SECTION 467133 - ROTARY DRUM THICKENING EQUIPMENT

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

This Section includes rotary drum thickeners used for thickening sludge in wastewater treatment facilities.

Rotary drum thickening equipment is generally preceded by a sludge conditioning step in which a flocculation aid is added to the sludge, which is then gently mixed in a flocculation tank to enhance dewatering. The rotary drum unit typically contains a sludge mixer or conveying screw, which delivers sludge treated with flocculation chemical to the internal surface of a wedgewire screen, a woven-wire screen, or a perforated drum. As the drum rotates, free water passes through the openings and solids are trapped on its surface. Solids are conveyed by the rotating drum to the discharge point, where the thickened sludge is discharged to a collection hopper or conveyor belt.

1. GENERAL
	* + 1. SUMMARY
				1. Section Includes: Rotary drum thickening equipment and accessories.
				2. 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 055000 - Metal Fabrications: Shop-fabricated metal fasteners and supports as required by this Section.

Section 262923 - Variable-Frequency Motor Controllers: Drive for flocculation tank mixer.

Section 460548 - Vibration and Seismic Controls for Water and Wastewater Equipment: Requirements for vibration and seismic control for equipment specified in this Section.

Section 460553 - Identification for Water and Wastewater Equipment: Nameplates for equipment specified in this Section.

Section 464111 - Rapid Mixers: Mixers as required for equipment specified in this Section.

Section 464117 - Inline Static Mixers: Mixers as required for equipment specified in this Section.

* + - 1. REFERENCE STANDARDS

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

* + - * 1. American Bearing Manufacturers Association:

ABMA 9 - Load Ratings and Fatigue Life for Ball Bearings.

ABMA 11 - Load Ratings and Fatigue Life for Roller Bearings.

* + - * 1. American Society of Mechanical Engineers:

ASME B16.1 - Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250.

* + - * 1. National Electrical Manufacturers Association:

NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).

NEMA ICS 2 - Controllers, Contactors and Overload Relays Rated 600 V.

* + - * 1. UL:

UL Listing Directory.

* + - 1. COORDINATION
				1. Coordinate Work of this Section with Work of other Sections.
			2. PREINSTALLATION MEETINGS
				1. Convene minimum [**one week**] <**\_\_\_\_\_\_\_\_**> [**weeks**] prior to commencing Work of this Section.
			3. 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's product data for system materials and component equipment, including electrical characteristics and connection requirements.
				5. Shop Drawings:

Indicate system materials and component equipment.

Submit wiring and control diagrams, installation and anchoring requirements, fasteners, and other details.

* + - * 1. 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.
				2. Source Quality-Control Submittals: Indicate results of [**shop**] [**factory**] tests and inspections.
				3. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.
				4. Manufacturer Reports: Certify that equipment has been installed according to manufacturer instructions.
				5. 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. Operation and Maintenance Data: Submit maintenance instructions for 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. Storage: 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.

Protect piping and equipment from entry of foreign materials by using temporary covers.

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 rotary drum thickening equipment.
1. PRODUCTS
	* + 1. PERFORMANCE AND DESIGN CRITERIA
				1. Minimum Flow Rate: <**\_\_\_\_\_\_\_\_**> gpm
				2. Average Daily Flow Rate: <**\_\_\_\_\_\_\_\_**> gpm
				3. Maximum Flow Rate: <**\_\_\_\_\_\_\_\_**> gpm
				4. Sludge Type: [**Waste activated**] [**Primary**] [**Secondary**] [**Digested**] <**\_\_\_\_\_\_\_\_**>.
				5. Solids Concentration:

Initial: [**0.3 to 4.0**] <**\_\_\_\_\_\_\_\_**> to <**\_\_\_\_\_\_\_\_**> percent.

Final: [**6.0 to 8.0**] <**\_\_\_\_\_\_\_\_**> to <**\_\_\_\_\_\_\_\_**> percent.

* + - 1. ROTARY DRUM THICKENING EQUIPMENT
				1. [Manufacturers](http://www.specagent.com/LookUp/?ulid=12112&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:

Filtering Media: [**Perforated drum**] [**Wedgewire drum**] [**Woven-wire screen modules supported by rotating drum**] [**Woven polyester filter fabric modules supported by rotating drum**].

Furnish [**integral mixing tank**] [**screw conveyor**].

Tapered Openings: Furnish media with smaller openings upstream and larger openings downstream, to provide increased flow as sludge progresses through drum.

* + - * 1. [**Opening**] [**Perforation**] Size:

Wedgewire: <**\_\_\_\_\_\_\_\_**> inch

Drum: <**\_\_\_\_\_\_\_\_**> inch

Woven Wire: <**\_\_\_\_\_\_\_\_**> percent open area.

Woven Polyester Fabric: <**\_\_\_\_\_\_\_\_**> inch

* + - * 1. Wetted Parts: Type [**304**] [**316**] stainless steel.
				2. Drive Mechanism:

Gear motor.

[**Belt**] [**Chain and sprocket**].

* + - * 1. Spray System:

Type: [**Internal**] [**and**] [**external**], adjustable.

Source: Filtered water.

* + - * 1. Piping Connection: [**Flanged, ASME B16.1**] [**Bolt-on adapter**] <**\_\_\_\_\_\_\_\_**>.
				2. Operation:

Electrical Characteristics:

[**<\_\_\_\_\_\_\_\_> hp**] <**\_\_\_\_\_\_\_\_**> [**RLA**].

Voltage: <**\_\_\_\_\_\_\_\_**> V, [**single**] [**three**] phase, 60 Hz.

Maximum [**Fuse Size**] [**Circuit Breaker Size**] [**Overcurrent Protection**]: <**\_\_\_\_\_\_\_\_**> A.

Minimum Circuit Ampacity: <**\_\_\_\_\_\_\_\_**>.

Minimum Power Factor: <**\_\_\_\_\_\_\_\_**> percent at rated load.

Motors:

Constant speed, [**totally enclosed**] [**totally enclosed, fan cooled].**

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

Variable speed, as specified in Section 262923 - Variable-Frequency Motor Controllers.

UL listed for Class I, Division I, Group D service.

Control Panel:

NEMA 250 Type [**1**] [**4**] <**\_\_\_\_\_\_\_\_**>.

Controls:

Comply with NEMA ICS 2.

Power-Failure Protection: Furnish automatic motor starter reset, and alarm contact.

Jamming Protection: Furnish automatic drive motor reversal with time delay, and alarm contact.

Disconnect Switch: Factory mounted [**in control panel**] [**on equipment**].

* + - * 1. Bearings:

Bearing life is percent failure at rated hours; for example, L-10 life at 50,000 hours means 10 percent of bearings may be expected to fail at 50,000 hours.

Rating Life: L-10 of [**100,000**] <**\_\_\_\_\_\_\_\_**> hours under continuous operation.

Materials: According to ABMA [**9**] [**11**].

* + - 1. LUBRICATION
				1. Lubricate moving parts and protect from flooding according to manufacturer instructions.
				2. [**Oil**] [**Grease**] lubrication.
				3. Furnish [**sight glass**] <**\_\_\_\_\_\_\_\_**> for determining oil level.
			2. ACCESSORIES
				1. Conditioning Tank:

Size: [**As indicated on Drawings**] <**\_\_\_\_\_\_\_\_**>.

Material: [**Type 304 stainless steel**] [**Type 316 stainless steel**] <**\_\_\_\_\_\_\_\_**>.

* + - * 1. Mixer: [**Inline static mixer as specified in Section 464117 - Inline Static Mixers**] [**Flash mixer as specified in Section 464111 - Rapid Mixers**].
				2. Material: [**Type 304 stainless steel**] [**Type 316 stainless steel**] <**\_\_\_\_\_\_\_\_**>.
				3. Overflow switch and alarm contact.
				4. Drum brush.
				5. Fasteners and Supports: As specified in Section 055000 - Metal Fabrications.
			1. SOURCE QUALITY CONTROL
				1. Provide shop inspection and testing of completed assembly.

Include one or both of following Paragraphs to require Director's inspection or witnessing of test at factory.

* + - * 1. Director’s Inspection:

Make completed assembly available for inspection at manufacturer's factory prior to packaging for shipment.

Notify Director’s Representative at least [**seven**] <**\_\_\_\_\_\_\_\_**> days before inspection is allowed.

* + - * 1. Director’s Witnessing:

Allow witnessing of factory inspections and test at manufacturer's test facility.

Notify Director’s Representative at least [**seven**] <**\_\_\_\_\_\_\_\_**> days before inspections and tests are scheduled.

Include following Paragraph if reliance on fabricator's approved quality-control program is sufficient for Project requirements.

* + - * 1. Certificate of Compliance:

If fabricator is approved by authorities having jurisdiction, submit certificate of compliance indicating Work performed at fabricator's facility conforms to Contract Documents.

Specified shop tests are not required for Work performed by approved fabricator.

1. EXECUTION
	* + 1. EXAMINATION
				1. Verify that items provided by other Sections of Work are ready to receive Work of this Section.
			2. INSTALLATION
				1. According to manufacturer instructions.

\*\*\*\*\*\* [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. 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 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 467133