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**The TEXT indicated with < > is to be selected or filled in by the Specifier to meet the requirements of the project.**

**If any of the SECTIONS (i.e. 1.02, 1.03, etc.) below are not required for the project do NOT delete the Section, but rather change the title of the Section to “NOT USED” (i.e. 1.02 NOT USED) so that numbering of specification references is preserved, and delete the specification language in this Section below the title.**

## **PART 1 GENERAL**

### **1.01 SECTION INCLUDES**

- A. Operating and maintenance data requirements.
- B. Quality assurance.
- C. Form of submittals.
- D. Content of manual.
- E. Manual for materials and finishes.
- F. Manual for equipment and systems.
- G. Submittal schedule.

### **1.02 OPERATING AND MAINTENANCE DATA REQUIREMENTS**

- A. CONTRACTOR shall ensure operating and maintenance data is in the English language.
- B. CONTRACTOR shall compile product data and related information appropriate for UTILITIES' maintenance and operation of products furnished under Contract.
- C. CONTRACTOR shall prepare operating and maintenance data as specified in this section and as referenced in other pertinent sections of Specifications.
- D. CONTRACTOR shall instruct UTILITIES' personnel in maintenance of products and in operation of equipment and systems.

### **1.03 QUALITY ASSURANCE**

- A. CONTRACTOR shall ensure data is prepared by personnel:
  - 1. Trained and experienced in maintenance and operation of described products.
  - 2. Familiar with requirements of this section.
  - 3. Skilled as technical writers to extent required to communicate essential data.
  - 4. Skilled as draftsmen competent to prepare required drawings.

### **1.04 FORM OF SUBMITTALS**

- A. CONTRACTOR shall provide an instructional manual containing instructions for operations and maintenance activities for use by UTILITIES' personnel.
- B. CONTRACTOR shall submit data in an Electronic format, as follows:
  - 1. Searchable Indexed PDF with table of contents.
- C. CONTRACTOR shall also provide a copy in a Hardcopy format, as follows:
  - 1. Sheet size: 8-1/2" x 11" minimum.
  - 2. Paper: 20 lb 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. Larger size drawings shall be folded to 8-1/2" x 11", and inserted into pockets.
  - 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. Identity of separate structure as applicable.
    - c. Identity of general subject matter covered in manual.
  - 7. Binders:
    - a. Commercial quality binders with durable and cleanable plastic covers.
    - b. When multiple binders are used, correlate data into related consistent groupings.

#### 1.05 CONTENT OF MANUAL

- A. The instructional manual shall include a table of contents for each volume, and volumes shall be arranged in a systematic order that includes the following:
  - 1. CONTRACTOR, name of responsible principal, address, and telephone number.
  - 2. List of each product required to be included, indexed to content of volume.
  - 3. List, with each product, name, address, and telephone number of:
    - a. Subcontractor or installer.
    - b. Maintenance contractor, as appropriate.
    - c. Identify area of responsibility of each.
    - d. Local source of supply for parts and replacement and list of recommended spare parts.
  - 4. Identify each product by product name and other identifying symbols as set forth in Contract Documents, including nameplate information and shop order numbers for each item of equipment furnished.
- B. The instructional manual shall include product data, as follows:
  - 1. Include only those sheets which are pertinent to specific product.
  - 2. Annotate each sheet to:
    - a. Clearly identify specific product or part installed.
    - b. Clearly identify data applicable to installation.
    - c. Delete references to inapplicable information.
- C. The instructional manual shall include drawings, as follows:
  - 1. Supplement product data with Drawings as necessary to clearly illustrate:
    - a. Relations of component parts of equipment and systems.
    - b. Control and flow diagrams.
  - 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.
- D. The instructional manual shall include written text, as required to supplement product data for particular installation, as follows:

1. Organize in consistent format under separate headings for different procedures.
  2. Provide logical sequence of instructions for each procedure.
- E. Copy of each warranty, Bond, and service contract issued.
1. Provide information sheet for UTILITIES' personnel, giving:
    - a. Proper procedures in event of failure.
    - b. Instances which might affect validity of warranties or Bonds.

#### 1.06 MANUAL FOR MATERIALS AND FINISHES

- A. CONTRACTOR shall submit < > copies of a complete manual of materials and finishes in final form that includes the following:
1. Contents, for architectural products, applied materials and finishes:
  2. Manufacturer's data, giving full information on products:
    - a. Catalog number, size, composition.
    - b. Color and texture designations.
    - c. Information required for re-ordering special-manufactured products.
  3. Contents, for moisture protection and weather-exposed products:
    - a. Manufacturer's data, giving full information on products:
      - 1) Applicable standards.
      - 2) Chemical composition.
      - 3) Details of installation.
    - b. Instructions for inspection, maintenance, and repair.
  4. Additional requirements for maintenance data: Respective sections of Specifications.

#### 1.07 MANUAL FOR EQUIPMENT, COMPONENTS, DEVICES AND PRE-PACKAGED SYSTEMS

- A. CONTRACTOR shall submit < > copies of a complete manual for equipment, components, devices, and prepackaged systems in final form, that meets the following requirements:
1. Definitions:
    - a. Component – A basic building block of equipment, subsystems and systems that requires installation or functional testing but does not have electrical connections or internal electronics. (Examples: filter effluent piping, manual isolation valves, conductor, conduit, Insulator).
    - b. Device – A basic building block of equipment, subsystems, and systems that requires installation or functional testing and does have electrical connections or internal electronics. (Examples: filter level transmitter, water pump pressure transmitter, AC panel, relays, RTU).
    - c. Equipment – An assembly of component(s) and devices(s) that requires installation or functional testing. (Examples: pump, ozone generator skid, transformer, circuit breaker, switchgear, voltage transformer).
    - d. Subsystem – A building block of systems made up from a grouping of components, devices, and equipment that perform a definable function. (Examples: filter backwash subsystem and sedimentation basin hoseless sludge removal subsystem).
    - e. System – A grouping of subsystems, equipment, components and devices that perform a definable function. (Examples: filter and sedimentation basin, control enclosure).
  2. Contents, for each unit of equipment and pre-packaged system, as appropriate:
    - a. Description of unit and component parts:
      - 1) Function, normal operating characteristics, and limiting conditions.
      - 2) Performance curves, engineering data, and tests.
      - 3) Complete nomenclature and commercial number of replaceable parts.
    - b. Operating procedures:
      - 1) Startup, break-in, routine, and normal operating instructions.
      - 2) Regulation, control, stopping, shutdown, and emergency instructions.
      - 3) Summer and winter operating instructions.
      - 4) Special operating instructions.
    - c. Maintenance procedures:
      - 1) Routine operations.
      - 2) Guide to "trouble-shooting."

- 3) Disassembly, repair, and reassembly.
- 4) Alignment, adjusting, and checking.
- d. Servicing and lubrication schedule: List of lubricants required.
- e. Manufacturer's printed operating and maintenance instructions.
- f. Description of sequence of operation by control manufacturer.
- g. Original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
  - 1) Predicted life of parts subject to wear.
  - 2) Items recommended to be stocked as spare parts.
- h. As-installed control diagrams by controls manufacturer.
- i. Each CONTRACTOR's coordination Drawings. As-installed color-coded piping diagrams.
- j. Chart of valve tag numbers, with location and function of each valve.
- k. List of original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.
- l. Other data as required under pertinent sections of Specifications.
3. Content, for each electrical device and equipment, as appropriate.
  - a. Description of equipment and comprising parts:
    - 1) Function, normal operating characteristics, and limiting conditions.
    - 2) Performance curves, engineering data, and tests.
    - 3) Complete nomenclature and commercial number of replacement parts.
  - b. Circuit directories of panelboards:
    - 1) Electrical service.
    - 2) Controls.
    - 3) Communications.
  - c. As-installed color-coded wiring diagrams.
  - d. Operating procedures:
    - 1) Routine and normal operating instructions.
    - 2) Sequences required.
    - 3) Special operating instructions.
  - e. Maintenance procedures:
    - 1) Routine operations.
    - 2) Guide to "trouble-shooting."
    - 3) Disassembly, repair, and assembly.
    - 4) Adjustment and checking.
  - f. Manufacturer's printed operating and maintenance instructions.
  - g. List of original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.
  - h. Other data as required under pertinent sections of Specifications.
4. Prepare and include additional data when need for such data becomes apparent during instruction of UTILITIES' personnel.
5. Additional requirements for operating and maintenance data: Respective sections of Specifications.

#### 1.08 SUBMITTAL SCHEDULE

- A. CONTRACTOR shall submit an electronic copy of each manuals for each piece of equipment or system in a searchable Indexed PDF format with table of contents via PM SaaS in accordance with Section 01 33 12 – PM SaaS.
- B. CONTRACTOR shall provide a preliminary hardcopy draft and:
  1. Provide <2> copies with shipped equipment.
  2. Submit <2> copies to UTILITIES <and Engineer> <30> days prior to <installation of equipment> <UTILITIES' training>.
  3. UTILITIES <and Engineer> will review draft and return 1 copy with comments.
- C. CONTRACTOR shall submit <3> hardcopies of completed data in final form <15> days prior to final inspection or acceptance.

<Project Number>  
<Project Name>

**PART 2 PRODUCTS**

NOT USED

**PART 3 EXECUTION**

NOT USED

END OF SECTION