SECTION 462423 - INLINE GRINDERS

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 specifies inline grinders for use in a wastewater-treatment plant. Inline grinders are installed in a pipeline using standard piping fittings, and may be used to reduce solids in wastewater or in wastewater sludge.

1. GENERAL
	* + 1. SUMMARY
				1. Section Includes: Inline grinders.
				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: Fasteners, brackets, and other miscellaneous metal fabrications as required by this Section.

Section 400593 - Common Motor Requirements for Process Equipment: Electric motors and their accessories normally supplied as part of equipment assemblies.

* + - 1. DEFINITIONS

Limit list of definitions to terms unique to this Section and not provided elsewhere.

* + - * 1. FRP: Fiberglass-reinforced plastic.
				2. Inline Grinder: A type of sewage grinder that uses hardened cutters to shred objects into smaller pieces, installed upstream of pumps and unit processes to protect equipment. An inline grinder is installed in a wastewater-treatment plant pipeline using standard pipe fittings.
				3. TEFC: Totally enclosed, fan cooled.
			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. ASTM International:

ASTM A48 - Standard Specification for Gray Iron Castings.

ASTM B108 - Standard Specification for Aluminum-Alloy Permanent Mold Castings.

ASTM F593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.

* + - * 1. National Electrical Manufacturers Association:

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

* + - 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, including installation instructions, accessories, capacities and pressure differentials, power, rotational speed, electrical characteristics, and connection requirements.
				5. Shop Drawings:

Furnish wiring and ladder diagrams.

Indicate size and configuration of assembly, mountings, weights, and accessory connections.

* + - * 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 of grinders.
			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 Director’s REPRESENTATIVE ENFORCEMENT responsibilities. Specify warranties with caution.

* + - * 1. Furnish [**five**] <**\_\_\_\_\_\_\_\_**>-year manufacturer's warranty for inline grinders.
1. PRODUCTS
	* + 1. INLINE GRINDERS
				1. [Manufacturers](http://www.specagent.com/LookUp/?ulid=9611&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.

* + - * 1. Performance and Design Criteria:

Minimum Flow Rate: <**\_\_\_\_\_\_\_\_**> gpm.

Average Daily Flow Rate: <**\_\_\_\_\_\_\_\_**> gpm.

Maximum Flow Rate: <**\_\_\_\_\_\_\_\_**> gpm.

Maximum Working Pressure: <**\_\_\_\_\_\_\_\_**> psig.

Head Loss: <**\_\_\_\_\_\_\_\_**> inches of water at maximum flow rate.

* + - * 1. Housing: [**Ductile iron**] <**\_\_\_\_\_\_\_\_**>.
				2. Cutting Elements:

Material: [**Hardened steel**] [**Stainless steel**] <**\_\_\_\_\_\_\_\_**>.

Size: <**\_\_\_\_\_\_\_\_**> inch.

Configuration: Adjustable and removable.

* + - * 1. Bearings:

Type: [**Ball**] [**Roller**].

Comply with ABMA [**9**] [**11**].

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

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

Lubrication:

[**Oil**] [**Grease**].

Consider including following Subparagraph if oil lubrication is selected.

Provide sight glass for determining oil level.

* + - * 1. 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:

As specified in Section 400593 - Common Motor Requirements for Process Equipment.

Constant speed, [**totally enclosed**] [**TEFC**] [**explosion-proof, fan cooled**] [**explosion-proof, non-ventilated**] [**immersible**] <**\_\_\_\_\_\_\_\_**>.

Control Panel:

Factory mounted.

Enclosure: [**FRP**] [**Sheet steel**] <**\_\_\_\_\_\_\_\_**>.

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

Single-point power connection and grounding lug.

Controls:

Furnish audible and visual alarm for power failure and jamming.

Power Failure Protection: Automatic motor-starter reset.

Jamming Protection: Automatic drive motor reversal with time delay.

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

Operation Sequences: <**\_\_\_\_\_\_\_\_**>.

* + - * 1. Hydraulic [**Actuators**] [**Drives**]:

Mounting: Connected to grinder shaft.

Power Unit: Provide pressurized hydraulic fluid through oil reservoir, motor-driven positive-displacement pump, and control valves as required.

Pump Motor:

Type: Vertical; constant speed.

Rating: [**Totally enclosed**] [**TEFC**] [**Explosion proof**].

Connection: Rubber-covered, abrasion-resistant pressure hose with connectors.

* + - * 1. Accessories:

Fasteners and Supports: As specified in Section 055000 - Metal Fabrications.

Anchor Bolts and Nuts:

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

Comply with ASTM F593.

Motor Shaft Extension: [**6**] <**\_\_\_\_\_\_\_\_**>-inch increments.

Scraper: Steel.

* + - 1. SOURCE QUALITY CONTROL
				1. Provide shop inspection and testing of completed assembly.

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

* + - * 1. Director’s Inspection:

Make completed grinders 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 tests 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 manufacturer's approved quality-control program is sufficient for Project requirements.

* + - * 1. Certificate of Compliance:

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

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

1. EXECUTION
	* + 1. EXAMINATION
				1. Verify that designated areas, clearances, structural requirements, piping, utility connections, and electronic signals are ready to receive equipment.
			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. Inspection:

Ensure that grinder has been installed correctly and that there is no objectionable heat or vibration.

Ensure that bearings are adequately lubricated.

* + - * 1. Test for proper alignment.
				2. Manufacturer Services: Furnish services of manufacturer's representative experienced in installation of products furnished under this Section for not less than <**\_\_\_\_\_\_\_\_**> [**days**] [**hours**] on Site for installation, inspection, startup, field testing, and instructing Director’s Representative in operation and maintenance of equipment.
				3. 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, alarm condition responses, and emergency repair procedures to Director’s Representative.

END OF SECTION 462423