SECTION 465111 - FIXED MECHANICAL AERATORS

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 mechanical aerators permanently attached within a tank or basin. Floating mechanical aerators are specified in Section 465113.

Surface aerators use propeller blades submerged or partially submerged in the sewage; the drive motor is mounted on a platform for access. Aerators generate an upflow or a downflow diffusion pattern in the sewage, which is controlled by a draft tube appropriately located within the tank.

1. GENERAL
   * + 1. SUMMARY
          1. Section Includes: Fixed mechanical aerators.
          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: Miscellaneous metalwork and fasteners as required by this Section.

Section 400593 - Common Motor Requirements for Process Equipment: Electric motors and 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. Oxygenation Capacity: The mass of oxygen that can be dissolved in a specific volume of water during one hour by using the aerator being investigated, determined at standard atmospheric pressure, a water temperature of 20 degrees C, and an initial dissolved oxygen content of zero.
        2. Oxygenation Capacity Efficiency: The oxygenation capacity per aerator nameplate power.
      1. REFERENCE STANDARDS

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

LEED requires compliance with specific editions of referenced standards. Consider including publication dates for referenced standards in this Section to ensure that the correct standard is used for LEED compliance.

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

ASCE 2 - Measurement of Oxygen Transfer in Clean Water.

* + - * 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 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.
        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.
      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. Deliver materials in manufacturer's packaging; include application instructions.
         2. Inspection: Accept aerators on Site in manufacturer's original packaging and inspect for damage.
         3. Store aerators according to manufacturer instructions.
         4. 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 fixed mechanical aerators.

1. PRODUCTS
   * + 1. FIXED MECHANICAL SURFACE AERATORS
          1. [Manufacturers:](http://www.specagent.com/LookUp/?ulid=12938&mf=04&src=wd)

DESIGNER TO PROVIDE TWO MANUFACTURER’S 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. Description: Aerator assembly consisting of motor, gearbox, draft tube, aerator skirt, and supporting parts.
        2. Performance and Design Criteria:

Comply with ASCE 2.

Oxygenation Capacity: <**\_\_\_\_\_\_\_\_**> lb./h

Oxygenation Capacity Efficiency: <**\_\_\_\_\_\_\_\_**> lb./h per hp

Speed: [**50**] <**\_\_\_\_\_\_\_\_**> rpm.

Impeller:

Configuration: Open [**arcuate**] [**curved**] <**\_\_\_\_\_\_\_\_**>.

Non-clogging.

Blade Immersion: <**\_\_\_\_\_\_\_\_**> inches

Draft Tube:

Length: [**Full**] [**Short**] [**As indicated in schedule following END OF SECTION**].

Mounting: As indicated on Drawings.

Process Liquid:

Material: [**Mixed liquor sewage**] <**\_\_\_\_\_\_\_\_**>.

Temperature Range: <**\_\_\_\_\_\_\_\_**> to <**\_\_\_\_\_\_\_\_**> deg. F

* + - * 1. Materials: [**Carbon steel**] [**Stainless steel**] [**Polypropylene**] [**PTFE**] [**Polyvinylidene fluoride**] <**\_\_\_\_\_\_\_\_**>.
        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.

Control Panel:

Factory mounted.

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

Single-point power connection and grounding lug.

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

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

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

* + - 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 aerator 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 layout, type, and orientation of 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. 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's personnel 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. ATTACHMENTS

When relying on separate schedules, tables, illustrations, or forms to specify product requirements, include list of each attachment. Include identical list of attachments in Project Manual table of contents.

Consider including schedule if Project includes more than one aerator or more than one type of aerator.

Insert attachments following END OF SECTION. Consider following example when developing Project schedule.

* + - * 1. Fixed Mechanical Aerator Schedule:

FMA-1:

Blade Immersion: <**\_\_\_\_\_\_\_\_**> inches

Oxygenation Capacity: <**\_\_\_\_\_\_\_\_**> lb./h

Speed: <**\_\_\_\_\_\_\_\_**> rpm.

Draft Tube Length: <**\_\_\_\_\_\_\_\_**>.

Process Fluid: <**\_\_\_\_\_\_\_\_**>.

Material of Construction: <**\_\_\_\_\_\_\_\_**>.

Rated Power: <**\_\_\_\_\_\_\_\_**> hp

FMA-2:

Blade Immersion: <**\_\_\_\_\_\_\_\_**> inches

Oxygenation Capacity: <**\_\_\_\_\_\_\_\_**> lb./h

Speed: <**\_\_\_\_\_\_\_\_**> rpm.

Draft Tube Length: <**\_\_\_\_\_\_\_\_**>.

Process Fluid: <**\_\_\_\_\_\_\_\_**>.

Material of Construction: <**\_\_\_\_\_\_\_\_**>.

Rated Power: <**\_\_\_\_\_\_\_\_**> hp

END OF SECTION 465111