

SECTION 44 42 23.02 – CLARIFIER EQUIPMENT

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Replace existing clarifier drive mechanisms as indicated and in compliance with Contract Documents.
- B. Contractor shall furnish and install two (2) drive units with base plate, stainless steel chain guard, drive chain tightener with self-centering idler sprocket, and non-metallic drive chain.

1.2 SUPPLIER

- A. The clarifier equipment specified in this section shall be as manufactured by Brentwood, Evoqua, or approved equal.
- B. Each supplier shall submit a list of at least five (5) installations meeting the requirements specified herein.

1.3 WARRANTY

- A. Equipment supplier shall provide warranty for a minimum period of one year from startup or 18 months from time of equipment shipment. The warranty shall cover all defects or failures of materials or workmanship which occur as the result of normal operation and service.

1.4 SUBMITTALS

- A. Submit detailed certified dimensional drawings and manufacturer's product data for materials and equipment, show complete information concerning materials of construction, fabrication, protective coating, installation and anchoring requirements, fasteners and other details. Submit structural design calculations of main equipment parts.
- B. All structural design calculations must be stamped by a registered P.E. engineer to certify that all selected member sizes conform to specified structural design criteria. Submit certified results of all start-up performance tests.

PART 2 - PRODUCTS

2.1 GENERAL DESIGN

- A. Materials:

1. All structural steel shall conform to the requirements of ASTM A36. Except where specifically indicated otherwise, all plates and structural members shall have a minimum thickness of 1/4". Steel pipe used for structural members shall conform to A.S.T.M. A53. All aluminum shall be type 5052, 6061, 6063, or 214 alloy unless noted.

B. Welding:

1. All shop welding shall be continuous seal and shall conform to the latest standards of the "Structural Welding Code, AWS D1.1 of the American Welding Society.

C. Surface Preparation/Priming:

1. All submerged steel shall be sandblasted to near-white grade to SSPC-SP10, unsubmerged steel shall be sandblasted to commercial grade to SSPC-SP6. All steel to be shop primed with one coat epoxy paint to 3-6 MDFT. The drive unit shall be shop painted with the supplier's standard paint system. NOTE: Shop shall grind all sharp sheared or cut edges or other projections to a radius as required to ensure satisfactory paint adherence.

2.2 DRIVE UNIT

A. Drive Mechanism:

1. Each collector mechanism shall be operated by its own drive unit.
2. The motor shall be rated at 1/2 hp and 1.15 Service Factor, totally enclosed, fan cooled, ball bearing, constant speed of ample power for starting and continuously operating the mechanism under normal operating conditions without overloading. The motor shall conform to NEMA or IEC standards and be suitable for operation on 460 volts, 3-phase, 60 Hertz.
3. The speed reducer shall be of the helical gear type, fully housed, running in oil, with anti-friction bearings throughout. The speed reducer shall be designed and manufactured to AGMA standards and sized based on calculated average sludge load, stated under Design Criteria of this Specification, and have a 1.50 Service Factor based on motor nameplate HP (kW) rating.
4. The motor shall be directly connected to the speed reducer. V-belt drives will not be acceptable.
5. The drive chain and sprockets located above the operating platform shall be covered with a removable metal guard of No. 16 gauge Type 316L stainless steel. Provide a 1/16-inch (1.6 mm) neoprene gasket around the full perimeter

of the guard.

B. Drive Sprocket and Torque Overload Protection:

1. The drive sprocket shall consist of a polymeric plate section mounted to a Type 316 stainless steel driving hub. The sprocket plate section shall be molded of polyurethane. The sprocket shall be not less than 9.26 inch pitch diameter and have 11 teeth.
2. The drive sprocket shall be provided with a shear pin device to provide for protection of the drive equipment in the event of excessive loading. Aluminum shear pins shall be provided to transmit torque from the driving hub to the sprocket shear plate.
3. The driver sprocket hub shall be provided with a trip lug that, upon torque overload, shall contact the actuator arm of the double throw limit switch which, in turn, shall shut-off the motor and energize the alarm circuit. The limit switch shall be a combination NEMA 4X / 7 enclosure and shall be provided with a stainless steel support bracket for positioning adjacent to the overload device. Electrical controls for alarms shall be furnished by the Electrical Contractor as detailed in Division 16.

C. Drive Base:

1. Each drive unit shall be supported by a stainless-steel drive base. The drive base shall be designed to support the complete drive unit including forces encountered at the design torque overload protection setting.

D. Drive Chain:

1. The collector drive chain shall be NH78 non-metallic, having 2.61-inch pitch links with an average weight of 1.4 lb./ft.
2. The chain shall have a published working load not less than 1750 lb., based upon strength and fatigue considerations.
3. Provide chain components with a combined wear and corrosion resistance equivalent to 40 percent glass reinforced nylon type 6/6 thermoplastic resin. The chain links shall be connected with 7/16-inch diameter stainless steel pins. The pins shall be constructed to prevent rotation.

E. Chain Tightener:

1. The drive chain arrangement shall include a chain tightener to take-up excessive slack in the drive chain. The tightener assembly shall include a

Type 316L stainless-steel slide base with self-centering polyurethane or cast nylon idler sprocket.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. Install items in accordance with accepted shop drawings, manufacturer's printed instructions and as indicated. The equipment shall be installed properly to provide a complete working system.

3.2 MANUALS

- A. The equipment supplier shall furnish an electronic copy of the operation and maintenance manual, which will be retained at the installation site to assist plant operators. The manual shall include the supplier's erection and assembly recommendations and a complete list of recommended spare parts.

3.3 FIELD SERVICE

- A. The equipment supplier shall provide the service of a qualified representative for one (1) trip with one (1) day on-site to perform field measurements as necessary.

3.4 FIELD TESTING

- A. After installation of equipment, test system clearance and operate each unit to demonstrate its ability to operate continuously without vibration, jamming, or overheating and to perform specified function. Operate each unit 20 complete revolutions.
- B. Inspect entire collector for any damage or malfunction.
- C. During tests, observe and record head, motor inputs, reducer housing temperature, noise and vibration. Promptly correct or replace all defects or defective equipment revealed by or noted during tests, at no additional cost to the Owner, and repeat tests until specified results and results acceptable to the Engineer are obtained. Contractor to provide all labor, equipment, and materials necessary for conducting tests.
- D. Make all adjustments necessary to place equipment in specified working order at time of above tests.
- E. Remove and replace equipment at no additional cost to the Owner with the equipment that will meet all requirements specified and indicated if unable to demonstrate to satisfaction of the Engineer that units will perform the service specified and indicated.

3.5 CONTRACT CLOSEOUT

2. Provide in accordance with Section 01 77 00.

END OF SECTION