

DIVISION 1 GENERAL REQUIREMENTS

SECTION 01 7823

OPERATIONS AND MAINTENANCE DATA

PART I - GENERAL

1.01. Summary

A. Section Includes:

1. Administrative and procedural requirements for preparing operations and maintenance manuals, including the following:
 - a. Operations and maintenance documentation directory.
 - b. Emergency manuals.
 - c. Operations manuals for systems, subsystems, and equipment.
 - d. Maintenance manuals for the care and maintenance of products, materials and finishes, systems, and equipment.

1.02. Definitions

A. O&M Manual or Manual:

1. Any operations manual, maintenance manual, emergency manual, or directory, described in this Section 01 7823 or other applicable portion of Contract Documents.

B. System:

1. An organized collection of parts, equipment, or subsystems united by regular interaction.

C. Subsystem:

1. A portion of a system with characteristics similar to a system.

1.03. Requirements

A. Content and Form all Operations and Maintenance (O&M) Manuals.

1. The specific content and format requirements for all O&M manuals are detailed herein, under Products, Part 2, and in the individual Specifications. The O&M Manuals will be submitted in both hard copy and electronic form. The electronic form will be compiled in the most current form of Adobe Acrobat, Release 7.0 or better. The electronic file will be bookmarked according to its Table of Contents, but will contain no less than the book marking identification in descending order of section, system, subsystem, equipment, component, etc., where applicable. The goal is to make the manuals both manageable and user friendly for the Owner's use.
2. All manual documents must be word searchable, scanned images of text will not be acceptable.

- B. Design-Build Team Design Team Contribution. The Design-Build Team will include, in the beginning of each O&M manual, a separate section describing the systems, including:
 - 1. The Basis of Design narrative prepared by the Design-Build Team's Designers, updated to as-built status by the Designers.
 - 2. Simplified, professionally-drawn, single-line system diagrams on 8 ½" x 11" or 11" x 17" sheets. These must include water system, supply air systems, exhaust systems etc. These must show major pieces of equipment such as pumps, control valves, service valves, electrical distribution and controls systems, security systems, elevator, space monitoring systems, lighting, fire suppression systems, etc.
- C. Owner Review and Approval.
 - 1. Prior to completion, the Owner will review the O&M manuals, documentation, and redlined as-builts to verify compliance with the Performance Criteria and other applicable Contract Documents (including Bridging Documents). The Owner will also review each equipment warranty to verify that all requirements to keep the warranty valid are clearly stated. The Owner will communicate observed deficiencies to the Design-Build Team for correction, but no Owner review or failure to observe deficiencies or request corrections will limit any other Design-Build Team obligation under Contract Documents.

1.04. Submittals

- A. Initial Submittal:
 - 1. Prepare and submit two (2) draft copies of each manual (emergency, operations, maintenance, and directory) within sixty (60) days following completion of the construction phase submittal process, but in no case later than one hundred and twenty (120) days prior to completion. The drafts will be reviewed, approved, and corrections noted where applicable by the Owner.
 - 2. The Owner will also mark on draft directories whether general scope and content are acceptable.
- B. Final Submittal:
 - 1. Following a satisfactory approval of the draft by the Owner, submit two copies of each manual in final form at least sixty (60) days before completion. The Owner will return one copy with any further comments within thirty (30) days before completion.
 - 2. Correct or modify each manual to comply with the Owner's comments. Submit 3 copies of each corrected manual and two copies on CD-R of the electronic file(s) of the corrected manual within fifteen (15) days of receipt of the Owner's comments and prior to the commencement of any training related activities.

1.05. Coordination

- A. General:
 - 1. Where operation and maintenance documentation includes information on installations by more than one factory-authorized service representative, assemble and coordinate information furnished by representatives and prepare manuals.

PART II - - PRODUCTS

2.01. Operation and Maintenance Documentation Directory

- A. Operations and Maintenance Documentation Directory:
 - 1. Prepare a separate manual that provides an organized reference to each type of manual, including without limitation emergency, operations, and maintenance manuals.
- B. Organization:
 - 1. Include a Section in the directory for each of the following:
 - a. Master table of contents for directory.
 - b. List of contacts.
 - c. List of systems and subsystems.
 - d. List of equipment.
 - e. Tables of contents.
- C. List of Contacts
 - 1. List systems/equipment contacts; list by system, alphabetically.
- D. List of Systems and Subsystems:
 - 1. List systems alphabetically. Include references to operations and maintenance manuals that contain information about each system.
- E. List of Equipment:
 - 1. List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
- F. Tables of Contents:
 - 1. Include every table of contents for each emergency, operation and maintenance manual.
- G. Identification:
 - 1. In the documentation directory and in each operations and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Construction Documents. If no designation exists, assign a designation according to American Society of Heating Refrigerating & Air Conditioning Engineers (ASHRAE) Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

2.02. Manuals, General

- A. Organization:

1. Unless otherwise required, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system.
2. Each manual must contain the following materials, in the order listed:
 - a. Title page.
 - b. Table of contents.
 - c. Manual contents.

B. Title Page:

1. Enclose title page in transparent plastic sleeve. Include the following information:
 - a. Subject matter included in manual.
 - b. Name and address of Project.
 - c. Date of submittal.
 - d. Name, address, and telephone number of Design-Build Team.
 - e. Cross-reference to related systems in other operations and maintenance manuals.

C. Table of Contents:

1. List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in final Contract Documents.
2. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.

D. Manual Contents:

1. Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
2. Binders: Heavy-duty, 3-ring, vinyl-covered, loose-leaf D-ring binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
 - a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
 - b. Identify each binder on front and spine, with printed title "OPERATIONS AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents. Indicate volume number (and volume count) for multiple-volume sets.
3. Dividers: Heavy-paper dividers with plastic-covered tabs for each Section. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the Section on each divider, cross-referenced to Specification Section number and title of Contract Documents.
4. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software diskettes for computerized electronic equipment.
5. Supplementary Text: Prepared on 8-1/2-by-11-inch white bond paper.
6. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.

- a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
- b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

E. Manufacturers' Data:

1. Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Construction Documents. Identify data applicable to the Work and delete references to information not applicable.
2. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.

F. Drawings:

1. Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in Project Record Drawings to ensure correct illustration of completed installation.
2. Do not use original KCJF Project Record Documents as part of operation and maintenance manuals.
3. Comply with requirements of newly prepared Record Drawings in Section 01 7839, Project Record Documents.

2.03. Emergency Manuals

A. Emergency Manual:

1. Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by the Owner for types of emergencies required.

B. Content:

1. Organize manual into a separate section for each of the following:
 - a. Type of emergency.
 - b. Emergency instructions.
 - c. Emergency procedures.

C. Type of Emergency:

1. Where applicable for each type of emergency required below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
 - a. Fire.
 - b. Flood.
 - c. Gas leak.
 - d. Water leak.

- e. Power failure.
- f. Water outage.
- g. System, subsystem, or equipment failure.
- h. Chemical release or spill.

D. Emergency Instructions:

- 1. Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of the Owner for notification of Installer, supplier, and manufacturer to maintain warranties.

E. Emergency Procedures:

- 1. Include the following, as applicable:
 - a. Instructions on stopping.
 - b. Shutdown instructions for each type of emergency.
 - c. Operating instructions for conditions outside normal operating limits.
 - d. Required sequences for electric or electronic systems.
 - e. Special operating instructions and procedures.

2.04. Operations Manuals

A. Operations and Maintenance Manuals:

- 1. Assemble a complete set of operations and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
- 2. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
- 3. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by the Owner.
- 4. Prepare a recommended general overall preventative maintenance manual and include a schedule for use by the Owner.

B. Content:

- 1. In addition to requirements in this Section, include operations data required in individual Specification Sections and the following information:
 - a. Contacts.
 - 1) List names,
 - 2) Addresses,
 - 3) Phone numbers (direct contact, where possible)
 - 4) Email addresses.
 - b. System, subsystem, and equipment descriptions.
 - c. Performance and design requirement if Design-Build Team is delegated design responsibility.
 - d. Operating standards.
 - e. Operating procedures.
 - f. Operating logs.
 - g. Wiring diagrams.
 - h. Control diagrams.
 - i. Piped system diagrams.
 - j. Precautions against improper use.

- k. License requirements including inspection and renewal dates.
- C. Descriptions:
- 1. Include the following:
 - a. Product name and model number.
 - b. Manufacturer's name.
 - c. Equipment identification with serial number of each component.
 - d. Equipment function.
 - e. Operating characteristics.
 - f. Limiting conditions.
 - g. Performance curves.
 - h. Engineering data and tests.
 - i. Complete nomenclature and number of replacement parts.
- D. Operating Procedures:
- 1. Include the following, as applicable:
 - a. Startup procedures.
 - b. Equipment or system break-in procedures.
 - c. Routine and normal operating instructions.
 - d. Regulation and control procedures.
 - e. Instructions on stopping.
 - f. Normal shutdown instructions.
 - g. Seasonal and weekend operating instructions.
 - h. Required sequences for electric or electronic systems.
 - i. Special operating instructions and procedures.
- E. Systems and Equipment Controls:
- 1. Describe the sequence of operation, and diagram controls as installed.
- F. Piped Systems:
- 1. Diagram piping as installed, and identify color-coding where required for identification.

2.05. Product Maintenance Manuals

- A. Product Maintenance Manual:
- 1. Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- B. Content:
- 1. Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- C. Source Information:
- 1. List each product included in manual identified by product name and arranged to match manual's table of contents. For each product, list name, address, and

telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Contract Documents.

D. Product Information:

1. Include the following, as applicable:
 - a. Product name and model number.
 - b. Manufacturer's name.
 - c. Color, pattern, and texture.
 - d. Material and chemical composition.
 - e. Reordering information for specially manufactured products.

E. Maintenance Procedures:

1. Include manufacturer's written recommendations and the following:
 - a. Inspection procedures.
 - b. Types of cleaning agents to be used and methods of cleaning.
 - c. List of cleaning agents and methods of cleaning detrimental to product.
 - d. Schedule for routine cleaning and maintenance.
 - e. Repair instructions.

F. Repair Materials and Sources:

1. Include lists of materials and local sources of materials and related services.

G. Warranties and Bonds:

1. Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
2. Include procedures to follow and required notifications for warranty claims.

2.06. Maintenance Manual Information for Systems and Equipment

A. Content:

1. For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.

B. Source Information:

1. List each system, subsystem, and piece of equipment included in manual identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Contract Documents.

C. Manufacturers' Maintenance Documentation:

1. Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
 - a. Standard printed maintenance instructions and bulletins.

- b. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
- c. Identification and nomenclature of parts and components.
- d. List of items recommended to be stocked as spare parts.

D. Maintenance Procedures:

- 1. Include the following information and items that detail essential maintenance procedures:
 - a. Test and inspection instructions.
 - b. Troubleshooting guide.
 - c. Precautions against improper maintenance.
- 2. Disassembly; component removal, repair, and replacement; and reassembly instructions.
- 3. Aligning, adjusting, and checking instructions.
- 4. Demonstration and training videotape, if available.

E. Maintenance and Service Schedules:

- 1. Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
- 2. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
- 3. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

F. Spare Parts List and Source Information:

- 1. Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

G. Maintenance Service Contracts:

- 1. Include copies of service and maintenance agreements provided by the supplier or manufacturer of any equipment or materials used in the Project and provided by any subcontractors that performed any portion of the Project Work. The duration of any service or maintenance agreements supplied to Owner shall be from the date of Final Completion of the Project Work. Provide each with name and telephone number of service agent.

H. Warranties and Bonds:

- 1. Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
- 2. Include procedures to follow and required notifications for warranty claims.

PART III - EXECUTION – NOT USED

END OF SECTION