

## SECTION 11327 - GRIT CLASSIFIERS

### City of San Diego, CWP Guidelines

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NTS: The capacity of each classifier shall be based on plant flow and quantity of grit expected and shall be compatible with the capacity of its corresponding cyclone(s) and grit pump(s).

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#### **PART 1 -- GENERAL**

##### 1.2 WORK OF THIS SECTION

- A. The WORK of this Section includes providing [ ] helical-screw type grit classifier[s] and appurtenances as part of a combined grit separation, and classification unit(s) including all structural frames, drive units, mounting brackets, piping transitions, controls, safety equipment, accessories, tools, and spare parts for a complete and operational system.
- B. The WORK also requires that one manufacturer be made responsible for furnishing the WORK of this Section and the WORK of Section 11326, but without altering or modifying the CONTRACTOR'S responsibilities under the CONTRACT DOCUMENTS.
- C. The WORK additionally requires that the one responsible manufacturer shall manufacture the principal elements and components including, as a minimum, the classifier and the cyclone.

##### 1.2 RELATED SECTIONS

- A. The WORK of the following Sections applies to the WORK of this Section. Other Sections of the Specifications, not referenced below, shall also apply to the extent required for proper performance of this WORK.
  - 1. Section 11000 Equipment General Provisions
  - 2. Section 11199 Horizontal Recessed Impeller Pump
  - 3. Section 11326 Grit Cyclones
  - [4. Section 11328 Dumpsters and Receptacles]

##### 1.3 SHOP DRAWINGS AND SAMPLES

- A. The following shall be submitted in compliance with Section 01300:
  - 1. Manufacturer's descriptive literature.
  - 2. Dimensional shop drawings.
  - 3. Mounting support details.
  - 4. Certified performance data, based on tests of similar equipment, showing moisture content versus rate of grit delivered.
  - 5. Information on at least one successfully performing installation of comparable size and complexity constructed in the recent past, including contact name, address, and telephone number.

##### 1.4 SERVICES OF MANUFACTURER

- A. **Inspection, Startup, and Field Adjustment:** An authorized representative of the manufacturer shall visit the site for not less than [ ] day to furnish the indicated services.
- B. **Instruction of OWNER'S Personnel:** The authorized service representative shall also instruct OWNER'S personnel in the operation and maintenance of the equipment including step-by-step troubleshooting procedures with necessary test equipment for not less than [ ] day.

1.5 QUALIFICATIONS

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NTS: In the paragraph below, define the terms "comparable size and complexity" for the equipment or system specified. Requiring experience of more than one successful project requires sound justification and prior written approval from the City Project Manager.

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- A. **Manufacturer:** Company specializing in grit classifiers with minimum one successfully performing installation of comparable size and complexity constructed in the recent past. Equipment of comparable size and complexity shall have the following characteristics: [ ].

**PART 2 -- PRODUCTS**

2.1 EQUIPMENT REQUIREMENTS

- A. **Classifier Design:** The classifier mechanism shall be of the helical screw type, designed to maintain necessary velocities to retain organic matter in suspension and remove the nonorganic material of a size retained on a 150-mesh screen. The classifier shall be capable of removing substantially all 150-mesh grit having a specific gravity of 2.65 or greater from the underflow of the cyclone(s). Flushing water at 60-80 psi shall be provided to the grit classifier by means of a 1/2-inch pipe terminating in a manual isolation valve and rotameter. The helical-screw type classifier shall incorporate in its design arrangement for removal and replacement of the screw for periodic maintenance. The screw shall be equipped with easily-replaceable hardened wearing surfaces. Each classifier shall have hydraulic capacity suitable for the underflow from [1] [2] cyclone[s].
- B. **Drive Unit:** The screw-drive unit shall be mounted on top of the screw trough. The unit shall consist of a totally-enclosed, ball-bearing, constant-speed heavy-duty motor with V-belt drive to a worm-gear type speed reducer with oil-tight housing. A belt guard shall be provided. The output shaft of the reducer shall be direct-connected to the upper end of the screw conveyor.
- C. **Materials:** The equipment shall be fabricated with the following materials and parts:
  - 1. Flared tank assembly - Steel, A151 1015 to 1020
  - 2. Lower bearing assembly - Cast iron
  - 3. Pivot beam and motor support - Steel
  - 4. Spiral screw assembly - 304 stainless steel
  - 5. Lifting device - Steel
  - 6. Separator support - Galvanized steel
  - 7. Spray assembly - Steel

- 8. Spiral guards - Expanded metal
- 9. Wearing shoes - Ni-hard, ASTM A532 Brinell hardness 550 minimum

## 2.2 EQUIPMENT FEATURES

- A. The settling tank shall be hot-dip galvanized as a complete unit after fabrication. Minimum pool area at maximum water level shall be [ ] square feet.
- B. The weir length shall be [ ] inches minimum.
- C. The screw shall operate at [10] rpm maximum.
- D. Each grit dewatering unit shall be V-belt driven by a [1] HP, energy efficient, heavy duty type motor conforming to Section 16040.
- E. Lower bearing shall be housed in a watertight enclosure suitable for completely submerged operation in grit service. The bearing shall utilize a sealed bronze sleeve type bearing, running completely submerged in oil, and shall require only yearly inspection and oil change. Internal parts of the bearing shall be sealed from outside contamination by the use of floating stellite seals. Bearings shall have an L-10 rating life of 50,000 hours while operating at maximum load.
- F. The screw assembly shall be provided with a manually operated lifting device attached to the lower bearing assembly and arranged so that the lower bearing can be raised above maximum water level.
- G. The grit shall be removed from the bottom of the settling compartment and discharged by means of a 50 percent pitch helical screw conveyor. The helix shall be made up from preformed heavy steel flight sections with a minimum thickness of 3/16 inch welded to the shaft, fitted with wearing shoes. The wearing shoes shall be of 5/8-inch minimum thickness, replaceable and shall be mounted on the flights by means of countersunk 316 stainless steel bolts and nuts.
- H. At the upper end of the helical screw a minimum 3/8-inch diameter connection shall be provided to ensure continuous flushing of one side of the unit. The connection shall be equipped with a shutoff valve.
- I. Classifier slope shall not exceed 3-1/2 inches per foot.
- J. An expanded metal guard shall be provided over the full length of the rotating screw.

## 2.3 NAMEPLATES, TOOLS, AND SPARE PARTS

- A. **Spare Parts:** The WORK includes the following spare parts. Spare parts shall be stored in boxes, and identified with the equipment number by means of stainless steel or plastic name tags attached to the box.
  - 1. One set of drive bearings
  - 2. One set of oil seals and gaskets
  - 3. One set of screw bearing assemblies
  - 4. One upper gasket
  - 5. One drive belt

6. One lock bushing
7. One set of wearing shoes with 316 SS bolts and nuts

#### 2.4 MANUFACTURERS

A. Products shall be of the following manufacture and type or model (or equal):

1. Envirex, Inc. (Rexnord Company), model [       ]
2. Wemco (Envirotech Corp.), model [       ]

### **PART 3 -- EXECUTION**

#### 3.1 GENERAL

A. Installation of the grit classifier equipment shall be in strict accordance with the requirements of the manufacturer's written instructions and shop drawings.

#### 3.2 FIELD TESTING

A. Upon completion of the installation, each piece of equipment and each system shall be tested for proper performance and satisfactory operation without excessive noise, vibration, and overheating. All equipment must be adjusted and checked for misalignment, clearances, supports, and adherence to safety standards by the equipment manufacturer for no less than [1] day. Equipment manufacturer shall certify proper installation prior to startup.

\*\* END OF SECTION \*\*