SECTION 01730

OPERATING AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK:

A. Compile product data and related information appropriate for the University of Colorado's maintenance and operation of products furnished.

B. Prepare operating and maintenance data as specified in this section and as referenced in other pertinent sections of specifications.

C. Instruct the University of Colorado, Facilities Management personnel in the maintenance of products and in the operation of equipment and systems.

1.2 QUALITY ASSURANCE:

A. Preparation of data shall be done by personnel:

1. Trained and experienced in maintenance and operation of the described products.

2. Completely familiar with requirements of this section.

3. Skilled as a technical writer to the extent required to communicate essential data.

4. Skilled as a draftsman competent to prepare required drawings.

1.3 SUBMITTALS:

A. Prepare data in the form of an instructional manual for use by the University of Colorado, Facilities Management personnel. Five copies are required.

B. Format:

1. Size: 8-1/2" X 11".

2. Paper: 20 lb. minimum, white, for typed pages.

3. Text: Manufacturer's printed data or neatly typewritten.

4. Drawings: As required
   a. Provide reinforced punched binder tab; bind in with text.
b. Fold larger drawings to the size of text pages.

5. Provide fly-leaf for each separate product or for each piece of operating equipment.

6. Cover: Identify each volume with typed or printed title "OPERATING AND MAINTENANCE INSTRUCTIONS" and list:

   a. Title of project and date of completion (month and year).
   
   b. Identify each separate system as applicable.
   
   c. Identify general subject matter covered in the manual.

C. Binders:

   1. Commercial quality, three-ring binders with durable and cleanable plastic covers shall be provided.
   
   2. When multiple binders are used, correlate the data into related consistent groupings.

1.4 CONTENT OF MANUAL:

   A. A neatly typewritten table of contents shall be provided for each volume, arranged in a systematic order with figures and tables listed.

   1. Include the following:

   a. Name of responsible installing principal contractor, 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:

       1) Maintenance contractor, as appropriate.
       
       2) Identity of the area of responsibility of each.
       
       3) Local source of supply for parts and replacement.

   DESIGN TEAM IS TO COMPILE A PROJECT SPECIFIC LIST (IN COOPERATION WITH THE UNIVERSITY REPRESENTATIVE) OF O&M REQUIREMENTS AND INCLUDE THAT LIST IN THIS SECTION. THIS LIST SHOULD ALSO BE INCLUDED IN THE O&M MANUALS.
d. Identify each product by product name and other identifying symbols.

B. Product Data:

1. Include only those sheets that 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 to the installation.
   c. Delete references to inapplicable information.

C. Drawings:

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 drawings to ensure correct illustration of completed installation.

3. Do not use project record drawings as maintenance drawings.

D. Provide 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.

E. Provide a copy of each warranty, bond, and service contract issued. Provide information sheets for the University of Colorado, Facilities Management's personnel and give:

1. Proper procedures in the event of failure.

2. Instances that might affect the validity of warranties or bonds.

1.5 MANUALS FOR MATERIAL AND FINISHES:

A. Submit three (3) copies of complete manual in final form.
B. Content for architectural products include applied materials and finishes.
   1. Manufacturer's data, giving full information on products.
   2. Catalog number, size, and composition.
   3. Color and texture designations.
   4. Information required for reordering special manufactured products.
   5. Instructions for care and maintenance:
      a. Manufacturer's recommendation for types of cleaning agents and methods.
      b. Cautions against cleaning agents and methods that are detrimental to the product.
      c. Recommended schedule for cleaning and maintenance.

C. Content for moisture-protection and weather-exposed products:
   1. Provide manufacturer's data, giving fully information on products.
      a. Applicable standards.
      b. Chemical composition.
      c. Details of installation.
   2. Provide instructions for inspection, maintenance, and repair.

1.6 MANUAL FOR EQUIPMENT AND SYSTEMS:

A. Submit three (3) copies of complete manual in final form.

B. Content for each unit of equipment and system, as appropriate shall contain:
   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, shutdown, and emergency instructions.

c. Summer and winter operating instructions.

d. Special operating instructions.

3. Maintenance Procedures:

a. Routine operations.


c. Disassembly, repair, and reassembly.

d. Alignment, adjustment, and checking.

e. Servicing and Lubrication Schedule, including a list of lubricants required.

f. Manufacturer's printed operating and maintenance instructions.

g. Description of sequence of operation by control manufacturer.

h. 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.

i. List of original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.

C. Content for each electric and electronic system, as appropriate, shall contain:

1. Description of System 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 replaceable parts.

2. Operating Procedures:

a. Routing and normal operating instructions.

b. Sequences required.
3. Maintenance Procedures:
   a. Routing operations.
   c. Disassembly, repair, and reassembly.
   d. Adjustment and checking.

4. Manufacturer's printed operating and maintenance instructions.

5. List of original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.

D. Prepare and include additional data when the need for such data becomes apparent during instruction of the University of Colorado, Facilities Management's personnel.

E. HVAC controls systems shall be submitted separately and shall include cutsheets, controls schematic diagrams, as-built (record) drawings and an as-built CAD disk.

1.7 SUBMITTAL SCHEDULE:

A. Submit two copies of preliminary draft of proposed formats and outlines of contents prior to start of work. The Architect will review draft and return one copy with comments.

B. Submit one copy of complete data in final form 15 days prior to final selection or acceptance. Copy will be returned after final inspection with comments.

C. Submit specified number of copies of approved data in final form prior to acceptance.

1.8 INSTRUCTION OF UNIVERSITY OF COLORADO, FACILITIES MANAGEMENT PERSONNEL:

A. Prior to final inspection or acceptance, fully instruct the University of Colorado, Facilities Management personnel's designated operating and maintenance personnel in the operation, adjustment, and maintenance of all products, equipment, and systems.

B. Operating and maintenance manual shall constitute the basis of instruction.

C. Review contents of manual with University of Colorado, Facilities Management
personnel in full detail to explain all aspects of operations and maintenance.

1.9 FRAMED OPERATING AND MAINTENANCE INSTRUCTIONS:

A. All mechanically and electrically operated equipment and controls shall be provided with legible and complete wiring diagrams, schematics, operating instructions, and pertinent preventive maintenance instructions in a sturdy frame with clear glass or plastic cover. Utilize non-fading, permanent media.

B. Frames shall be located in the same room or service enclosure as the equipment, or in the nearest mechanical or electrical room.

C. Submit proposed instructions to Architect for review and acceptance prior to installation.

PART 1.2 - MATERIALS

2.1 SCHEDULE OF 0&M CONTENTS.

PART 3- EXECUTION

Not Used.

END OF SECTION 01730