

SECTION 46 41 26: FLOATING MECHANICAL AERATORS/MIXERS

PART 1 - GENERAL

1.01 SUMMARY:

- A. This Section covers furnishing, installing, and testing of replacement aeration equipment for the existing Flow Equalization Basins. Including six (6) electric motor-driven air assist propeller-type, or rotor-type, floating aerator/mixers. In the case of air assist propeller-type aerators, each shall be equipped with a regenerative blower and blower motor. All aerator/mixers shall be equipped with flotation assemblies, electrical cables, and related hardware.
- B. Floating mechanical aerator/mixers shall be capable of mixing raw sewage. Aerator/mixers shall be certified for use in a Class 1, Division 2 location.
- C. Equipment shall be furnished complete with all components, hardware, motors, controls, and all other parts and accessories indicated, specified, or required for proper installation, operation, and maintenance.
- D. All Equipment specified in this section shall be provided by the same manufacturer and shall be suitable for installation and operation in the Flow Equalization Basins as indicated. Any revisions necessary for proper installation, operation and performance of the Equipment furnished shall be the responsibility of the Manufacturer.

1.02 REFERENCES:

- A. Applicable Standards:
 - 1. Anti-Friction Bearing Manufacturer's Association (AFBMA).
 - 2. American Gear Manufacturers Association (AGMA).
 - 3. American Iron and Steel Institute (AISI).
 - 4. American Society of Mechanical Engineers (ASME).
 - 5. American Society for Testing and Materials (ASTM):
 - a. A36 - Structural Steel.
 - b. A303/304 - Stainless Steel Bolts.
 - 6. American Welding Society (AWS).
 - 7. National Electrical Manufacturers Association (NEMA).
 - 8. National Electric Code (NEC).
 - 9. Occupational Safety and Health Administration (OSHA).

1.03 SUBMITTALS:

- A. Submit as specified herein:
- B. Definitions:
 - 1. Shop Drawings, product data, and Samples are technical Submittals prepared by the Contractor, Subcontractor, manufacturer, or Supplier and submitted by Contractor to Engineer as a basis for approval of the use of Equipment and Materials proposed for incorporation in the Work or needed to describe installation, operation, maintenance, or technical properties, as specified in each Division of the Specifications.
 - a. Shop Drawings include custom-prepared data of all types including drawings, diagrams, performance curves, material schedules, templates, instructions, and similar information not in standard printed form applicable to other projects.
 - 2. Informational Submittals are those technical reports, administrative Submittals, certificates, and guarantees not defined as Shop Drawings, product data, or Samples.
 - a. Technical reports include laboratory reports, tests, technical procedures, technical

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- records, and Contractor's design analysis.
- b. Certificates and guarantees are those Submittals on Equipment and Materials where a written certificate or guarantee from the manufacturer or Supplier is called for in the Specifications.
- C. Quality Requirements:
1. Submittals such as Shop Drawings and product data shall be of suitable quality for legibility and reproduction purposes. Every line, character, and letter shall be clearly legible. Drawings such as reproducibles shall be useable for further reproduction to yield legible hard copy.
 2. Documents submitted to Engineer that do not conform to specified requirements shall be subject to rejection by Engineer, and upon request by Engineer, Supplier shall resubmit conforming documents. If conforming Submittals cannot be obtained, such documents shall be retraced, redrawn, or photographically restored as may be necessary to meet such requirements. Supplier's failure to initially satisfy the legibility quality requirements will not relieve Supplier from meeting the required schedule for Submittals.
- D. Language and Dimensions:
1. All words and dimensional units shall be in the English language.
 2. Metric dimensional unit equivalents may be stated in addition to the English units. However, English units of measurement shall prevail.
- E. Submittal Completeness:
1. Submittals shall be complete with respect to dimensions, design criteria, materials of construction, and other information specified to enable Engineer to review the information effectively.
 2. Where standard drawings are furnished which cover a number of variations of the general class of Equipment, each drawing shall be annotated to indicate exactly which parts of the drawing apply to the Equipment being furnished. Use hatch marks to indicate variations that do not apply to the Submittal. The use of "highlighting markers" will not be an acceptable means of annotating Submittals. Annotation shall also include proper identification of the Submittal permanently attached to the drawing.
- F. Form of Submittals:
1. Submittals and other Project documents shall be transmitted as electronic (PDF) format.
- G. Includes, but not limited to, the following:
1. Manufacturer's specifications including brake horsepower, power input and design operating conditions.
 2. Detailed equipment and installation drawings including all weights and dimensions.
 3. Warranty.
 4. Power and Control schematic diagrams indicating factory and field wiring. All diagrams shall be complete and have uniquely numbered terminals, wires, and devices.
 5. Operation and maintenance manual.
 - a. Instructions for installation, start-up, operation, inspection, maintenance, parts lists and recommended spare parts, and data sheets showing model numbers.
 - b. Applicable drawings.
 - c. Warranties and guarantees.
 - d. Address of nearest manufacturer-authorized service facility.
 - e. All additional data specified.
 6. Protective coating system.
 7. Test results per Part 1.04
- H. Engineer's Review:
1. Engineer will review Submittals for indications of Work or Material deficiencies.
 2. Engineer will respond to Supplier on those Submittals which indicate Work or Material

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deficiency.

3. Engineer will provide an action stamp for every Submittal submitted with an action to be provided by the Supplier according to the following:

A - SUBMITTAL APPROVED: Signifies Equipment or Material represented by the Submittal conforms with the design concept and complies with the intent of the Contract Documents and is approved for incorporation in the Work. Contractor is to proceed with fabrication or procurement of the items and with related Work. Copies of the Submittal are to be transmitted to Engineer for final distribution.

B - SUBMITTAL APPROVED AS NOTED (RESUBMIT): Signifies Equipment and Material represented by the Submittal conforms with the design concept and complies with the intent of the Contract Documents and is approved for incorporation in the Work in accordance with Engineer's notations. Contractor is to proceed with fabrication or procurement of the items and with related Work in accordance with Engineer's notations and is to submit a revised Submittal responsive to notations marked on the returned Submittal or written in the letter of transmittal.

C - SUBMITTAL RETURNED FOR REVISION (RESUBMIT): Signifies Equipment and Material represented by the Submittal appears to conform with the design concept and comply with the intent of the Contract Documents but information is either insufficient in detail or contains discrepancies which prevent Engineer from completing his review. Contractor is to resubmit revised information responsive to Engineer's annotations on the returned Submittal or written in the letter of transmittal. Fabrication or procurement of items represented by the Submittal and related Work is not to proceed until the Submittal is approved.

D - SUBMITTAL NOT APPROVED (SUBMIT ANEW): Signifies Equipment and Material represented by the Submittal does not conform with the design concept or comply with the intent of the Contract Documents and is disapproved for use in the Work. Contractor is to provide Submittals responsive to the Contract Documents.

E - PRELIMINARY SUBMITTAL: Signifies Submittals of such preliminary nature that a determination of conformance with the design concept or compliance with the intent of the Contract Documents must be deferred until additional information is furnished. Contractor is to submit such additional information to permit layout and related activities to proceed.

F - FOR REFERENCE, NO APPROVAL REQUIRED: Signifies Submittals which are for supplementary information only; pamphlets, general information sheets, catalog cuts, standard sheets, bulletins and similar data, all of which are useful to Engineer or Owner in design, operation, or maintenance, but which by their nature do not constitute a

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basis for determining that items represented thereby conform with the design concept or comply with the intent of the Contract Documents. Engineer reviews such Submittals for general content but not for basic details.

G - DISTRIBUTION COPY (PREVIOUSLY APPROVED): Signifies Submittals which have been previously approved and are being distributed to Contractor, Owner, Resident Project Representative, and others for coordination and construction purposes.

1.04 QUALITY ASSURANCE:

A. Factory Tests and Reports:

1. General:

- a. Manufacturer shall submit factory tests, procedures, and standard operating procedures. Factory tests and procedures shall be reviewable and modifiable by the Engineer.
- b. Acceptable performance of the aeration equipment shall be demonstrated prior to shipment of equipment from the factory.
- c. Equipment shall be modified as required prior to shipment to meet specified performance criteria.
- d. Equipment manufacturer shall furnish all test equipment necessary to conduct the specified performance tests.
- e. One unmodified aerator/mixer shall be tested. Test may be witnessed by Owner or Engineer.

2. Oxygen Transfer Test Procedure:

- a. Oxygen transfer test procedure shall be in accordance with ASCE "Measurement of Oxygen Transfer in Clean Water", latest edition.
- b. Submit proposed test procedure including test tank and test equipment configuration to Engineer for approval prior to performing test.
- c. Aeration equipment performance shall be considered acceptable if the Standard Oxygen Transfer Rate (SOTR) of the tested aerator/mixer is measured to be greater than or equal to 2.5 pounds of oxygen transferred per horsepower per hour with the aerator/mixer drawing a minimum total power of 20 bhp.

1.05 FACTORY ASSEMBLY:

- A. Aerator/mixer units shall be completely shop assembled and aligned prior to shipping or testing.
- B. After completion of the specified factory tests, aerator/mixers shall be prepared for shipment with the minimum amount of disassembly, and such that no field disassembly, cleaning, or flushing is required.
- C. Any components removed for shipping shall be match-marked prior to removal and shipment.

1.06 DELIVERY, STORAGE AND HANDLING:

- A. Manufacturer shall ship equipment pre-assembled to the degree that is practicable.
- B. Tag each item of equipment with contract number and equipment number.
- C. Protect all piping, equipment, conduit and control panel open-end connections with suitable end protection.
- D. Protect bearings and couplings against damage.
- E. Provide written rigging instructions for handling.
- F. Manufacturer shall provide instructions indicating specific requirements to protect against damage to or deterioration of components during delivery, storage, and handling.

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1.07 WARRANTY:

- A. The aerator/mixer manufacturer shall supply a 1-year non-prorated factory warranty to start upon the Owner's final acceptance of all units in operation.
- B. All parts supplied by the aerator/mixer manufacturer must be warranted by the same.
- C. Field replacement of aerator/mixer components shall in no way effect the manufacturer's warranty.
- D. All warranty repairs must be done in accordance with the manufacturer's O&M Manual.
- E. Manufacturer shall repair or replace any components that fail in materials or workmanship within the specified warranty period.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURER:

- A. Aeration Industries International, Inc.
- B. DBS Manufacturing.
- C. Or equal.

2.02 GENERAL REQUIREMENTS:

- A. Furnish six (6) electric motor-driven air assist propeller-type, or rotor-type, floating aerator/mixers for the indicated basins. The aerator induces the flow of air below the surface of the water and provides flow-linkage mixing in multiple unit arrangements.
- B. The aerator/mixers shall include an electric motor and, if applicable, a regenerative blower, both located above the water surface. The motor is connected to a hollow shaft within a protective housing positioned at desired angles for water displacement downward into the water. The hollow shaft drives a propeller(s), or rotor, beneath the water surface.
- C. Field replacement of aerator/mixer components shall in no way affect warranty.
- D. Include with the aerator/mixers the following:
 - 1. All items necessary for complete assembly and installation.
 - 2. All appurtenances and safety devices required for proper operation and maintenance.
 - 3. All manuals, drawings, parts lists, and special tools required for assembly, maintenance, and operation.
 - 4. Lubricants required for start-up procedure specified and one year of continuous operation.
 - 5. Aeration units shall be delivered completely assembled or in convenient sections as permitted by common carrier.
- E. All fasteners and hardware shall be stainless steel.
- F. This Section specifies equipment components to be supplied such as aerator/mixers, drive motors, blowers, and accessories. The specifying of these items in no way relieves the Equipment Supplier from being responsible for meeting all requirements of this section.

2.03 OPERATING CONDITIONS:

- A. Aerator/mixers shall be suitable for transferring oxygen and completely mixing the Flow Equalization Basins with aerator/mixers installed in the positions indicated.
- B. Flow Equalization Basin is divided into three sections with volumes and dimensions listed below and operating depths of 0 to 14 feet:
 - 1. Cell A volume is 6 MG with dimensions 250' by 250'.
 - 2. Cell B volume is 4 MG with dimensions 250' by 160'.
 - 3. Cell C volume is 2 MG with dimensions 250' by 82'.
- C. Aerator/mixers shall be installed in Cells A & B shown in contract Drawing.

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- D. Flow Equalization Basins have a concrete bottom and sides as shown in contract Drawing.
- E. The Flow Equalization Basins receives screened and primary clarified raw wastewater.
- F. Design parameters used for the design of the aeration system include the following:
 - 1. Aeration Basin Liquid Temperature:
 - a. Minimum: 10° C.
 - b. Maximum: 25° C.
 - 2. Maximum total horsepower per aerator/mixer: 20 hp.
 - 3. Minimum oxygen transfer provided per aerator/mixer: 50 lb/hr O₂.

2.04 DESIGN REQUIREMENTS:

- A. Each aerator/mixer shall be capable of providing the specified minimum SOTR.
- B. Drive motor and blower motor sizes shall be the same for all six (6) aerator/mixers. If aerators include blowers, the combined operating brake horsepower of the drive motor and blower motor shall not exceed 20 hp for any one aerator.
- C. The aeration equipment shall be designed to limit the longitudinal thrust on the mooring cables to no more than 1,000 pounds for any single aerator/mixer when operated singly or in combination with any number of additional aerator/mixers.

2.05 AERATOR DRIVE MOTORS:

- A. Rated for 900 rpm, 480-volt, 3-phase, 60 Hz operation.
- B. Motor enclosure shall be Totally Enclosed, Fan Cooled (TEFC).
- C. Motor frame shall be made of cast iron end brackets and cast-iron body and shall have "C" face mounting provisions.
- D. Motor configuration shall allow mounting with vertical shaft where bearings provide sufficient support.
- E. Conforming to NEMA Design B, Class F insulation.
- F. Horsepower Rating Requirements:
 - 1. Ambient Temperature Range: 0 °C to 45°C.
 - 2. Service Factor: 1.15.
 - 3. Speed as specified or indicated for each piece of equipment driven.
 - 4. Adequate to drive equipment without using service factor except in emergency conditions.
 - 5. Rated for continuous duty.
- G. Interior and exterior of the motor shall be painted. The exterior shall be painted with a rust resistant primer and a rust resistant paint. The interior shall be painted with a rust resistant primer, or a rust resistant primer and paint. The exterior coating of paint shall provide suitable UV protection so that color retention and surface does not deteriorate within 10 years of normal outdoor exposure.
- H. Provision for draining the motor shall be located on the shaft end of the motor. Provision shall be made to allow internal moisture to drain thru the outer edge of the motor C-face. All other drain holes are to be plugged in a watertight manner.
- I. Inpro type seals shall be installed external to the motor on the shaft end of the motor to prevent moisture from entering the motor along the shaft.
- J. The motor shall be balanced to within 1 MIL to be measured on any part of the motor frame, including the C-face.
- K. The noise level of the motor shall be in accordance with NEMA MG 1-12.49.
- L. Minimum L10 bearing life for continuous operation of 100,000 hours to conform to AFBMA.
- M. Provide three "Klixon" type thermal switch detectors (one per phase) imbedded in the stator windings. Provide N.O. contacts and wire out to a separate conduit box on the motor.
- N. Motor space heaters shall be provided on all motors securely attached to the motor windings.

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Motor space heaters shall be designed to maintain the motor internal temperature above the dew point when the motor is not running. Space heaters shall be silicon rubber type designed for long life and low skin temperature. Motor space heaters shall be operated at 120Vac.

- O. A stainless-steel nameplate shall be provided with each motor and shall be securely fastened thereto. Information shall include voltage, speed, phase, insulation class, amperage, service factor, wiring diagram and motor serial number.
- P. The conduit box shall be a two-piece cast iron box firmly bolted to the motor housing frame at four points. There shall be a neoprene type gasket between the conduit box cover and box to inhibit water entry into the enclosure. The wire patch between the conduit box and motor shall have a gasket or adequate sealing material to inhibit moisture from entering the motor or conduit box. The cover is to be attached to the conduit box with four 410 or better stainless-steel screws.
- Q. A wiring diagram on a stainless-steel plate showing proper power connection, lead designation, and lead configuration shall be affixed to the motor. Acceptable locations are the name plate and/or the inside surface of the conduit box cover.
- R. Wire leads shall be legibly marked with designations that match the wiring diagram. Lead designations shall not be written over other wire markings. Wire leads shall be non-wicking.
- S. The conduit box is to be installed so that the opening is on the same side as the motor shaft.

2.06 BLOWERS (IF APPLICABLE):

- A. Blowers shall be completely sealed regenerative type.
- B. Blowers shall be aluminum alloy construction and be complete with all necessary accessories including inlet filters, mounting hardware, and connecting fittings.
- C. Blower Motors:
 - 1. Rated for 480-volt, 3-phase, 60 Hz operation.
 - 2. Motor enclosure shall be Totally Enclosed, Fan Cooled (TEFC).
 - 3. Conforming to NEMA Design B, Class F insulation.
 - 4. Horsepower Rating Requirements:
 - a. Ambient Temperature: 0°C to 45°C.
 - b. Service Factor: 1.15.
 - c. Speed as specified or indicated for each piece of equipment driven.
 - d. Adequate to drive equipment without using service factor except in emergency conditions.
 - e. Rated for continuous duty.
 - 5. Motors shall have aluminum frames.
 - 6. Provide three "Klixon" type thermal switch detectors (one per phase) imbedded in the stator windings. Provide N.O. contacts and wire out to a separate conduit box on the motor.
 - 7. Motor space heaters shall be provided on all motors securely attached to the motor windings. Motor space heaters shall be designed to maintain the motor internal temperature above the dew point when the motor is not running. Space heaters silicon rubber type designed for long life and skin temperature. Motor space heaters shall be operated at 120Vac.

- 2.07 MOUNTING FLANGES: The mounting flanges shall be 304 stainless steel with machine registered fit and shall permit removal of the aerator mechanism leaving the motor in place. The mounting flange will allow the aerator to be rotated out of the water for inspection, maintenance, or storage.

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2.08 SHAFTS/UNIVERSAL JOINT COUPLINGS:

- A. The shafts shall be 304 stainless steel full welded to a forged carbon steel universal joint coupling. The shafts must be hollow to promote maximum air flow and oxygen transfer. The shafts shall be dynamically balanced.
- B. The universal joint couplings shall include a standard grease fitting for maintenance lubrication.
- C. The shafts shall be stabilized by a replaceable water lubricated bearing located within one inch from the propeller hub. The area of the shaft supported by the bearing shall be fitted with a replaceable hardened non-metallic sleeve.

2.09 HOUSINGS: The housings shall be 304 stainless steel and flanged for mounting to the aerators. The housings shall form a guard around the hollow shaft and support a field replaceable, water-lubricated bearing press-fitted into the housing lower end. Water lubrication holes shall penetrate the housings in the area surrounding the bearing.

2.10 BEARINGS: The field replaceable water lubricated lower support bearings shall be constructed of post-cured elastomer molded inside a fiber backing. The bearings shall be press-fitted into the housing to allow ease of replacement.

2.11 SLEEVES: The replaceable hardened zirconia sleeves shall be the only moving part in contact with the elastomeric bearings and shall spin with the shaft as one unit. The sleeves shall be solid and homogeneous. Units must be supplied with replaceable hardened non-metallic sleeves.

2.12 PROPELLERS (IF APPLICABLE):

- A. The propellers shall be stainless steel specifically designed to maximize oxygen transfer and mixing characteristics. Propellers shall be self-tightening such that the propeller threads tighten on the shaft threads during normal operation. The entire flow of air shall pass through the propellers via the hollow drive shaft along the axis of the propeller hub.
- B. The propeller design shall be tested in clean water and shown to draw a minimum of 85% of the recommended full motor amperage load at nameplate voltage and power factor.
- C. The propeller shall be designed to allow easy removal and replacement in the field.

2.13 ROTORS (IF APPLICABLE):

- A. The rotors shall be stainless steel for submergence applications specifically designed to maximize oxygen transfer and mixing characteristics.
- B. The rotor design shall be tested in clean water and shown to draw a minimum of 85% of the recommended full motor amperage load at nameplate voltage and power factor.
- C. The rotor shall be designed to allow easy removal and replacement in the field.

2.14 VORTEX SHIELDS:

- A. A vortex shield shall be furnished with each mounting assembly to eliminate the formation of vortices, maximize shaft airflow and prevent cavitation damage to the propeller during operation at all water depths.
- B. Mount using stainless steel hardware.

2.15 LOCATION, SUPPORT AND MOORING:

- A. Aerator/mixers shall be located in the Aeration Basin as indicated.
- B. Mooring hardware shall be stainless steel. Anchors and mooring cables shall be provided by Owner.

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- 2.16 FLOTATION: The aerator/mixer flotation assemblies shall consist of pontoons constructed of molded low-density polyethylene with ultraviolet inhibitor, filled with urethane foam. Each pontoon shall have a buoyancy greater than 600 pounds. The pontoon shape shall be designed with smooth, beveled edges to allow freezing into ice without breakage. The pontoons shall be connected by stainless steel structural members.
- 2.17 ELECTRICAL SERVICE CABLES:
- A. Cables shall be CSA/UL approved for severe environments, suitable for underwater service and one continuous length from each motor to its respective junction box as indicated.
 - B. The cable shall be jacketed, flexible stranded cable with individually wrapped conductors rated SEO-WA or equal.
 - C. Adequate strain release and/or anchoring shall be provided for the cables at their respective motors to prevent undue cable stress, flexing, or abrasion during installation, operation, or maintenance.
 - D. Provide power cables for all floating mechanical aerator/mixers of 75-foot length.
- 2.18 SERVICING:
- A. Aerator/mixer mounting assemblies shall be designed so the aerator/mixer may be rotated completely out of the water to allow servicing without removing the aerator/mixer from the flotation assembly.
 - B. Aluminum or stainless-steel platforms shall be provided along both sides of the aerator/mixers, drive motors and blowers to facilitate personnel access to the equipment for maintenance.
- 2.19 PROTECTIVE COATINGS:
- A. All steel or cast-iron surfaces shall be completely painted in the shop with manufacturer's protective coating system.
 - B. Coatings used must be suitable for the intended service and be approved by the Engineer.
 - C. Provide field touch-up materials.

PART 3 – EXECUTION

- 3.01 INSTALLATION:
- A. Owner to install equipment provided herein.
- 3.02 MANUFACTURER'S FIELD SERVICES:
- A. Provide start-up, testing, and training services for all aeration equipment.
 - 1. Furnish the services of qualified field personnel from the Suppliers or manufacturers of Equipment furnished and installed under this Contract, as required to perform all manufacturer's Field Services called for herein. Field personnel shall be certified by the Supplier or manufacturer of the specific product or system as having the necessary knowledge and experience to perform the required functions.
 - 2. Supplier's or manufacturer's field personnel to perform the following:
 - a. Observe the installation, start-up, and testing of Equipment.
 - b. Instruct and guide Owner in proper procedures.
 - c. Supervise the initial start-up, operational check, and any required adjustments of Equipment.
 - d. Instruct Owner's designated personnel in proper operation and maintenance of all Equipment. Supplier or manufacturer shall provide the Owner with one (1) weeks

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notice prior to instruction to allow for scheduling of personnel.

- e. Furnish a written report to Engineer covering all Work done at least once each week and when Work on each item of Equipment or system is completed.
- 3. Advise Engineer of arrival at the Site of all Supplier's and manufacturer's field personnel.
- 4. All other manufacturer's Field Services by such field representatives in connection with start-up, testing, and instruction of Owner's personnel will be furnished at no charge to Owner.

3.03 STARTUP SERVICES:

- A. Owner shall place all Equipment installed under this Contract into successful operation according to instructions of the Supplier, manufacturer, or field representative, who shall be present at the time of startup.
- B. Prior to startup, Supplier, manufacturer, or field representative shall confirm proper installation, lubrication, and alignment of installed equipment as well as proper anchor bolt tensions, grout, and shims.

3.04 PERFORMANCE TESTS:

- A. Manufacturer, Supplier, or field representative to be present during performance tests to be performed by Owner.
 - 1. Owner will conduct acceptance tests after installation to determine if the Equipment installed as part of the Work perform in accordance with Contract Documents and as guaranteed. Final acceptance of Equipment and Substantial Completion will be based on acceptable results of such tests.
 - 2. No tests will be conducted on Equipment for which Supplier's or manufacturer's Field Service is specified unless Supplier's or manufacturer's field representative is present and declares in writing that the Equipment is ready for such test.
 - 3. The tests will be made as set forth in the Contract Documents unless the interested parties mutually agree upon some other manner of testing.
- B. Equipment Tests:
 - 1. The four (4) aerator/mixers installed in the northernmost basin shall be tested for at least thirty (30) minutes continuously.
 - 2. Remaining aerator/mixers installed in other basins will be "bumped" to confirm operability.
 - 3. Check performance of all components as a functioning unit.
 - 4. Power consumption shall be measured for each aerator/mixer and blower motor with a wattmeter. With all units running simultaneously, the transient power consumption of each aerator/mixer and, if applicable, blower motor shall not vary more than plus or minus 5% from the average value for that aerator/mixer or blower.
- C. Aeration equipment which fails to satisfy all specified performance requirements shall be modified or replaced as required. The equipment shall be completely retested after modification or replacement. Modifications and additional equipment shall be provided, and retesting performed, and all structural or electrical modifications necessary to accommodate the modified or replaced equipment shall be made at no additional cost to the Owner.

END OF SECTION 46 41 23