SECTION 467321 - AEROBIC DIGESTER AERATION EQUIPMENT

Note that this section has only been edited for NYSOGS standardization and has not been technically edited. The design engineer shall make all technical edits specific to the project for this section.

This Section includes requirements for aerobic digesters used in stabilization processes for wastewater residuals.

1. GENERAL
	* + 1. SUMMARY
				1. Section Includes:

Piping.

Valves.

Piping specialties.

Air diffusers.

Electrical appurtenances.

Mixers.

Decanting weirs.

* + - * 1. Related Requirements:

List other Sections directly related to or affecting Work of this Section. Include Sections specifying information expected to be found in this Section as well as Sections required to describe complete system or assembly requirements.

Section 262419 - Motor-Control Centers: Motor-control centers for electrical appurtenances.

Section 262923 - Variable-Frequency Motor Controllers: Motor-control requirements for decanting weir.

Section 400506 - Couplings, Adapters, and Specials for Process Piping: Expansion joints.

Section 400519 - Ductile Iron Process Pipe: Gas and sludge piping.

Section 400524 - Steel Process Pipe: Steel piping as required by this Section.

Section 400561 - Gate Valves: Gate valves as required by this Section.

Section 400562 - Plug Valves: Plug valves as required by this Section.

Section 400565.16 - Globe Valves: Globe valves as required by this Section.

Section 400565.23 - Swing Check Valves: Check valves as required by this Section.

Section 400593 - Common Motor Requirements for Process Equipment: Motor requirements for electrical appurtenances.

Section 464121 - Jet Mixing Equipment: Mixers as required by this Section.

Section 464123 - Submersible Mixers: Mixers as required by this Section.

* + - 1. REFERENCE STANDARDS

List reference standards included within text of this Section, with designations, numbers, and complete document titles.

* + - * 1. American Welding Society:

AWS D1.1 - Structural Welding Code - Steel.

* + - * 1. ASME International:

ASME B16.5 - Pipe Flanges and Flanged Fittings: NPS 1/2 through NPS 24 Metric/Inch Standard.

* + - * 1. ASTM International:

ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60000 PSI Tensile Strength.

* + - * 1. FM Global:

Product Certification and Testing.

* + - * 1. Manufacturers Standardization Society of the Valve and Fittings Industry:

MSS SP-78 - Cast Iron Plug Valves, Flanged and Threaded Ends.

* + - * 1. UL:

UL - Listing and Classification Marks.

* + - 1. PREINSTALLATION MEETINGS
				1. Convene minimum [**one week**] <**\_\_\_\_\_\_\_\_**> [**weeks**] prior to commencing Work of this Section.
			2. SUBMITTALS

Only request submittals needed to verify compliance with Project requirements.

* + - * 1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
				2. Manufacturer’s installation instructions shall be provided along with product data.
				3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
				4. Product Data: Submit manufacturer information describing materials of construction, fabrication, and protective coatings.
				5. Shop Drawings: Indicate materials and equipment, including wiring and control diagrams, performance charts and curves, installation and anchoring requirements, fasteners, and other details.
				6. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

Include separate Paragraphs for additional certifications.

* + - * 1. Manufacturer Instructions:

Submit detailed instructions on installation requirements, including storage and handling procedures, anchoring, and layout.

Submit installation, selection, and hookup configuration, with pipe and accessory elevations.

Submit hanging and support requirements and recommendations.

* + - * 1. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.
				2. Manufacturer Reports: Certify that equipment has been installed according to manufacturer instructions.
				3. Qualifications Statements:

Coordinate following Subparagraphs with requirements specified in QUALIFICATIONS Article.

Submit qualifications for manufacturer and installer.

Submit manufacturer's approval of installer.

* + - 1. CLOSEOUT SUBMITTALS
				1. Project Record Documents: Record actual locations and final orientation of equipment and accessories.
			2. QUALITY ASSURANCE

Include this Article to specify compliance with overall reference standards affecting products and installation included in this Section.

In following Paragraph insert "State of New York Department of Transportation," "Municipality of \_\_\_\_\_\_\_\_ Department of Public Works," or other agency as appropriate.

* + - * 1. Perform Work according to <**\_\_\_\_\_\_\_\_**> standards.

Include following Paragraph only when cost of acquiring specified standards is justified.

* + - * 1. Maintain <**\_\_\_\_\_\_\_\_**> [**copy**] [**copies**] of each standard affecting Work of this Section on Site.
			1. QUALIFICATIONS

Coordinate following Paragraphs with requirements specified in SUBMITTALS Article.

* + - * 1. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum [**three**] <**\_\_\_\_\_\_\_\_**> years' [**documented**] experience.
				2. Installer: Company specializing in performing Work of this Section with minimum [**three**] <**\_\_\_\_\_\_\_\_**> years' [**documented**] experience [**and approved by manufacturer**].
			1. DELIVERY, STORAGE, AND HANDLING
				1. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
				2. Store materials according to manufacturer instructions.
				3. Protection:

Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.

Provide additional protection according to manufacturer instructions.

* + - 1. EXISTING CONDITIONS
				1. Field Measurements:

Verify field measurements prior to fabrication.

Indicate field measurements on Shop Drawings.

* + - 1. WARRANTY

This Article extends warranty period beyond one year. Extended warranties may increase construction costs and Owner enforcement responsibilities. Specify warranties with caution.

* + - * 1. Furnish [**five**] <**\_\_\_\_\_\_\_\_**>-year manufacturer's warranty for digester appurtenances.
1. PRODUCTS
	* + 1. PIPING
				1. Air:

As specified in Section [**400523 - Stainless Steel Process Pipe and Tubing**] [**400524 - Steel Process Pipe**] [**400531 - Thermoplastic Process Pipe**].

End Connections: Flanged, Class [**125**] <**\_\_\_\_\_\_\_\_**>.

Bolts and Nuts: Comply with ASTM A307, Grade B.

* + - * 1. Sludge:

As specified in Section 400519 - Ductile Iron Process Pipe.

Pipe 4 Inches and Smaller: Thickness Class 51.

Pipe 6 Inches through 24 Inches: Thickness Class 50.

Pipe 30 Inches and Larger: Thickness Class 51.

End Connections: Flanged, Class [**125**] <**\_\_\_\_\_\_\_\_**>.

Bolts and Nuts: Comply with ASTM A307, Grade B.

* + - * 1. All Other Piping:

General service piping as specified in Section 400524 - Steel Process Pipe.

Pipe Smaller than 4 Inches:

End Connections: Screwed.

Fittings: Malleable iron; ASME B16.3.

Pipe 4 Inches and Larger:

End Connections: Flanged, Class 150.

Fittings: Comply with ASME B16.5.

* + - 1. VALVES
				1. Angle: Comply with MSS SP-80.
				2. Check: As specified in Section 400565.23 - Swing Check Valves.
				3. Globe: As specified in Section 400565.16 - Globe Valves.
				4. Gate: As specified in Section 400561 - Gate Valves.

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

* + - * 1. Knife Gate:

[Manufacturers](http://www.specagent.com/LookUp/?ulid=12742&mf=04&src=wd):

DESIGNER TO PROVIDE TWO MANUFACTURERS AND APPROVED EQUIVALENT FOR ALL LISTED PRODUCTS.

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

In following Subparagraph insert "State of New York Department of Transportation," "Municipality of \_\_\_\_\_\_\_\_ Department of Public Works," or other agency as appropriate.

Furnish materials according to <**\_\_\_\_\_\_\_\_**> standards.

Insert descriptive Specifications below to identify Project requirements and to eliminate conflicts with products specified above.

Description:

[**Minimum**] Working Pressure: [**\_\_\_\_\_\_\_\_ psig at \_\_\_\_\_\_\_\_ deg. F**] [**As indicated on valve schedule**].

Maximum Fluid Temperature: [**\_\_\_\_\_\_\_\_ deg. F**] [**As indicated on valve schedule**].

Design: Double seated.

Opening: Full port.

End Connections: [**ASME B16.1, B16.5, and B16.42, flanged**] [**Bell and spigot**] [**Mechanical joint**] <**\_\_\_\_\_\_\_\_**>.

Gear Actuator: [**Handwheel**] <**\_\_\_\_\_\_\_\_**>.

Materials:

Sleeve: [**Buna-N**] [**Neoprene**] [**EPDM**] <**\_\_\_\_\_\_\_\_**>.

Body: [**Ductile iron**] [**Steel**] <**\_\_\_\_\_\_\_\_**>.

Gate: [**Type 316 stainless steel**] <**\_\_\_\_\_\_\_\_**>.

Lining: [**Elastomer suitable for process fluid**] <**\_\_\_\_\_\_\_\_**>.

Connecting Hardware: [**Type 316 stainless steel**] <**\_\_\_\_\_\_\_\_**>.

* + - * 1. Plug:

As specified in Section 400562 - Plug Valves.

Comply with MSS SP-78.

* + - 1. PIPING SPECIALTIES
				1. Expansion Joints: As specified in Section 400506 - Couplings, Adapters, and Specials for Process Piping.
			2. AIR DIFFUSERS
				1. Type: Fine-bubble flexible-membrane disc.
				2. [Manufacturers](http://www.specagent.com/LookUp/?ulid=12743&mf=04&src=wd):

DESIGNER TO PROVIDE TWO MANUFACTURERS AND APPROVED EQUIVALENT FOR ALL LISTED PRODUCTS.

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

In following Paragraph insert "State of New York Department of Transportation," "Municipality of \_\_\_\_\_\_\_\_ Department of Public Works," or other agency as appropriate.

* + - * 1. Furnish materials according to <**\_\_\_\_\_\_\_\_**> standards.

Insert descriptive Specifications below to identify Project requirements and to eliminate conflicts with products specified above.

* + - * 1. Description:

Openings: Reseal when air is turned off, in a manner such that liquid does not flow back into air lines.

Replaceable Module: Removable from air piping network to facilitate replacement of individual diffuser.

Materials:

Membrane: [**EPDM**] <**\_\_\_\_\_\_\_\_**>.

Diffuser Body and Retainer Ring: [**Glass-filled polypropylene**] <**\_\_\_\_\_\_\_\_**>.

End Connection: 3/4 inch NPT male inlet.

* + - * 1. Performance and Design Criteria:

Air Flow Rate [**from Each Diffuser**]:

Design: <**\_\_\_\_\_\_\_\_**> scfm

Peak: <**\_\_\_\_\_\_\_\_**> scfm

Maximum Head Loss: <**\_\_\_\_\_\_\_\_**> inches wc, based on <**\_\_\_\_\_\_\_\_**> feet submergence.

Integral check valve.

* + - 1. ELECTRICAL APPURTENANCES
				1. Motors: As specified in Section 400593 - Common Motor Requirements for Process Equipment.
				2. Motor Controls: As specified in [**Section 262923 - Variable-Frequency Motor Controllers**].
				3. Motor-Control Centers: As specified in Section 262419 - Motor-Control Centers.

Consider using following Article if additional mixing is required beyond that supplied by air diffusers.

* + - 1. MIXERS
				1. As specified in Section [**464121 - Jet Mixing Equipment**] [**464123 - Submersible Mixers**].

As an alternative to following Article, consider using multiple valved openings for decanting.

* + - 1. DECANTING WEIRS
				1. Description: Decant trough, weir, [**floating scum buffer,**] carrier pipes, rotary collection pipe, submersible support bearings, and drive mechanism.
				2. Operation:

Variable-Speed Drive:

Controls decanting flow rate.

As specified in Section 262923 - Variable-Frequency Motor Controllers.

Drive Limits: Adjustable for bottom water level, top (park), and high level safety.

* + - * 1. Material: [**Carbon steel**] [**Stainless steel**] <**\_\_\_\_\_\_\_\_**>.
1. EXECUTION
	* + 1. EXAMINATION
				1. Verify layout and orientation of equipment, accessories, and piping connections.
			2. INSTALLATION
				1. According to manufacturer instructions and as indicated on Drawings.

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

In following Paragraph insert "State of New York Department of Transportation," "Municipality of \_\_\_\_\_\_\_\_ Department of Public Works," or other agency as appropriate.

* + - * 1. Installation Standards: Install Work according to <**\_\_\_\_\_\_\_\_**> standards.
			1. FIELD QUALITY CONTROL
				1. Testing:

Test for proper operation.

Control System: Start by energizing system equipment and testing operation of hardware and process control logic under supervision of manufacturer's representative and in presence of [**Director’s Representative**] <**\_\_\_\_\_\_\_\_**>.

* + - * 1. Manufacturer Services: Furnish services of manufacturer's representative experienced in installation of products furnished under this Section for not less than <**\_\_\_\_\_\_\_\_**> days on Site for installation, inspection, startup, field testing, and instructing Director’s Representative in operation and maintenance of equipment.
				2. Equipment Acceptance:

Adjust, repair, modify, or replace components failing to perform as specified and rerun tests.

Make final adjustments to equipment under direction of manufacturer's representative.

* + - * 1. Furnish installation certificate from equipment manufacturer's representative attesting that equipment has been properly installed and is ready for startup and testing.
			1. DEMONSTRATION
				1. Demonstrate equipment startup, shutdown, routine maintenance, and emergency repair procedures to Director’s Representative

END OF SECTION 467321