

SECTION 11305  
ODOR CONTROL SYSTEM

PART GENERAL

SECTION INCLUDES

Fiberglass reinforced plastic odor control system for sewage treatment plant clarifiers and sludge thickeners, and including:  
Odor hood (Launder covers).  
Ductwork.  
Exhauster.  
Scrubber.

RELATED SECTIONS

Section 11201 - Wash Troughs.  
Section 11202 - Effluent (Collection) Troughs (Launders).  
Section 11203 - Finger Weir Pans.  
Section 11204 - Weir Plates, Scum Baffles, and Brackets.  
Section 11205 - Density Current Baffle System.  
Section 11206 - Palmer-Bowlus Flumes.  
Section 11207 - Parshall Flumes.  
Section 11208 - Metering Manholes.  
Section 11225 - Clarifiers.  
Section 11286 - Slide Gates and Guides.  
Section 11380 - Sludge Digestion Equipment.  
Section 13122 - Pre-Engineered Fiberglass Buildings.  
Section 13230 - Digester Covers and Appurtenances.  
Section 13260 - Sludge Conditioning Systems.

## Section 13411 - Instrument Consoles.

### REFERENCES

AMCA 210 - Laboratory Methods of Testing Fans for Rating.

AMCA 300 - Reverberant Room Method for Sound Testing of Fans.

ASTM D 256 - Standard Test Methods for Determining the Pendulum Impact Resistance of Notched Specimens of Plastics.

ASTM D 570 - Standard Test Method for Water Absorption of Plastics.

ASTM D 638 - Standard Test Method for Tensile Properties of Plastics.

ASTM D 648 - Standard Test Method for Deflection Temperature of Plastics Under Flexural Load.

ASTM D 696 - Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics Between -30 degrees C and 30 degrees C.

ASTM D 790 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.

ASTM D 2583 - Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor.

### SYSTEM DESCRIPTION

Supply odor control system complete with odor control launder covers, ductwork, damper, exhauster, and scrubber.

The system shall be the responsibility of a single manufacturer.

Design Requirements:

Design to operate at \_\_\_\_ CFM at \_\_\_\_ feet per minute velocity so as to evacuate the air and gases beneath the cover down to the water line in the trough at least 12 times per hour throughout the entire system.

Mold the combination odor hood launder cover and scum baffle in one piece to form a confined region free from irregularities or air gaps.

The system shall be totally sealed.

Performance Requirements

Design, install, and calibrate to comply with the field test requirements specified in Part 3 of this section.

SUBMITTALS

Submit under provisions of Section 01300.

Product Data:

Complete details and specifications of the scrubber system.  
Certification of exhauster performance.  
Test results of balsa-core and fiberglass reinforced plastic laminate.

Shop Drawings:

Show critical dimensions, jointing and connections, fasteners and anchors.  
Materials of construction.  
Core material and flatness  
Size of ductwork, dampers, handles, fasteners, gasket profiles.  
Sizes, spacing, and locations of structural members, connections, attachments, openings, fasteners, and loads.  
Field measurements.

Samples:

8-inch square samples of fiberglass reinforced plastic laminate with core materials typical to odor hood.

Quality Control Submittals:

Certified test results of air flow and H<sub>2</sub>S gas control from at least one of the manufacturer's installations. Test results shall have been recorded through air/gas test ports located above the trough in each segment.  
The name, address, phone number and location of 3 installations with equipment similar to that specified and which has performed satisfactorily for at least 3 years. Include the name of the engineering firm, contractor, and plant manager.

Design Data:

Size and details of inlet duct and exhaust duct with damper.  
Location and details of velocity measurement ports, CFM and velocity in FPM, and size of exhauster in CFM necessary to evacuate the air and gases beneath the cover down to the water line in the trough 12 times per hour.

Certificates:

Drawings reviewed and certified for compliance with the plans and specifications.

Manufacturers' certificate of compliance with the plans and specifications.

Manufacturer's Instructions:

Manufacturers' complete step-by-step installation instructions.

Manufacturer's Field Reports:

Certification that the system has been inspected, tested, calibrated, and meets the air-flow design criteria of the specification.

Certified test results recorded at each air velocity and gas test port from each clarifier in the system.

Contract Close-out Submittals:

Operation and Maintenance Data.

PART PRODUCTS

MANUFACTURERS

Provide products manufactured by Warminster Fiberglass Company; P.O Box 188, Southampton PA 18966-0188; ASD. Tel. (215) 953-1260, Fax. (215) 357-7893.

B. Products from other manufacturers will be considered for substitution prior to receipt of bids. Requests for substitution after bids have been received will not be considered. Requests for substitution must include the following information in order to be considered:

1. Formal written request certifying that products to be substituted will match specified products in terms of structural properties, dimensions, physical appearance, quality level, and quantities, and that they will perform the same function in the same manner and will achieve the same end result.
2. Manufacturer's and supplier's material data sheets, specifications, and performance data.
3. A list of three or more projects in satisfactory service for not less than three years that use products identical to those being proposed for substitution. For each project, include name, address, and telephone number of the engineer, the contractor, and the plant manager.

## MATERIALS

Fiberglass reinforced polyester resin composite laminate shall exhibit the following minimum properties:

- Impact, Notched, Izod (ASTM D 256): 10 ft. lb. per/in.
- Heat Distortion Point (ASTM D 648): 175 degrees.
- Water Absorption (ASTM D 570): 0.2 percent 24 hours.
- Tensile Strength (ASTM D 638): 11,000 PSI.
- Thermal Expansion (ASTM D 696):  $10.5 \times 10^{-6}$  in/in/deg F.
- Flexural Strength (ASTM D 790): 18,000 PSI.
- Flexural Modulus (ASTM D 790):  $0.9 \times 10^6$ .
- Hardness Test, Barcol (ASTM D 2583): 40 minimum.

Perform hardness tests on the resin-rich surfaces of the test samples.

Prepare test coupons in accordance with the appropriate ASTM test method.

The manufacturer shall maintain a continuous quality control program and upon request shall furnish certified test results of the physical properties.

## COMPONENTS

Launder/Weir Cover with Scum Baffle:

The odor hood shall consist of many segments, each one being molded as a one-piece unit of composite construction consisting of gel-coat, polyester resin, balsa-core, steel tubing, and fiberglass reinforcement. Each segment shall be molded with a downward vertical flange at each end and radial to the centerline, shop drilled for assembly. Each joint shall be sealed with a 1/4 inch x 3-1/2 inch neoprene sponge gasket. Fabricate to form a totally sealed air-and-gas-tight system to ensure complete removal of air and gas at a rate of 12 air changes per hour at the specified velocity measured at each air/gas test port in the system.

There shall be no air gaps permitted.

Mold the scum baffle and top cover in one-piece on a curved mold to form and maintain the true circular shape of the clarifier and the scum skimmer diameter. The scum baffle shall be 1/4 inch thick, minimum.

No further adjustment shall be necessary at installation to maintain a true, molded-in circular shape throughout the entire circumference.

Separate scum baffles, if used, shall be bolted to or sealed and

gasketed between the top of the baffle where it intersects with the top cover.

Laminate thickness: Not less than 1/8 inch thick on both the exterior and the interior of the cover.

Interior core material: Not less than 1 inch thick balsa core molded-in the full width and length of each segment. Steel Tubing 1 inch x 1 inch x 1/8 inch shall be molded in radially between and at each end of the weir hatch openings, the full width of the walking surface, and 1 piece molded-in parallel to the weir hatch opening at each location.

Air velocity and gas measuring test ports: Molded-in at the trough centerline of each segment.

Slope top cover toward the scum baffle at assembly from 1/8 inch to 1/4 inch for complete drainage of water.

Mold top cover flat within 1/16 inch.

Anti-skid surface coating of angular silica particles applied to the walking surface of each segment.

There shall be 3 weir hatch covers in each segment.

Provide separate fiberglass circular wall angles and scum baffle brackets for supporting the odor hood and for flexibility and adjustability in setting the elevation and the skimmer diameter of the scum baffle.

#### Weir Hatch Covers:

Match-metal-die molded using sheet molding compound (SMC).

Vertical flange 9/16 inch high all around.

41-3/8 inch long by 7-5/8 inch wide by 3/16 inch thick.

Attach cover to odor hood with 2 type 304 stainless steel piano hinges 0.050 inch thick by 4 inch long by 2 inch (open).

Hand pull molded-in as an integral part of the cover, 5 inch long by 3-1/4 inch wide by 1-1/2 inch deep with solid stainless steel bar for lifting.

Seal perimeter with a continuous extruded neoprene rubber "P" gasket bonded to the vertical leg with a corrosion resistant adhesive.

#### Ductwork:

Size to remove 100 percent of the air and gas beneath the cover at the rate of 12 changes per hour, in a totally sealed system, at the specified velocity.

Provide one inlet duct and one air flow equalization splitter, air flow directional baffle beneath the cover.

Locate the inlet duct 180 degrees from the exhaust duct.

Provide one exhaust duct for removing 100 percent of the air and gas beneath the cover at a minimum rate of 12 changes

per hour.

Mount 1 fiberglass, round, manual, butterfly control outlet damper in the exhaust duct for calibration of the velocity of air to meet 12 changes per hour.

Exhauster:

Provide 1 fiberglass radial fume exhauster for removal of highly corrosive H<sub>2</sub>S gases.

Flanged inlet and outlet dimensions shall conform to standard PS 15-69 or ANSI 150.

Steel shaft shall have an FRP sleeve bonded to the wheel backplate and extending out through housing shaft hole.

Size fume exhauster to develop 12 air changes per hour in a totally sealed odor control system at the specified velocity.

Exhauster shall be certified to meet the ratings of tests performed in accordance with AMCA standards 210 and 300 and comply with the requirements of the AMCA certified ratings program.

Scrubber:

Provide pre-engineered model Series VBS odor control scrubber system with air flows compatible with the odor hoods, ductwork, and fume exhauster.

Design scrubber to neutralize H<sub>2</sub>S and other sewage odors at a rate of 12 air changes per hour in a totally sealed odor control system at the specified velocity.

Scrubber system shall be of the following type:

Wet neutralization.

Wet caustic.

Catalytic.

Carbon adsorption.

PART EXECUTION

EXAMINATION

Verify that project conditions are suitable for system installation.  
Correct any deficiencies before proceeding.

INSTALLATION

Install system in accordance with manufacturer's detailed instructions.

Check and seal leaks between the top cover and the scum baffle

when the two are separate pieces. Air gaps are unacceptable.

Tolerances:

The scum baffle diameter shall be set accurately to plus or minus 1/4 inch, and shall match precisely with the circularity of the scum skimmer mechanism.

## FIELD QUALITY CONTROL

Upon completion of installation, Contractor shall perform the testing, inspection, and calibration functions listed below.

Inspection:

Verify that the entire system is balanced to function at the designed air flow rate in CFM and FPM.

Check system for leakage.

Seal gaps, cracks, and leaks with a RTV silicone sealant.

No air gaps will be accepted.

Tests:

Test and record velocity of air flow at each test port.

The system shall operate at not less than 90 percent of the design air velocity at the inlet and each air velocity test port.

The system shall operate at not more than 15 percent above design at the exhaust duct.

At each gas test port, test and record H<sub>2</sub>S gas in PPM, 1 inch above water level in trough.

The test result shall show maximum gas removal every 5 minutes with no dead air spaces.

Calibrate the scrubber system until the H<sub>2</sub>S gas is neutralized in the exhaust air stream, at a minimum of 12 air changes per hour through a totally sealed system.

## CLEANING

Leave the project site clean and free of debris.

## DEMONSTRATION

Demonstrate system adjustment, operation, maintenance to the Owner.

END OF SECTION