SECTION 462333 - AERATED GRIT REMOVAL 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 aerated grit removal equipment. Optional discharge equipment, including airlift pump and screw conveyor, are included in this Section.

Airflow is generated by an external blower and is injected into the aerated grit chamber to create a rolling flow pattern in the wastewater. Grit settles at the bottom of the chamber and lighter organic material is maintained in suspension to be processed further downstream.

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

Aerated grit removal equipment.

Airlift pumps.

Screw conveyors.

* + - * 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 055000 - Metal Fabrications: Fasteners, brackets, and other miscellaneous metal fabrications as required by this Section.

Section 460548 - Vibration and Seismic Control for Water and Wastewater Equipment: Vibration isolation and seismic control of grit removal equipment and appurtenances.

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

Section 462366 - Grit Storage Containers: Configuration of containers to receive washed grit for offloading.

* + - 1. REFERENCE STANDARDS

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

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

ASME B17.1 - Keys and Keyseats.

ASME B17.2 - Woodruff Keys and Keyseats.

ASME B29.400 - Combination, "H"-Type Mill Chains, and Sprockets.

* + - * 1. American Water Works Association:

AWWA C504 - Rubber-Seated Butterfly Valves, 3 In. (75 mm) Through 72 In. (1,800 mm).

* + - 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's Product Data for system materials and component equipment, including electrical characteristics.
				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 equipment meets or exceeds specified requirements.

Include separate Paragraphs for additional certifications.

* + - * 1. Manufacturer's 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: Indicate that equipment has been installed according to manufacturer's instructions.
				5. Qualifications Statement:

Coordinate following Subparagraph with the requirements specified in QUALIFICATIONS Article.

Submit qualifications for manufacturer.

* + - 1. CLOSEOUT SUBMITTALS
				1. Project Record Documents: Record actual locations of installed aerated grit removal equipment.
				2. Operation and Maintenance Data: Submit instructions for equipment and accessories.
			2. MAINTENANCE MATERIAL SUBMITTALS
				1. Spare Parts:

Furnish [**one set**] [**two sets**] of manufacturer's recommended spare parts.

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

Furnish [**two**] <**\_\_\_\_\_\_\_\_**> of <**\_\_\_\_\_\_\_\_**>.

* + - * 1. Tools: Furnish special [**wrenches**] <**\_\_\_\_\_\_\_\_**> and other devices required for Director’s Representative to maintain equipment.
			1. 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 the Work of this Section on-Site.
			1. QUALIFICATIONS

Coordinate following Paragraph with the requirements specified in SUBMITTALS Article.

* + - * 1. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum [**three**] <**\_\_\_\_\_\_\_\_**> years' [**documented**] experience.
			1. DELIVERY, STORAGE, AND HANDLING
				1. Deliver materials in manufacturer's packaging including application instructions.
				2. Inspection: Accept materials on-Site in original packaging and inspect for damage.
				3. Store materials according to manufacturer's instructions.
			2. 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 Director’s Representative enforcement responsibilities. Specify warranties with caution.

* + - * 1. Furnish [**five**] [**10**] <**\_\_\_\_\_\_\_\_**>-year manufacturer's warranty for aerated grit removal equipment and accessories.
1. PRODUCTS
	* + 1. AERATED GRIT REMOVAL EQUIPMENT
				1. [Manufacturers](http://www.specagent.com/LookUp/?ulid=11701&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: Air piping and valves, swing diffuser holder assembly, header pipes, hoist, and diffusers.

Baffles:

Material: [**Steel plate**] [**Redwood**] <**\_\_\_\_\_\_\_\_**>.

Thickness: As indicated on Drawings.

Air Source:

[**Blowers B-<\_\_\_\_\_\_\_\_> and B-<\_\_\_\_\_\_\_\_>**] [**As indicated on Drawings**].

Maximum Flow Rate: <**\_\_\_\_\_\_\_\_**> scfm) at <**\_\_\_\_\_\_\_\_**> psig.

* + - * 1. Air Piping: [**Stainless-steel piping, as specified in Section 400523 - Stainless Steel Process Pipe and Tubing**] [**As indicated in piping schedule**].
				2. Diffusers:

Type: Nozzle.

Nozzle Orifice Size:

As recommended by aerated grit-removal-equipment manufacturer for application.

Ensure proper range of exit velocity and back pressure.

Material: [**Cast iron**] [**Stainless steel**] [**PVC**] <**\_\_\_\_\_\_\_\_**>.

Mounting: [**Stainless-steel fasteners**] [**Threaded on diffuser header**] <**\_\_\_\_\_\_\_\_**>.

* + - * 1. Diffuser Holder Assembly:

Description: Upper pivot joint with air-control and shutoff valve, drop pipe with intermediate pivot joint, and diffuser header.

Upper Pivot Joint:

Cast [**iron**] [**steel**].

Sleeve Bearings: Lubricated bronze.

O-Ring Gaskets: [**Chloroprene rubber**] [**Buna-N**] <**\_\_\_\_\_\_\_\_**>.

Valve:

Type: Butterfly.

Comply with AWWA C504.

Body: [**Cast iron**] [**Bronze**].

Seat: [**Chloroprene rubber**] <**\_\_\_\_\_\_\_\_**>.

Operation: [**Lever**] [**Handwheel**].

Furnish portable hoist to raise and lower diffuser assembly [**as indicated on Drawings**].

* + - 1. SCREW COLLECTOR
				1. Description: Screw assembly, motor drive, assembly, and appurtenances.
				2. Screw:

Diameter: <**\_\_\_\_\_\_\_\_**> inches.

Shaft:

Material: Cold-rolled steel.

Diameter: <**\_\_\_\_\_\_\_\_**> inches.

Pitch: [**Half**] <**\_\_\_\_\_\_\_\_**>.

Flights: Butt welded on Schedule 80 steel pipe.

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

Flights: Steel, with shafts of solid cold-rolled steel.

Keyways:

Provided keyways to attach driven sprockets.

Keys and Keyseats: Comply with ASME B17.1 or ASME B17.2.

* + - * 1. Driven Sprocket:

Material: Cast iron.

Construction: Split.

Nuts and Bolts: Cadmium plated.

Key seated on screw drive shaft.

* + - * 1. Tail-Shaft Bearings:

Grease lubricated.

Provide steel bushings.

* + - * 1. Drive-End Bearings:

Bearing life is percent failure at rated hours; e.g., L-10 life at 300,000 hours means 10 percent of bearings may be expected to fail at 300,000 hours.

Ball Bearings:

Comply with ABMA 9.

L-10 Life: [**40,000**] <**\_\_\_\_\_\_\_\_**> hours.

Roller Bearings:

Comply with ABMA 11.

L-10 Life: [**40,000**] <**\_\_\_\_\_\_\_\_**> hours.

* + - * 1. Chain:

ASME B29.400, combination Type C102.

Average Ultimate Strength: 36,000 lb .

Link Material: [**Stainless steel**] [**Corrosion-resistant malleable iron**] <**\_\_\_\_\_\_\_\_**>.

* + - * 1. Sprockets:

Material: [**Stainless steel**] [**Fabricated steel**] [**Cast iron**] <**\_\_\_\_\_\_\_\_**>.

Minimum Tensile Strength: 20,000 psi .

Driving Sprockets Connection: Keyed to head shaft, conforming to ASME [**B17.1**] [**B17.2**].

* + - * 1. Drive Assembly:

Description: Motor; speed reducer; drive sprocket on output shaft of speed reducer, drive chain from drive sprocket to driven sprocket, shear pin, and Occupational Safety and Health Administration-approved chain guard.

* + - * 1. Operation:

Electrical Characteristics: As specified in [ **Section 262923 - Variable-Frequency Motor Controllers,**] and following:

[**<\_\_\_\_\_\_\_\_> hp**] [**<\_\_\_\_\_\_\_\_> rated load amperes**].

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.

Control Panel:

Factory mounted.

NEMA 250 [**4**] [**4X**] <**\_\_\_\_\_\_\_\_**>.

Single-point power connection and grounding lug.

Controls: <**\_\_\_\_\_\_\_\_**>.

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

Operation: [**Automatic**] [**Batch**] [**Manual**].

* + - 1. SOURCE QUALITY CONTROL

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

* + - * 1. Director’s Inspection: Make completed aerated grit removal equipment available for inspection at manufacturer's factory prior to packaging for shipment. Notify Director’s Representative at least [**seven**] <**\_\_\_\_\_\_\_\_**> days before inspection is allowed.
				2. 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 when reliance on fabricator's approved quality-control program is sufficient for Project requirements.

* + - * 1. Certificate of Compliance: When 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 headworks installation is ready to receive aerated grit removal equipment.
			2. INSTALLATION
				1. Install aerated grit removal equipment according to manufacturer's instructions.
				2. Air Piping: [**Stainless-steel piping, as specified in Section 400523 - Stainless Steel Process Pipe and Tubing**].

\*\*\*\*\*\* [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. After installation, inspect and test for proper operation.
				2. Testing:

Air Diffusers:

Ensure that each diffuser has uniform distribution along entire header.

Uniformity Testing Device: Scale for measuring air flow rate to header system and pressure gages for measuring pressure at third point of header.

Submerge diffusers in tap water to depth of 1 foot.

Diffuse air through diffusers at rate of <**\_\_\_\_\_\_\_\_**> cfm for one minute.

Reduce air flow rate to <**\_\_\_\_\_\_\_\_**> cfm per diffuser, and note uniformity of diffusion.

Replace nozzles that demonstrate unsatisfactory distribution.

* + - * 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, field testing, and instructing Director’s Representative's personnel 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 equipment has been properly installed and is ready for startup and testing.
			1. ADJUSTING
				1. Check control functions and adjust as required.
			2. CLEANING
				1. Blow systems clear of free moisture and foreign matter.
			3. DEMONSTRATION
				1. Demonstrate equipment startup, shutdown, routine maintenance, and emergency repair procedures to Director’s Representative.

END OF SECTION 462333