable weir opening
 - a. Minimum opening height: 2"
 - b. Maximum opening height: 6"
- 5. Circular decant weir shall be capable of withdrawing liquid from the entire 360° circumference without obstruction

B. Floating Weir Assembly

- 1. Provide floating weir decant mechanisms with integral floatation unit and stainless steel weir assembly
- 2. Weir
 - a. Construct of 304 stainless steel
 - b. Circular in shape
 - c. Provide vortex control baffles permanently attached to the weir
- 3. Flotation
 - a. Provide modular flotation device constructed of fiberglass or 304 stainless steel filled with closed cell polyurethane foam having a minimum density of 2.0 pounds per cubic foot
 - b. Completely seal float to prevent contact between the foam and the external environment
 - c. Minimum reserve buoyancy for stability: 900 pounds
- 4. Discharge hose
 - a. Size to handle the specified decant flow rates
 - b. Minimum hose diameter: 6"
 - c. Provide sufficient length to permit vertical movement of the floating weir assembly
 - d. Hose material
 - 1) EPDM tube
 - 2) Tire chord braided
 - 3) Helix wire reinforcement
 - e. Provide stainless steel 90° elbow for attachment to the decant hose and flanged wall penetration pipe
- 5. Restrained mooring system
 - a. Furnish as part of the floating weir assembly
 - b. Mooring frame
 - 1) Construct of 304 stainless steel
 - 2) Designed to allow assembly to move up and down in conjunction with changing liquid levels
 - 3) Remain restrained to the vertical pylons through the entire range of motion
 - c. Vertical pylons
 - 1) Minimum number of pylons per decant mechanism: 4
 - 2) Minimum 4" diameter Schedule 40 stainless steel pipe

- 3) Integral base plate constructed of 304 stainless steel. Secure base plate to basin floor with 304 stainless steel adhesive anchors
 - a) Refer to Drawings for difference in elevation of floor slab at each pylon and floor slab slope
 - b) Provide leveling shims suitable for submerged service or fabricate baseplate to accommodate floor slope
- 4) Provide additional supports to secure upper portion of pylons to side walls as necessary

2.2 SPARE PARTS

- A. Provide spare parts recommended by manufacturer

PART 3 - EXECUTION

3.1 INSTALLATION

A. Inspection

1. Inspect materials and equipment for signs of damage, pitting, rust, decay or other deleterious effects of storage, transportation, handling, etc.
 - a. Replace or repair any materials or equipment showing such effects to the satisfaction of the Engineer and Owner
 - b. Replace damaged materials or equipment with identical new materials or equipment

B. Equipment Installation

1. Handle, install, connect, clean, condition, align and adjust products and equipment in strict accordance with manufacturer's instructions and in conformity with specification requirements
 - a. Maintain one complete set of manufacturer's installation instructions at the jobsite during installation and until installation is accepted by the Engineer and Owner
 - b. Perform all work in accordance with manufacturer's instructions
 - 1) Do not omit any preparatory step or installation procedure unless specifically modified or exempted by contract documents
 - 2) Should job conditions or specification requirements conflict with manufacturer's instructions, consult with Engineer prior to proceedings
 - c. Shimming between machined surfaces is not permitted
2. Refer to Drawings for requirements of anchoring vertical pylons to basin floor slab
 - a. Minimum thickness ($\frac{3}{4}$ ") grout leveling pad may be constructed under each base plate; however, vertical pylon length must be adjusted to set top of all pylons at the same elevation and plumb
 - b. Refer to Drawings for minimum anchor embedment length and anchor devices required
3. Provide lubricants as recommended by the manufacturer
4. Fill vertical pylons with concrete prior to startup or as otherwise recommended by manufacturer

C. Adjustment and Cleaning

1. Perform all required adjustments, tests, operational checks, cleaning and other startup activities required

3.2 FIELD TESTING AND INSPECTION

A. Notify Owner and Engineer in writing when installation is ready for inspection

B. Perform inspections in presence of Engineer

C. Inspect all piping, joints and supports for proper installation and conformance to plans

D. Level Inspection

1. Use leveling instrument to insure all equipment is level and plumb

E. Leakage Test

1. Fill weir, discharge hose and piping with water from top of weir to manual control valve and let stand for minimum 24 hours
2. Repair any visible leaks
3. Repeat test until there are no visible leaks

3.3 FIELD QUALITY CONTROL

A. Provide Manufacturer's Field Service

1. Minimum one trip to project site for one full working day
2. Qualifications of manufacturer's representative
 - a. Authorized representative of the manufacturer
 - b. Experienced in the application and installation of the subject work, materials and equipment
3. Services provided by representative
 - a. Provide guidance to Contractor regarding proper installation
 - b. Inspect installation of equipment furnished under this section
 - c. Inspect, check, adjust and test equipment installed, as required, and approve final installation
 - d. Provide guidance at initial startup
 - e. Revisit site as often as required to correct all problems and until equipment installation and operation are acceptable to Engineer and Owner
4. Manufacturer's representative to instruct Owner's personnel in the operation and maintenance of the equipment furnished. Minimum one-half day including classroom and field training. May be combined with startup services

B. Furnish three (3) copies of written report to Engineer certifying that

1. Equipment is properly installed and lubricated

2. Equipment is in accurate alignment and balance
3. Equipment is free from any undue stress imposed by connecting piping, anchor bolts, etc.
4. Equipment has operated satisfactorily under full load conditions and as specified through full operating range

END OF SECTION