

**SECTION 01730****OPERATION, MAINTENANCE AND WARRANTY MANUALS****PART 1 - GENERAL**

## 1.01 RELATED DIVISIONS &amp; SECTIONS

- A. Division I - General Requirements and Covenants
- B. Division II - Special Provisions
- C. Division III - Technical Specifications
  - 1. Section 01300 - Submittals
  - 2. Section 01650 - Contract Closeout

## 1.02 QUALITY CONTROL

- A. Preparation of instructions, data and troubleshooting shall be by personnel experienced in maintenance and operations of the described products.

## 1.03 FORMAT

- A. Prepare data in the form of an instructional manual.
- B. Binders: Commercial quality, 8 1/2 x 11 inch three-ring binders with cleanable clear plastic overlays on the cover and spine, hardback with a two inch diameter D-ring size. When multiple binders are used correlate data into related, consistent grouping.
- C. Cover: Identify each binder cover and spine with typed title OPERATION AND MAINTENANCE INSTRUCTIONS, or WARRANTY MANUAL; list the project title, project number, facility, building number, identify the subject matter of contents and volume number.
- D. Arrange content by trades (Architectural, Mechanical and Electrical) and then by systems, under section numbers and sequence of Table of Contents.
- E. Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- F. Text: Manufacturer's original printed data on 20-pound paper. Photocopies will not be accepted.

- G. Drawings: Provide with reinforced punched, binder tab. Bind in with text. Fold larger drawing to size of text pages and insert in a plastic jacket.
- H. Submit manufacturer's certification that the data and drawing have been reviewed by a party other than the preparer and pertain exactly to the model, size, and series of product and equipment installed in the work.
- I. All products, systems, and drawings must be cross-referenced with the I.D. or Tag numbers indicated on the contract drawings or furnished by the Authority.

#### 1.04 CONTENTS, EACH VOLUME

- A. Table of Contents: Provide title of project, project number; names, addresses, telephone numbers, fax numbers and E-mail addresses of the design engineer, sub consultant and contractor with names of responsible parties; schedule of products and systems, indexed to content of volume. A listing of all relevant I.D. or tag numbers for each volume shall be placed immediately behind the table of contents.
- B. For each product or system: List the names, addresses and telephone numbers, fax numbers, E-mail addresses of subcontractors and suppliers, including local source of supplies and replacement parts.
- C. For each product or piece of equipment provide data sheets which include:
  - 1. Project Title:
  - 2. Project Number:
  - 3. Equipment name:
  - 4. 4. I.D. or Tag Number:
  - 5. Make/Model/Serial Number:
  - 6. Location:
  - 7. Manufacturer Information:  
Name/address/phone/fax/E-mail/contact
  - 8. Local Vendor:  
Name/address/phone/fax/E-mail/contact
  - 9. Warrantee data
- D. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
- E. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
- F. Text: As required to supplement product data. Provide logical sequence of instructions for each procedure including but not limited to check-out, testing, start-up, maintenance, overhauls, repairs, troubleshooting.

### 1.05 MANUAL FOR MATERIALS AND FINISHES

- A. Building products, applied materials and finishes: Include product data with catalog number, size, composition and color, and texture designations. Provide information for re-ordering custom manufactured products. Provide schedule of finishes applied or installed.
- B. Instructions for Care and Maintenance: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance. This information should be based on the specific conditions, exposure, and usage of the project. The manufacturer shall state that they have review the specific application and the procedures for this project.
- C. Moisture Protection and Weather Exposed Products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance and repairs based upon the specific conditions, exposure and usage of the project. The manufacturer shall state that they have review the specific application and the procedures for this project.
- D. Schedule: Prepare a schedule of maintenance tasks and inspections for products which require service. The schedule shall include the frequency of service, type of service, estimated man-hours, parts and consumables, tools required and estimated cost of tools and supplies.
- E. Maintenance Task forms: For each identified maintenance task, inspection and repair procedure, a task form shall be completed which provides specific procedures, tools and equipment required, spare parts, consumables, recommended crew size and man-hours to complete the task.
- F. Additional Requirements: As specified in individual product specification sections.

### 1.06 MANUAL FOR EQUIPMENT AND SYSTEMS

- A. Each item of equipment and each system: Include description of unit or system, and components parts. Identify function, normal operating characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.
- B. Data submitted on all equipment shall include complete maintenance instructions (including preventative and corrective maintenance) and parts lists in sufficient detail to facilitate ordering replacements.
- C. Include color coded wiring diagrams as installed.

- D. Operating procedures: Include start-up, break-in, and routine normal operating instructions and sequence. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any other special operating instructions.
- E. Provide servicing and lubrication schedule, and list lubricants required. Cross-reference lubricants to products offered by at least three major lubricant suppliers.
- F. Include manufacturer's printed operation and maintenance instructions.
- G. Include sequence of operation by controls manufacturer.
- H. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- I. Provide control diagrams by controls manufacturer is installed.
- J. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams, and "as-built" drawings. Diagrams and drawings shall have color coded piping consistent with the Authority's standards.
- K. Provide a list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- L. Include test and balancing reports, calibration data, alignment records, and other field inspection reports associated with check-out and start-up.
- M. Schedule: Prepare a schedule of maintenance tasks and inspections for products which require service. The schedule shall include the frequency of service, type of service, estimated man-hours, parts and consumables, tools required and estimated cost of tools and supplies.
- N. Maintenance Task forms: For each identified maintenance task, inspection and repair procedure, a task form shall be completed which provides specific procedures, tools and equipment required, spare parts, consumables, recommended crew size and man-hours to complete the task.
- O. Additional Requirements: As specified in individual product specification sections.

#### 1.07 MANUAL FOR WARRANTIES, GUARANTEES AND SERVICE AGREEMENTS

- A. Table of Contents: Provide title of project, project number; names, addresses, telephone numbers, fax numbers and E-mail addresses of the design engineer, sub consultant and contractor with names of responsible parties; schedule of products and system components, indexed to content of volume.

- B. For each product, manufacturer or system component: List the name, addresses and telephone numbers, fax numbers, E-mail addresses of manufacturers and suppliers, including local source of supplies and replacement parts. The list shall include the start date and end date of the warranty period.
- C. Provide original warranties with signatures of authorized representatives for each product which provides warranty coverage greater than the base warranty provided by the Contractor.
- D. For systems or components that require a service agreement to be included as part of the technical specifications, provide an executed copy of the agreement. The agreement shall state the services to be provided, furnish the procedures to be followed to request service, and 24-hour emergency contact procedures.

#### 1.08 SUBMITTALS

- A. Submit 3 copies of original quality, marked preliminary draft or proposed formats and outlines of contents to the Engineer prior to assembling the final versions.
- B. Incorporate comments from the preliminary draft submittal as required.
- C. Submit 6 copies of the revised volumes in final format prior to Substantial Completion. The Authority's acceptance of a project as Substantially Complete is conditional on the ability to operate and maintain the equipment in accordance with the approved Operations and Maintenance manuals.

#### **PART 2 - PRODUCTS**

Not Used

#### **PART 3 - EXECUTION**

Not Used

**END OF SECTION 01730**