SECTION 407556 - SUSPENDED SOLIDS/SLUDGE DENSITY ANALYZERS

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 continuous and portable devices for measurement of suspended solids and sludge density in a wastewater treatment plant.

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

Continuous and portable suspended solids [**analyzers**] [**and**] [**sensors**].

Sludge density sensors.

* + - * 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 460553 - Identification for Water and Wastewater Equipment: Nameplates.

* + - 1. DEFINITIONS

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

* + - * 1. Suspended Solids (SS): Small solid particles in suspension in water.
			1. REFERENCE STANDARDS

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

* + - * 1. National Electrical Manufacturers Association:

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

* + - 1. 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 for system materials and component equipment, including electrical characteristics and connection requirements.
				5. Shop Drawings:

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

Indicate system materials, component equipment, wiring diagrams, and schematics.

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

Coordinate following Subparagraph with requirements specified in QUALIFICATIONS Article.

Submit qualifications for manufacturer.

* + - 1. CLOSEOUT SUBMITTALS
				1. Project Record Documents: Record actual locations of [**analyzers**] [**and**] [**sensors**].
			2. MAINTENANCE MATERIAL SUBMITTALS
				1. Spare Parts:

Furnish [**one**] <**\_\_\_\_\_\_\_\_**> complete [**assembly**] [**assemblies**] for each specified [**analyzer**] [**and**] [**sensor**].

* + - 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 Work of this Section on Site.
			1. QUALIFICATIONS

Coordinate following Paragraph with 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. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
				2. Store products according to manufacturer instructions.
				3. Protection:

Protect products 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 State enforcement responsibilities. Specify warranties with caution.

* + - * 1. Furnish [**five**] <**\_\_\_\_\_\_\_\_**>-year manufacturer's warranty for [**analyzers**] [**and**] [**sensors**].
1. PRODUCTS
	* + 1. SUSPENDED SOLIDS/SLUDGE DENSITY ANALYZERS AND SENSORS
				1. [Manufacturers](http://www.specagent.com/LookUp/?ulid=12480&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. Portable Analyzers:

Type: Optical.

Range: [**10 to 10,000**] [**<\_\_\_\_\_\_\_\_> to <\_\_\_\_\_\_\_\_>**] mg/L.

Accuracy: Plus or minus [**5 percent of reading**] [**100 mg/L**].

Repeatability: Plus or minus [**1 percent of reading**] [**20 mg/L**].

Housing:

Waterproof.

Material: [**Polyurethane**] <**\_\_\_\_\_\_\_\_**>.

Display: LCD.

Calibration: Field.

Cleaning: Air or water jet.

* + - * 1. Continuous Analyzers:

Range: Zero to [**10,000**] [**50,000**] <**\_\_\_\_\_\_\_\_**> mg/L.

Outputs:

[**4 to 20 mA**] [**Zero to 1 V dc**].

[**RS-485**] [**and**] [**Modbus**].

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

Profibus.

Channels: [**Single**] [**Dual**].

Setpoint Relays: [**Two**] <**\_\_\_\_\_\_\_\_**> per channel.

Display:

LCD.

Size: [**2 by 1-1/2**] [**<\_\_\_\_\_\_\_\_> by <\_\_\_\_\_\_\_\_>**] inches

Backlit.

Enclosure:

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

Material: [**Fiberglass**] <**\_\_\_\_\_\_\_\_**>.

Furnish [**polystyrene**] <**\_\_\_\_\_\_\_\_**> junction box and quick disconnect.

Mounting: Rear rail.

Calibration: Field.

Cleaning: Air or water jet.

Accessories:

Surge protection.

[**Heater.**]

* + - * 1. Low-Range Sensors:

Type: Optical.

Range: [**10 to 1,500**] [**<\_\_\_\_\_\_\_\_> to <\_\_\_\_\_\_\_\_>**] mg/L.

Accuracy: Plus or minus [**5 percent of reading**] [**5 mg/L**].

Repeatability: Plus or minus [**1 percent of reading**] [**2 mg/L**].

Enclosure:

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

Material: [**Polyurethane**] <**\_\_\_\_\_\_\_\_**>.

Furnish junction box and quick disconnect.

Cable:

Size: [**22**] <**\_\_\_\_\_\_\_\_**> AWG

Length: [**25**] [**50**] <**\_\_\_\_\_\_\_\_**> feet

Cleaning: Air or water jet.

* + - * 1. Submersible MLSS Sensors:

Type: Optical.

Range: [**300 to 3,000**] [**300 to 3,000**] [**<\_\_\_\_\_\_\_\_> to <\_\_\_\_\_\_\_\_>**] mg/L.

Accuracy: Plus or minus [**5 percent of reading**] [**100 mg/L**].

Repeatability: Plus or minus [**1 percent of reading**] [**10 mg/L**].

Enclosure:

Material: [**Polyurethane**] [**PVC**] <**\_\_\_\_\_\_\_\_**>.

Furnish quick disconnect to monitor.

Cable:

Size: [**22**] <**\_\_\_\_\_\_\_\_**> AWG

Length: [**25**] [**50**] <**\_\_\_\_\_\_\_\_**> feet

Cleaning: Air or water jet.

* + - * 1. Submersible MLSS Sensors:

Type: Optical.

Range: [**300 to 3,000**] [**300 to 3,000**] [**<\_\_\_\_\_\_\_\_> to <\_\_\_\_\_\_\_\_>**] mg/L.

Accuracy: Plus or minus [**5 percent of reading**] [**100 mg/L**].

Repeatability: Plus or minus [**1 percent of reading**] [**10 mg/L**].

Cable:

Size: [**22**] <**\_\_\_\_\_\_\_\_**> AWG

Length: [**25**] [**50**] <**\_\_\_\_\_\_\_\_**> feet

Cleaning: Air or water jet.

Enclosure:

Material: [**Polyurethane**] [**PVC**] <**\_\_\_\_\_\_\_\_**>.

Furnish quick disconnect to monitor.

High-density sensors are for use in waste activated sludge (WAS) and return activated sludge (RAS) piping.

* + - * 1. High-Density Sensors:

Type: Optical.

Range: [**300 to 3,000**] [**300 to 30,000**] [**800 to 8,000**] [**800 to 80,000**] [**<\_\_\_\_\_\_\_\_> to <\_\_\_\_\_\_\_\_>**] mg/L.

Accuracy: Plus or minus [**5 percent of reading**] [**<\_\_\_\_\_\_\_\_> mg/L**].

Repeatability: Plus or minus [**1 percent of reading**] [**<\_\_\_\_\_\_\_\_> mg/L**].

Cleaning:

Air or water jet.

Furnish compression fitting.

Mounting: [**2**] <**\_\_\_\_\_\_\_\_**>-inch male insertion nipple.

Enclosure:

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

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

* + - * 1. Operation:

Electrical Characteristics:

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

Voltage: <**\_\_\_\_\_\_\_\_**> [**V ac**] [**V dc**] [**, 60 Hz**].

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

1. EXECUTION
	* + 1. EXAMINATION
				1. Verify that designated areas, clearances, 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. Test and calibrate analyzer to demonstrate that it meets specified accuracy requirements.
				2. Equipment Acceptance:

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

* + - 1. DEMONSTRATION
				1. Demonstrate equipment operation, routine maintenance, alarm condition responses, and emergency repair procedures to Director’s Representative.

END OF SECTION 407556