1.0 **GENERAL**

1.1 **PURPOSE**

.1 To guide those responsible for the design, construction and commissioning of building systems in the preparation and delivery of operating and maintenance (O&M) documentation that:

.1 is simple to prepare and update

.2 is delivered on time

.3 is easy to use, and

.4 provides accurate and relevant information

.5 The information contained in this section is applicable to all major divisions within the project scope of work: Architectural, Mechanical, Electrical, Communications, and Security.

1.2 **GENERAL**

.1 All information within operation and maintenance manual to be written in Canadian English.

.2 Provide SFU Facilities with 3 hard copies of operation and maintenance data in separate hard post expandable binders.

.1 Binders shall be ‘hard-post, expandable’ type with embossed cover and spine, available from Vancouver Bookbinding or equivalent. Vinyl binders are unacceptable.

.2 Binders to be 2/3 maximum full.

.3 Provide index to full volume in each binder.

.4 Identify contents of each manual on cover and spine.

.3 Provide table of contents in each manual. Assemble each manual to conform to Table of Contents with tab sheets placed before instructions covering subject.

.4 Provide SFU Facilities with a soft copy version in a labeled USB storage device or similar. The operation and maintenance data should be in the form of a booked marked and searchable PDF. Scanned copies of documents are not permitted, unless only hard copies were issued – and in such cases should be scanned, straightened/aligned and formatted with text recognition software to facilitate searching.

.5 Furnish one complete set of hard and soft copies in Draft format 6 weeks prior to substantial completion. Furnish the remainder upon Project Turn-Over.

.6 Operation and Maintenance data must be reviewed by consultants, Commissioning Authority and then SFU Facilities.
.7 Major Sections

1. System Description
2. Maintenance Schedule
3. Spare Part Inventory
4. Equipment Suppliers
5. Guarantees, Warranties and Bonds
6. Permits, Licenses, Test and Certificates
7. Product Data
8. Record Drawings and Specifications
9. Commissioning and Balance Report

1.3 System Description

.1 Building overview including occupancy, function, location and brief description should be included

.2 All mechanical and electrical systems will be described from a top down approach (describe major systems first, then the individual subsystems at the zone level).

.3 A brief description should be provided describing the operation and controls of major mechanical and electrical equipment.

1.4 Maintenance Schedule

.1 Provide maintenance schedule detailing regular maintenance intervals for building envelope, finished surfaces, as well as equipment.

.2 Schedule should be divided to capture major and minor intervals with different scopes and instructions of maintenance.

.3 Key pieces of equipment which are to be captured include fan and motor bearing lubrication, belt schedule and air filter schedule.

1.5 Spare Part Inventory

.1 Provide an inventory list of spare parts and specials tools identical to those installed, manufactured by original equipment manufacturer. Typical parts in this inventory include belts, pulleys, bearings, filters and fuse types. Paint formulas should also be included in this section.

.2 Indicate on inventory whether spare parts and special tools are on hand or not (supplied as part of project or not).

.3 Indicate where spare parts are currently stored if they are on hand.
.4 Identify spare parts by the following:
  .1 Include proper naming and part numbers wherever applicable.
  .2 Include system and piece of equipment to which part belongs.
  .3 Include location and room number where spare parts are associated to (location of equipment and systems).
  .5 Provide maintenance materials identical to those installed.

1.6 Equipment Suppliers
  .1 Provided organized list of company, name of contact, phone numbers and email addresses of all subcontractors and suppliers. Additionally, the contact information for local support of each company should be listed.
  .2 Indicate systems and materials for which the subcontractor/ suppliers are responsible for.

1.7 Guarantees, Warranties and Bonds
  .1 All items should be indexed properly for easy access.
  .2 Guarantee, Warranties and Bonds documentation should indicate the following:
    .1 Name and address of project.
    .2 Warranty/Guarantee/Bond commencement date and duration.
    .3 Clear indication of what is being guaranteed and what remedial action will be taken under guarantee.
    .4 List subcontractor, supplier, and manufacturer with name, address and telephone number of responsible principal.
    .5 Documents are to be in proper form, contain full information, and notarized where applicable.
    .6 Signature and seal of Trade Contractor.
    .7 For warranties, instructions should be provided on how to make warranty claims.

1.8 Permits, Licenses, Tests and Certificates
  .1 Tests and certificate documentation should be coordinated with Commissioning Authority wherever possible.
  .2 All items should be indexed properly for easy access.
Tests and Certificates documentation should indicate the following:

1. Applicable system or equipment.
2. Date testing or certification occurred.
3. Indication of result of test and/or achievement of certification.
4. Signature and seal of applicable parties.

The first certificate in this section must be the Substantial Completion Certificate.

1.9 Product Data

1. As-Installed Product Data

1. Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
2. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
3. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
4. If possible, a Change Order proposal should include resubmitting updated Product Data. This eliminates the need to mark up the previous submittal.
5. Note related Change Orders, Record Specifications, and Record Drawings where applicable.
6. Include manufacturer operation and maintenance data wherever possible.

2. Materials and Finishes

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.

3. Record Shop Drawings

1. Provide two copies of final reviewed set of Shop drawings.
1.10 Record Drawings and Specifications

.1 Record drawings and specifications are to be included as part of the Operation and Maintenance Data in digital format only. Hard copy is not required.

.2 A drawing schedule is to be provided at the beginning of the documentation.

.3 A valve tag schedule is to be included in this section with key information such as valve number, system, flow, type and size.

.4 When applicable, include a labeling and identification schedule for pipe identification (symbol, color), as well as ceiling access (symbol, color).

1.11 Commissioning and Balance Report

.1 Commissioning and Balance Report are to be included as part of the Operation and Maintenance Data.

1.12 Standard Operating Procedures

.1 Standard Operating Procedures (SOP’s) are to be included as part of the Operation and Maintenance Data.