

**1 General**

**1.1 OPERATING AND MAINTENANCE MANUAL**

1. Six weeks prior to application for Certificate of Acceptance of the Work, submit to the Contract Administrator, three final copies of operating and maintenance manuals in English.
2. Organize data in the form of an instructional manual.
3. Binders: vinyl, hard covered, 3 D ring, loose leaf 219 mm x 279 mm (8-1/2"x 11") with spine and face pockets.
4. When multiple binders are used, correlate data into related consistent groupings. Identify contents of each binder on spine.
5. Cover: Identify each binder with type or printed title 'Delivery Record Documents'; list title of project and identify subject matter of contents.
6. Table of Contents, each binder: Provide title of project:
  1. date of submission; names,
  2. addresses, and telephone numbers of Contract Administrator and Contractor with name of responsible parties;
  3. schedule of products and systems, indexed to content of volume.
7. Arrange content by systems, under Section numbers and sequence of Table of Contents.
8. Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
9. Text: Manufacturer's printed data, or typewritten data.
10. For each product or system: List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
11. Product Data and Shop Drawings: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation; delete inapplicable information.
12. Other Documents: Maintain manufacturer's certifications, inspection certifications, field test records, survey plans, required by individual specifications sections.
13. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
  1. Provide CD including digital BIM drawings on one of the following formats:
    1. 1:1 scaled CAD files in dwg format.
14. Equipment and Systems
  1. Each Item of Equipment and Each System: Include description of unit or system, and component parts. Give function, normal operation characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.
  2. Switchboard Circuits: Provide electrical service characteristics, controls, and communications.
    1. Include installed colour coded wiring diagrams.
  3. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

4. Maintenance Requirements: Include routine procedures and guide for troubleshooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
  5. Provide servicing and lubrication schedule, and list of lubricants required.
  6. Include manufacturer's printed operation and maintenance instructions.
  7. Include sequence of operation by controls manufacturer.
  8. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
  9. Provide installed control diagrams by controls manufacturer.
  10. Provide list of original manufacturer's and recommended quantities to be maintained in storage.
  11. Additional requirements: As specified in individual specification sections.
15. Materials and Finishes
1. Building Products, Applied Materials, and Finishes: Include product data, with catalogue number, size, composition, and colour and texture designations.
  2. Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
  3. Moisture-protection and Weather-exposed Products: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
  4. Additional Requirements: As specified in individual specifications sections.

**END OF SECTION**