

**SECTION 01730****OPERATING AND MAINTENANCE DATA****PART 1 - GENERAL****1.01 SCOPE OF WORK:**

- A. Prepare Operating and Maintenance (O & M) Manual covering all equipments and systems provided under this project.
- B. Instruct Department's personnel in the operation of equipment and maintenance provided under this project.
- C. This Section covers the services of the manufacturer's representatives and special coordinating services required of the Contractor that shall apply during construction, facilities startup, and training of the Department's personnel for facilities operation.
- D. The Contractor shall inform all subcontractors and manufacturers of the requirements herein and include the following services in his costs for the work. Where a minimum amount of time is stated in the Technical Specifications for manufacturer's services, any additional time required to perform the specified services shall be at no additional cost to the Department.

**1.02 FORM, FORMAT AND SUBMITTALS CONTENTS:**

- A. Operating and Maintenance manuals will be used for use by Miami-Dade Water and Sewer Department personnel in the operation and maintenance of the various systems.
- B. The Department shall be furnished with one set of any special tools required for servicing for each type of equipment actually furnished.
- C. Prepare data in the form of an instructional manual for use by Department's personnel.
- D. Format:
  - 1) Size: 8½ in. x 11 in.
  - 2) Paper: 20-pound minimum, white, for typed pages.
  - 3) Text: Manufacturer's printed data or neatly typewritten.
  - 4) Drawings:
    - (a) Provide reinforced punched binder tab, bind in with text.
    - (b) Fold larger drawings to the size of the text paper.
  - 5) Provide fly-leaf for each separate product, or each piece of operating equipment.
    - (a) Provide typed description of product, and major component parts of equipment.
    - (b) Provide indexed tabs.
  - 6) Cover: Identify each volume with typed or printed title "OPERATING AND MAINTENANCE INSTRUCTIONS". List:
    - (a) Title of Project.
    - (b) Identify of separate structure as applicable.
    - (c) Identity of general subject matter covered in the manual.

- E. Binders:
- 1) Commercial quality three-ring binders with durable and cleanable plastic covers.
  - 2) Maximum ring size: As required (Minimum 1½-inches).
- F. Content of Manual:
- 1) Neatly typewritten table of contents, arranged in a systematic order.
    - (a) Contractor, name of responsible principal, address and telephone number.
    - (b) A list of each product required to be included, indexed to the content of the volume.
    - (c) List, with each product, the name, address and telephone number of:
      - (i) Subcontractor or installer.
      - (ii) Maintenance contractor, as appropriate.
      - (iii) Identify the area of responsibility of each.
      - (iv) Local source of supply for parts and replacement.
    - (d) Identify each product by product name and other identifying symbols as set forth in Contract Documents.
- G. Product Data:
- 1) Include only those sheets which are pertinent to the specific product.
  - 2) Annotate each sheet to:
    - (a) Clearly identify the specific product or part installed.
    - (b) Clearly identify the data applicable in the installation.
    - (c) Delete references to inapplicable information.
- H. Drawings:
- 1) Supplement product data with drawings as necessary to clearly illustrate:
    - (a) Relations of component part of equipment and system.
    - (b) Control wiring, schematic wiring, and flow diagram.
  - 2) Coordinate drawings with information in Project Record Documents to assure correct illustration of completed installation.
  - 3) Do not use Project Record Documents as maintenance drawings.
- I. Written text, as required to supplement product data for the particular installation:
- 1) Organize in a consistent format under separate headings for different procedures.
  - 2) Provide a logical sequence of instructions for each procedure.
- J. Copy of each warranty, bond and service contract issued.
- 1) Provide information sheet for Department's personnel, give:
    - (a) Proper procedures in the event of failure.
    - (b) Instances which might affect the validity of warranties or bonds.

## 1.03 MANUAL FOR EQUIPMENT AND SYSTEMS:

- A. Content, for each unit of equipment and system, as appropriate:
- 1) Description of unit and component parts.
    - (a) Function, normal operating characteristics, and limiting conditions.
    - (b) Performance curves, engineering data and tests.
    - (c) Complete nomenclature and commercial number of all replaceable parts.
  - 2) Operating Procedures:
    - (a) Start-up, break-in, routine and normal operating instructions.
    - (b) Regulation, control, stopping, shut-down, and emergency instructions.
    - (c) Special operating instructions.
  - 3) Maintenance Procedures:
    - (a) Routine operations.
    - (b) Guide to "trouble shooting".
    - (c) Disassembly, repair, and reassembly.
    - (d) Alignment, adjusting, and checking.
  - 4) Servicing and lubrication schedule.
    - (a) List of lubricants required.
  - 5) Manufacturer's printed operating and maintenance instructions.
  - 6) Description of sequence of operation by control manufacturer.
  - 7) Original manufacturer's parts list, illustration, as drawings and diagrams required for maintenance.
    - (a) Predicted life of parts subject to wear.
    - (b) Items recommended to be stocked as spare parts.
  - 8) List of original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.
  - 9) Other data as required under pertinent sections of specifications.
- B. Prepare and include additional data when the need for such data becomes apparent during instruction of Department's personnel.
- C. Additional requirements for operating and maintenance data: The respective sections of Specifications.

#### 1.04 POSTED OPERATING INSTRUCTIONS:

- A. General: Operating instructions and diagrams shall be prepared for posting near the equipment. Posted operating instructions shall be photographic or equal non-fading reproductions framed under glass encased in non-discoloring plastic and shall be mounted in location directed. Copies of the posted operating instructions shall also used with the operating and maintenance manuals as a basis in training employees in the operation and maintenance of systems and related equipment installed.
- B. Contents: Posted operating instructions shall consist of simplified, consolidated equipment, control and power diagrams graphically representing the entire system and actual equipment installed, including concise written instructions on how to start and stop systems, what settings and conditions are to be observed and what control adjustments are to be made or maintained by the operation.

#### 1.05 MANUFACTURER'S NAMEPLATES:

- A. Each major component of equipment to have manufacturer's name, address, model number and rating on a plate securely affixed in a conspicuous place. Nameplate of a distributing agent will not be acceptable in lieu of manufacturer's nameplate.
- B. Nameplate shall be die-stamped, engraved, or etched to guarantee long term legibility.

#### 1.06 GUARANTY/WARRANTY:

- A. The Contractor shall guarantee that all new equipment has the capacity specified and that it will operate without excess noise or vibration.
- B. Contractor shall furnish a written guarantee covering all workmanship and materials for a period of one (1) year, from the date of acceptance. This shall include an agreement to repair or replace, at his expense, all defects that may appear in that time, which in the opinion of the Department, are due to defective workmanship or materials.
- C. Copies of factory warranties on all equipment furnished shall be submitted with the above described, written guarantee period, and included in maintenance manuals.

#### 1.07 OPERATION AND MAINTENANCE RESPONSIBILITY:

- A. Contractor shall provide all required service and maintenance on all equipment installed under this contract for one (1) year following final acceptance or the beginning of beneficial use by the Department. The starting date of one (1) year service period shall be determined by the Department. Included in the service and maintenance to be provided during this one (1) year period, shall be all required lubrication, adjusting belt tensions, eliminating excessive noise and vibration, correcting all electrical and mechanical faults, recording all permanent installed gauge meter and temperature readings, and other general service items, including the answering of service calls.
- B. Services During Construction:

- 1) General: Competent and experienced technical representatives shall represent the manufacturers of all equipment and systems as many days as may be necessary to resolve assembly or installation problems at the worksite which are attributable to, or associated with, the equipment furnished. This requirement applies to manufacturers of all equipment furnished, whether or not specifically set forth in the Technical Specifications.
- 2) Manufacturer's Certificate of Proper Installation: Where called for in the Technical Specifications, the manufacturer's representative shall provide a certificate stating that the equipment or system has been installed in accordance with the manufacturer's recommendation and has been inspected by a manufacturer's authorized representative, that it has been serviced with the proper initial lubricants, that applicable safety equipment has been properly installed, and that the proper electrical and mechanical connections have been made.

C. Functional Testing Assistance:

- 1) Where functional (or run) testing is called for on the Technical Specifications, the manufacturer's representative shall assist with the initial test, which shall include checking for proper rotation, alignment, speed, excessive vibration, and noisy operation. Initial equipment and system adjustment and calibrations shall be performed in the presence of and with the assistance of the manufacturer's representative. The previously specified Manufacturer's Certificate of Proper Installation shall include the statement that proper adjustment have been made and that the equipment or system is ready for plant startup and operation.
- 2) The Contractor, as applicable to the equipment furnished, shall state in writing that all necessary hydraulic structures, piping systems, and valves have been successfully tested; that all necessary equipment systems and subsystems have been checked for proper installation, started, and successfully tested to indicate that they are all operational; that the systems and subsystems are capable of performing their intended functions; and that the facilities are ready for startup and intended operation.

D. Training of Owner's Personnel

Where called for in the Specifications, the manufacturer's representative shall provide detailed instructions to the Departments personnel for operation and maintenance of the specified equipment. These training services shall include pre-startup classroom and onsite equipment instruction and/or post-startup classroom and onsite equipment instruction, as stated in the Specifications.

**PART 2 - PRODUCTS**

(Not used)

**PART 3 - EXECUTION**

(Not used)

END OF SECTION