SECTION 017823 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for preparing and submitting operations and maintenance manuals for all of the equipment and materials incorporated into the completed project.

B. Related Sections include the following:

1. Division 1 Section "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.
2. Division 1 Section "Closeout Procedures" for submitting operation and maintenance manuals.

1.3 SUBMITTALS

A. Initial Submittal: Submit 2 draft copies of each manual at least 15 days before requesting inspection for Substantial Completion. Include a complete operation and maintenance directory. Engineer will return one copy of draft and mark whether general scope and content of manual is acceptable.

1. Correct or modify draft manual to comply with Engineer's comments.

B. Final Submittal: Submit five (5) copies of corrected draft manual in final form at least 15 days before final inspection.

PART 2 - PRODUCTS

2.1 MANUALS, GENERAL

A. Organization: Organize the manual as follows:

1. Title page
2. Table of contents
3. Manual contents

B. Title Page: Include the following information in the Title Page:

1. Name and address of Project
2. Name and address of Owner

3. Name and address of Engineer
4. Name and address of Contractor
5. Date of Submittal

C. Table of Contents: Provide the following sections in the Manual.

1. Mechanical Equipment
2. Lighting and Miscellaneous Electrical Components
3. Plumbing
4. Emergency Generator and ATS

D. Manual Assembly: Assemble the manual as follows:

1. Binders: Heavy-duty, 3 ring, vinyl-covered, loose-leaf binders, in thickness necessary 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 complete operation and maintenance data of a system, organize data in each binder into groupings by major plant system 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 "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents. Indicate volume number for multiple-volume sets.

2. 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 Project Manual.
3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software diskette for computerized electronic equipment.
4. Supplementary Text: Prepared on 8-1/2-by-11-inch white bond paper.
5. 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 type written pages indicating drawing titles, descriptions of contents and drawing locations.

2.2 EMERGENCY OPERATION

A. Content: When appropriate, include for each items of equipment, procedures for emergency operation and attach the following:

B. Type of emergency

1. Emergency instructions
2. Emergency procedures

C. Type of Emergency: For each type of emergency indicated below, include instructions and procedures, as applicable, for each system, piece of equipment and component:

1. Fire
2. Flood
3. Water leak
4. Power failure
5. Water outage
6. Equipment failure
7. Chemical release or spill

D. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier and manufacturer to maintain warranties.

E. Emergency Procedures: Include the following, as applicable:

1. Instructions on stopping
2. Shutdown instructions for each type of emergency
3. Operating instructions for conditions outside normal operating limits.
4. Required sequences for electric or electronic systems
5. Special operating instructions and procedures.

2.3 STANDARD OPERATION

A. Content: For each plant component or item of equipment provide the following:

1. System and equipment descriptions
2. Operating standards
3. Operating procedures
4. Wiring diagrams
5. Control diagrams
6. Precautions against improper use
7. License requirements including inspection and renewal date

B. Descriptions: Include the following:

1. Product name and model number
2. Manufacturer's name
3. Equipment identification with serial number of each component
4. Equipment function
5. Operating characteristics

6. Limiting conditions
7. Performance curves
8. Engineering data and tests
9. Complete nomenclature and number of replacement parts

C. Operating Procedures: Include the following, as applicable:

1. Startup procedures
2. Equipment or system break-in procedures
3. Routine and normal operating instructions
4. Regulation and control procedures
5. Instructions on stopping
6. Normal shutdown instructions
7. Seasonal and weekend operating instructions
8. Required sequences for electric or electronic systems
9. Special operating instructions and procedures

D. Systems and Equipment Controls: Describe the sequence of operation and diagram controls as installed.

2.4 MAINTENANCE REQUIREMENTS

A. Content: 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.

B. Source Information: 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 Project Manual.

C. Product information : Include the following, as applicable:

1. Product name and model number
2. Manufacturer's name
3. Color, pattern and texture
4. Material and chemical composition
5. Reordering information for specially manufactured products

D. Maintenance Procedures: Include manufacturer's written recommendations and the following:

1. Inspection procedures
2. Types of cleaning agents to be used and methods of cleaning
3. List of cleaning agents and methods of cleaning detrimental to product
4. Schedule for routine cleaning and maintenance
5. Repair instructions

E. Repair Materials and Sources: Include lists of materials and local sources of material and related services.

F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

2.5 SYSTEMS AND EQUIPMENT MAINTENANCE MANUAL

A. Content: 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: 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 Project Manual.

C. Manufactures' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part of piece of equipment.

1. Standard printed maintenance instructions and bulletins.
2. Drawings, diagrams, instructions required for maintenance, including disassembly and component removal, replacement and assembly.
3. Identification and nomenclature of parts and components
4. List of items recommended to be stocked as spare parts

D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures.

1. Test and inspection instructions
2 Troubleshooting guide
3. Precautions against improper maintenance
4. Disassembly; component removal, repair, and replacement; and reassembly instructions
5. Aligning, adjusting and checking instructions
6. Demonstration and training videotape, if available

E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service and standard time allotment.

1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual and annual frequencies.

2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

F. Spare Parts List and Source Information: Include lists of replacements and repair parts, with parts identified and cross-referenced to manufactures' maintenance documentation and local sources of maintenance materials and related services.

G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.

H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation and maintenance manuals.

B. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's personnel for types of emergencies indicated.

C. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material and finish incorporated into the Work.

D. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.

1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem and piece of equipment not part of a system.
2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

E. Manufacturer's Data: 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 Contract Documents. Identify data applicable to the Work, and delete references to information not applicable.

1. 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: 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 Record Drawings to ensure correct illustration of completed installation.

1. Do not use original Project Documents as part of operation and maintenance manuals.
2. Comply with requirements of newly prepared Record Drawings in Division 01 Section "Project Record Documents."

G. Comply with Division 1 Section "Closeout Procedures" for schedule operation and maintenance documentation.

END OF SECTION 017823