
1 OPERATION AND MAINTENANCE MANUAL

- .1 On completion of project, prepare for the Owner two (2) hard copies, and a .PDF copy, of an Operations Data and Maintenance Manual, made up as follows:
 - .1 Bind data in a vinyl hard covered, 3 ring loose leaf binder for 8-1/2" X 11" size paper.
 - .2 Enclose title sheet, labelled "Operation Data and Maintenance Manual", project name, date and list of contents.
 - .3 Organize the contents into applicable sections of work to parallel the project specification break-down. Mark each section by labelled tabs protected with celluloid covers fastened to hard paper dividing sheets.

- .2 The following information plus the data specified will be included:
 - .1 Maintenance instructions for finished surfaces and materials.
 - .2 Copies of hardware and paint schedules.
 - .3 Description, operation and maintenance instructions for equipment and systems, including a complete list of equipment and parts lists. Indicate the nameplate information such as make, size, capacity and serial number.
 - .4 Names and addresses of subcontractors and suppliers, including names and phone numbers of contact personnel and 24-hour emergency telephone contacts.
 - .5 Guarantees, warranties and bonds showing:
 - .1 The name and address of the project.
 - .2 Guarantee commencement date (date of Substantial Performance of the Contract as defined by the Construction Lien Act).
 - .3 Duration of guarantee.
 - .4 Clear indication of what is being guaranteed and what remedial action will be taken under the guarantee.
 - .5 Signature and seal of Contractor.
 - .6 Additional materials and products used in the project, listed under various Sections showing the names of the manufacturers and sources of supply.

- .3 The Contractor's Submittal
 - .1 Provide two (2) copies of the information and data. Each set shall be organized and presented in accordance with the requirements of 1.1 and 1.2 above.
 - .2 Operation Data and Maintenance Manuals are part of the Contract. Not less than \$ 15,000.00 will be held in a deficiency fund until all documents have been received and approved by the Consultant.
 - .3 Neatly type lists and notes. Use clear drawings, diagrams and manufacturers' literature.
 - .4 Include one complete set of final shop drawings (bound separately) indicating corrections and changes made during fabrication and installation.
 - .5 Include a complete set of warranties and maintenance service agreements.
 - .6 Include the requirements of all Divisions of the specifications in compiling the maintenance manuals.

2 WARRANTIES

- .1 Provide duplicate notarized copies of warranties called for in the applicable specifications Sections.
- .2 Refer to individual sections of the specifications for specific requirements of the warranties.

- .3 Execute and assemble transferable warranty documents from Subcontractors, suppliers, and manufacturers.
- .4 Provide a Table of Contents and assemble for inclusion in the Operation and Maintenance Manual specified herein.
- .5 Submit warranties immediately after the issuance of the Certificate of Substantial Completion, to facilitate release of holdback monies.
- .6 For items of work delayed beyond the date of Substantial Performance of the Work, provide an updated submittal within ten (10) days after acceptance, listing the date of acceptance as the start of the warranty period.
- .7 If the validity of an extended warranty is related to proper maintenance and servicing of equipment, etc., provide full details in maintenance manuals.

3 MAINTENANCE SERVICE

- .1 Furnish service and maintenance of components indicated in specification sections for the specified time period commencing on the date of Substantial Completion.
- .2 Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.
- .3 Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.
- .4 Maintenance service shall not be assigned or transferred to any agent or Subcontractor without the Owner's prior written consent.

4 AS-BUILT AND PROJECT RECORD DRAWINGS

- .1 As-Built Drawings:
 - .1 The Consultant will provide one set of blackline prints for recording as-built conditions.
 - .2 Maintain As-Built Drawings and record accurately significant deviations from the Contract Documents caused by site conditions and changes ordered by the Consultant.
 - .3 Mark changes in red ink.
 - .4 Where applicable, record the following information:
 - .1 Depths of various elements of foundations in relation to finish ground floor.
 - .2 Horizontal and vertical locations of underground utilities and appurtenances referenced to a permanent surface improvement.
 - .3 Locations of internal utilities and appurtenances concealed in the construction, referenced to visible and accessible features of the structure.
 - .4 Field changes of dimension and detail.
 - .5 Changes made by Change Order, Additional Instruction or order for minor change in the Work.
 - .5 Each Subcontractor shall provide the Contractor with the as-built information applicable to the

work of that subcontract.

- .2 Project Record Drawings:
 - .1 At the completion of the project and prior to final inspection submit the As-Built Drawings to the Consultant and the specialist sub-consultants for the production of Project Record Drawings by revising the electronic drawing files to incorporate the as-built information provided by the Contractor.
 - .2 The production of the As-Built Drawings is the responsibility of the Contractor.
- .3 The Contractor's Submittal: Project Record Drawings are part of the Contract. Not less than \$ 15,000.00 will be held in a deficiency fund until all documents have been satisfactorily completed and received by the Owner.

5 SPARE PARTS AND MAINTENANCE MATERIALS

- .1 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 materials and products provided in the Work.
 - .2 If requested, furnish evidence as to type, source and quality of products provided.
 - .3 Defective materials and products will be rejected, regardless of previous inspections. Replace materials and products at no additional cost to the Contract.
- .2 Transportation: Pay costs of transportation.
- .3 Storage, Handling and Protection:
 - .1 Store spare parts, maintenance materials and special tools in a manner which will prevent damage, or deterioration.
 - .2 Store in original and undamaged condition with the manufacturer's seals and labels intact.
 - .3 Store components subject to damage from weather in weatherproof enclosures.
 - .4 Store paints and freezable materials in a heated and ventilated room.
 - .5 Remove and replace damaged products at no additional cost to the Contract and to the Consultant's satisfaction.
- .4 Spare Parts:
 - .1 Provide spare parts in quantities specified in the individual specification Sections.
 - .2 Provide items of the same manufacture and quality as items in the Work.
 - .3 Deliver to the Project Site, place and store where directed by the Consultant.
 - .4 Receive and catalogue all items. Submit an inventory listing to the Consultant. Include the accepted listings in the Operation and Maintenance Manual.
 - .5 Obtain receipts for delivered products and submit receipts prior to final payment.
- .5 Maintenance Materials:
 - .1 Provide maintenance and extra materials in quantities specified in individual specification Sections.
 - .2 Provide items of same the manufacture and quality as items in the Work.
 - .3 Provide materials from the same production run as installed materials.
 - .4 Deliver to the Project Site, place and store where directed by the Consultant.
 - .5 Receive and catalogue all items. Submit an inventory listing to the Consultant. Include the

- approved listings in the Operation and Maintenance Manual.
- .6 Obtain receipts for delivered products and submit receipts prior to final payment.

.6 Special Tools:

- .1 Provide special tools in quantities specified in the individual specification Sections.
- .2 Provide items with tags identifying their function and the equipment with which they are associated.
- .3 Deliver to the Project Site, place and store where directed by the Consultant.
- .4 Receive and catalogue all items. Include the accepted listings in the Operation and Maintenance Manual specified herein.

6 DEFICIENCY HOLDBACK

- .1 The submission of the specified operation and maintenance manual, record drawings, warranties and other Contract closeout documents is a requirement of the Contract and failure to submit any item to the satisfaction of the Consultant will be deemed to be a deficiency under the Contract. Accordingly, the Owner will withhold on account from payments due to the Contractor, 2% of the current billing amount and not less than \$15,000.00 aggregate total. The purpose of this provision is to ensure that Contract closeout documents are accurately and properly prepared and submitted.
- .2 This holdback will be released upon receipt and review and acceptance by the Consultant of all required Contract closeout documents.

7 NOISE STUDY CERTIFICATION

- .1 The submission of a noise study is required for the Stationary Noise Sources (12 RTUs). The contractor is responsible for making sure that the overall sound level is not more than the values indicated in the Noise Impact study Report SACL #SW19541, as prepared by Swallow Acoustics. Receptor locations used for measurement should follow the recommendations of the Swallow Acoustic's Report.

8 TOPOGRAPHIC SURVEY

- .1 The Contractor shall employ a qualified Ontario Land Surveyor who will produce an as-built survey and assume for the Contractor the responsibility for their accuracy and well-being and by such procedure will absolve the Architect and Owner from any costs whatsoever to rectify from any cause. He survey should record any variations in the built project which differ from the original contract documents.
- .2 The surveyor shall verify the known Geodetic elevation and transfer that elevation to a sufficient number of bench marks or permanent monuments on the site to minimize any inaccuracy of long range shooting. He will correlate such Geodetic elevation with the elevations in use by all public utilities within the area and particularly adjacent to the project.

END OF SECTION