SECTION 01 91 13 – EQUIPMENT AND STARTUP

PART 1 - General

1.1 SCOPE OF WORK

A. Provide competent field services technicians of all equipment furnished to supervise installation, adjustment, initial operation and testing, performance testing, final acceptance testing and startup of the equipment.

1. Provide services of major process equipment manufacturer's representatives as per Technical Specifications.
2. Perform specified equipment field performance tests, final acceptance tests and startup services.
3. Duration of equipment manufacturer's representatives at the facility shall be as long as necessary to demonstrate the equipment meets all requirements of the equipment/system specification including flow rate and constituent removal performance.

1.2 RELATED SECTIONS

A. The related sections are as follows:

1. 01 78 23 Operation and Maintenance Data

1.3 SUBMITTALS

A. In accordance with Section 01 33 00, submit name, address and resume of proposed field services technicians at least 30 days in advance of the need for such services.

B. This section provides general guidelines for various steps required for the equipment startup and testing phase. The Contractor shall prepare and, submit, a detailed Equipment Startup and Testing Plan for equipment testing and startup as specified in the various equipment sections. At a minimum, submittals shall include the following:

1. The Equipment Startup and Testing Plan shall be submitted at least 60 days in advance of the proposed test dates and shall include at least the following information:

   a. Name of equipment to be tested, including reference to specifications section number and title.
   b. Testing schedule of proposed dates and times for testing.
   c. Summary of power, lighting, chemical, water, etc., needs and identification of who will provide them and the quantity needed for testing.
   d. Outline specific assignment of the responsibilities of the Contractor and manufacturers' factory representatives or field service personnel.
   e. Detailed description of step-by-step testing requirements, with reference to appropriate standardized testing procedures and laboratory analyses by established technical organizations (e.g., ASTM, EPA Standard Methods, etc).
   f. Samples of forms to be used to collect and record test data and to present tabulated test results.

2. Copies of test reports upon completion of specified shop, performance and acceptance tests. Test reports shall incorporate the information provided in the test procedures submittals and modified to reflect actual conduct of the tests and the following additional information:

    a. Copy of all test data sheets and laboratory analytical reports.
    b. Summary comparison of specified test and performance requirements vs. actual test results.
    c. Should actual test results fail to meet specified test and performance requirements, describe action(s) to be taken prior to retest the equipment.
    d. Copies of the field service technician's report summarizing the results of his/her initial inspection, operation, adjustment and pre-tests. The report shall include detailed descriptions and tabulations of the points inspected, tests and adjustments made, quantitative results obtained, suggestions for precautions to be taken to ensure proper maintenance, final setting for the equipment, a copy of all the manufacturer's startup checklists and other applicable paperwork.

1.4 QUALITY ASSURANCE

A. Field service technicians shall be competent and experienced in the proper installation, adjustment, operation, testing and startup of the equipment and systems being installed.

B. Manufacturers' sales and marketing personnel will not be accepted as field service technicians.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 PRELIMINARY REQUIREMENTS

A. After installation of the equipment has been completed and the equipment is presumably ready for operation, complete functional test. Verify that the field service technician shall inspect, operate, test and adjust the equipment. The inspection shall include at least the following points where applicable:

1. Soundness (without cracks or otherwise damaged parts).
2. Correctness of setting, alignment and relative arrangement of various parts.
3. Check that all equipment, skids, and piping are properly fastened to a concrete foundation and that all bolts are completely tight.
4. Adequacy and correctness of packing, sealing and lubricants.
5. Check adequacy and tightness of all connections and verification that all power, compressed air, control cabling, communications, and other utilities are properly connected and functional.

B. The operation, testing and adjustment shall be as required to prove that the equipment has been left in proper condition for satisfactory operation under the conditions specified.

C. Upon completion of this work, the field service technician shall submit a signed report of the results of his/her inspection, operation, adjustments and tests. The report shall contain copies of all of the field notes from the inspection.

3.2 STARTUP OF THE PUMP STATION AND RELATED SYSTEMS

A. General Requirements

1. Successfully execute the step-by-step procedure of startup specified herein.
2. The startup shall be successfully executed prior to Substantial Completion and acceptance by the OWNER.

B. Preparation for Startup

1. Upon completion of the pump station and all its related systems, all tanks, equipment and piping shall be flushed with potable water and hydraulically checked for leaks, cracks, and defects.
2. All mechanical and electrical equipment shall be checked to ensure that it is in good working order and properly connected. Preliminary run-ins of the various pumps and other remaining equipment shall be made.
3. All systems shall be cleaned and purged as required Check that all valves shall be checked for proper operation and control, and there are no hindrances to valves fully opening and closing.
4. All instruments and controls shall be calibrated through their full range. All other adjustments required for proper operation of all instrumentation and control equipment shall be made. All settings for all instrumentation shall be recorded and provided in separate cover.
5. No testing or equipment operation shall take place until it has been verified by the OWNER's representative that all specified safety equipment has been installed and is in good working order.
6. No testing or equipment operation shall take place until it has been verified by the OWNER's representative that all lubricants, tools, maintenance equipment, spare parts and approved equipment operation and maintenance manuals have been furnished as specified.

C. Facilities Startup

1. Startup period shall not begin until all new facilities and equipment have been tested as specified and are ready for operation. The OWNER shall receive spare parts, safety equipment, tools and maintenance equipment, lubricants, approved operation and maintenance data and the specified operation and maintenance instruction prior to the startup. All valve tagging shall also be complete prior to this startup.
2. In the event of failure to demonstrate satisfactory performance of the facility on the first or any subsequent attempt, all necessary alterations, adjustments, repairs and replacements shall be made. When the facility is again ready for operation, it shall be brought on line and a new test shall be started. This procedure shall be repeated as often as necessary until the facility has operated continuously to the satisfaction of the OWNER and ENGINEER.
3. The CONTRACTOR shall provide all necessary personnel of the various construction trades, i.e., electricians, plumbers, etc., and field service personnel on as need basis during the following three testing/startup phases.
4. Do not, at any time, during startup allow the facility to be operated in a manner which subjects equipment to conditions that are more severe than the maximum allowable operating conditions and tolerances for which the equipment was designed.

3.3 FINAL PUMP STATION DEMONSTRATION TEST

A. Upon successful completion of performance test as per Para 3.4 above, Contractor shall startup the full system and handover the operations to the OWNER.

EQUIPMENT SUPPLIER'S CERTIFICATE OF OPERATION

OWNER _____

Project _____

Contract No. _____

EQUIPMENT SPECIFICATION SECTION NO. _____

EQUIPMENT DESCRIPTION _____

I _____, Authorized representative of
(Print Name)

_____
(Print Manufacturer's Name)

hereby CERTIFY that _____
(Print equipment name and model with serial no.)

_____

installed for the subject project has (have) been tested, operated and adjusted, and is (are) ready for place in operation for its intended use.

Date_____

Time_____

CERTIFIED BY: _____

(Signature of Manufacturer's Representative)

END OF SECTION