

1 REFERENCES

- .1 OAA/OGCA Document 100; OAA/OGCA Take-Over Procedures.

2 OPERATION AND MAINTENANCE MANUALS

.1 General

- .1 Prepare Operation and Maintenance Manual during the course of construction and have completed prior to Date of Substantial Performance.

.2 Submission

- .1 Maintain one copy of the Operation and Maintenance Manual volume(s) for periodic review and comment, as requested by the Consultant during the course of construction.
- .2 Submit two (2) final hard copies and one (1) USB device with PDF version of all documents of the final completed volume(s) with the application for Substantial Performance in accordance with OAA/OGCA Document 100.

.3 Format

- .1 Bind data in commercial quality, 219 x 279mm, "D" ring binders, having clear cover and spline pockets.
- .2 Identify each binder on the cover and spline with the following:  
OPERATION & MAINTENANCE MANUALS

City of Barrie  
Barrie Fire Station 6  
845 Maplevue Drive East  
Barrie, Ontario

VOLUME \_\_\_\_ OF \_\_\_\_

- .3 Provide table of contents and index tab sheets for each volume. Itemize and tabulate contents.
- .4 Provide drawings with reinforced punched binder tab, or insert into clear sleeves in folded format. Group drawings as to content, and index for quick reference.

.4 Contents - Each Volume

- .1 Table of Contents: provide title of Project, Date of submission and names:
  - .1 Addresses, and telephone numbers of Consultant and Contractor with name of responsible parties;
  - .2 Schedule of products and systems, indexed to content of volume.
- .2 For each product or system: List names, addresses and telephone numbers of sub-contractors and suppliers, including local source of supplies and replacement parts.

- .3 Product Data: mark each sheet to identify specific products and component parts, and data applicable to installation; delete inapplicable information.
  - .4 Operation and Maintenance Manuals shall contain, as a minimum, the following information:
    - .1 List of Contents; cross-referenced to each Volume.
    - .2 Contact information for maintenance and repairs
    - .3 Warranty and guarantee certificates
    - .4 Equipment start-up and troubleshooting instructions
    - .5 Equipment schematics & diagrams
    - .6 Catalogue of all maintenance materials and quantities
    - .7 Complete list of Contractor, Subcontractors and suppliers, indicating name, address, telephone & fax numbers, email addresses, name of contact person and description of work done.
    - .8 Complete list of products used in the work, indicating product name and manufacturer for each listing.
    - .9 Copy of Finish Hardware List, complete with all amendments and revisions, if applicable.
    - .10 Schedule of paints and coatings. Include sufficient explanation to fully identify each surface with the applicable paint or coating used. Enclose copy of Colour Schedule.
    - .11 All "reviewed" shop drawings.
    - .12 Maintenance instructions for all finished surfaces.
    - .13 Brochures and cuts of all equipment and fixtures.
    - .14 Operating and maintenance instructions for all equipment.
    - .15 All Warranties and Guarantees required by the Specifications for this Work.
  - .5 Refer to Division 21, 22 and 23 for more specific mechanical data required beyond the description of this paragraph.
  - .6 Refer to Division 26 for more specific electrical data required beyond the description of this paragraph.
  - .7 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
  - .8 Typewritten Text: as required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.
- 3 AS-BUILT DRAWINGS
- .1 Record information on a clean set of black line opaque drawings, provided by Owner.
  - .2 Maintain as-built drawings on site and update as construction progresses. Allow periodic review by Consultant as requested.
  - .3 Record information concurrently with construction progress. Do not conceal work until required information is recorded.

- .4 Contract drawings and shop drawings: legibly mark each item to record actual construction, including:
  - .1 Measured depths of elements of foundation in relation to finish first floor datum.
  - .2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
  - .3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
  - .4 Field changes of dimension and detail.
  - .5 Changes made by change orders.
  - .6 Details not on original Contract Drawings.
  - .7 References to related shop drawings and modifications.

**4 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 Panel board circuit directories: provide electrical service characteristics, controls, and communications.
- .3 Include installed colour coded wiring diagrams.
- .4 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.
- .5 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- .6 Provide servicing and lubrication schedule, and list of lubricants required.
- .7 Include manufacturer's printed operation and maintenance instructions.
- .8 Include sequence of operation by controls manufacturer.
- .9 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- .10 Provide installed control diagrams by controls manufacturer.
- .11 Provide Contractor's coordination drawings, with installed colour coded piping diagrams.
- .12 Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

- .13 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
  - .14 Include all test and balancing reports
  - .15 Additional requirements: As specified in individual specification sections.
- 5 MATERIALS AND FINISHES
- .1 Building Products, Applied Materials, and Finishes: include product data, with catalogue number, size, composition, and colour and texture designations. Provide information for re-ordering custom manufactured products.
  - .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.
- 6 MAINTENANCE MATERIALS, SPARE PARTS & TOOLS
- .1 Provide spare parts in quantities specified in individual specification sections. Provide identical items to those installed in the Work.
  - .2 Provide maintenance materials in quantities specified in individual specification sections. Provide identical items of same manufacturer, dye lot or production run as items in the Work.
  - .3 Provide special tools in quantities specified in individual specification sections, and tag items identifying their function and equipment or products to which they are associated.
  - .4 Receive and catalogue all items. Check inventory and include approved listings in Operations and Maintenance Manual.
  - .5 Obtain receipts for delivered products and submit prior to Substantial Performance.
  - .6 Quality
    - .1 Spare parts, maintenance materials and special tools provided shall be new, not damaged or defective, and of the same quality and manufacture as products provided in the Work.
    - .2 If requested, furnish evidence as to type, source and quality of Products provided.
    - .3 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.

- .7 Delivery, Storage, And Handling
  - .1 Deliver all materials required as maintenance materials, spare parts or special tools, to the site, include shipping costs, and store as directed.
  - .2 Store spare parts, maintenance materials and special tools in a manner to prevent damage, or deterioration.
  - .3 Store in original and undamaged containers with manufacturer's seals or labels intact.
  - .4 Store materials subject to damage from severe climatic changes in a climate-controlled, weatherproof enclosure.
  - .5 Store paints and freezable materials in a moderately heated and ventilated room.
- 7 WARRANTIES AND BONDS
  - .1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.
  - .2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
  - .3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten (10) days after completion of the applicable item of work.
  - .4 Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial Performance is determined.
  - .5 Verify that documents are in proper form, contain full information, and are notarized. Co-execute submittals when required.
  - .6 Retain warranties and bonds for ~~two (2)~~ **one (1)** year of comprehensive material and labour warranty to be include for the entire project.

END OF SECTION