

APPENDIX 2K

ASSET MANAGEMENT REQUIREMENTS

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1. DEFINITIONS

In this Appendix, in addition to the definitions set out in Schedule 1 [Definitions and Interpretation] to this Agreement:

“Asset Management” means a systemic approach to maintaining condition, value, life and usability of assets within a facility to achieve the financial and operational goals of the organization.

“Asset Description” means a descriptive name used in the Authority’s Computerized Maintenance Management System (CMMS) to describe each asset.

“Asset Number” means an identification number that uniquely identifies the asset/equipment in the Authority’s CMMS system. These numbers are provided by the Authority.

“Asset Name” means a structured, short form alpha-numeric identifier that typically includes an acronym for the specific equipment type and sequential numbering. These names are to be in accordance with standards provided by the Authority.

“Asset Tag” means a physical nameplate attached to the equipment with specified information on it to identify the asset.

“Asset Label” means a stick-on label with a designated number and affixed to the equipment.

“Facilities Manual” means the collective documents including content as described in Attachment 1 and generally including the following:

- (a) Operating & Maintenance Manuals
- (b) Service Manuals
- (c) Diagrams, drawings and exploded views
- (d) Standard Operating Procedures Manuals
- (e) Systems Manuals
- (f) OEM Maintenance Manuals

“Maximo” means the name of the Computer Maintenance Management System (CMMS) software used by the Authority’s Facilities Maintenance and Operations (FMO) team.

“Related Submittals” means submissions contained elsewhere in the Agreement that are identical or similar to the ones required in this Appendix and are for essentially the same purpose.

2. GOALS

2.1 Intent

These Asset Management Requirements are intended to provide the necessary resources to the Authority to effectively and efficiently manage, maintain and operate the Facilities in addition to ensuring all assets are tracked and managed over their lifetime to minimize risk and costs while maximizing reliability, efficiency, utility and value to the Authority.

2.2 Purpose

These requirements outline the Asset Management related deliverables and requirements in a consolidated, structured basis and work in conjunction with other requirements outlined elsewhere in the Agreement.

These requirements ensure Project Co coordinates and organizes in a consistent manner all requirements to support the management of the Facilities and related assets.

3. GENERAL REQUIREMENTS

3.1 Submittals

In all cases, where a submission or deliverable is identified, provide in accordance with the submission schedule identified in Section 4 (Submittals) of this Appendix.

3.2 Other Standards

When complying with these requirements, also ensure that the submissions comply with the following standards and guidelines.

- (a) CSA Z8001 – Commissioning of Health Care Facilities
- (b) CSA Z8002 – Operation and Maintenance of Health Care Facilities
- (c) ASHRAE Guideline 4 Preparation of Operating and Maintenance Documentation for Building Systems
- (d) LEED v4 Systems Manual requirements

3.3 Coordination of Requirements

- (a) All Related Submittals are to be coordinated with the requirements contained in this Appendix.
- (b) For the purposes of LEED Gold Certification submission of a 'Systems Manual', the Submittals identified here are also to be structured and named in accordance with and to meet the requirements for LEED Gold Certification. Any supplementary material and content or reworking of Submittals as required to meet the LEED Gold Certification submission requirements shall be added as necessary.

4. SUBMITTALS

4.1 Submittal Procedures

- (a) All Submittals are submitted in accordance with Appendix 2C (User Consultation and Review Procedure).
- (b) Asset Management Submittals required in this Appendix are to be separately submitted from the Design and Construction Submittals and Project Co will manage these submissions separately, working with designated personnel from the Authority's Facilities Maintenance and Operation (FMO) team.

4.2 Submittal Coordination plan

Project Co will deliver a coordination plan for delivery of all Asset Management requirements including how the digital and hardcopy deliverables will be coordinated and consolidated to incorporate subsequent project phases in a comprehensive, organized manner.

4.3 Submittal Formats

In all cases, a Submittal list is required in electronic format listing all documents, file names and contents of each submission.

(a) Electronic Formats

- (1) Every Submittal provided by Project Co to the Authority which is developed or created by Project Co is to be provided in the original standard editable formats and in digitally created TruePDF files. These files shall not be secured or locked and must be editable and printable by the Authority.
- (2) Every Submittal provided by a third party and not developed or created specifically for the Project (such as original equipment manuals from the manufacturer) are to be provided in editable format where available and in PDF files.
- (3) All digital Submittals are to be organized within logical folder structures with folder names that reflect the contents of the folder. All digital files are to be named such that the contents are readily identified from the file name. Project Co shall provide the Authority with a naming convention plan for review and approval prior to submission.
- (4) All digital files are to be provided on USB drives.

(b) Hard copy Formats

A sample of the binding and the format (i.e. organization, numbering, sections, etc.) shall be provided in advance as a sample for Authority approval prior to the final submission.

- (1) Submittals that are primarily data information (excel lists such as listing of spare parts or consumables) or are entered into BIM databases, do not require a hardcopy format unless explicitly identified in the requirement.
- (2) Submittals that are primarily standard document size such as operating manuals, system manuals, reports, etc. require the following:
 - A. Included drawings shall be minimum 11" x 17" format (fold out) to ensure usability and readability while all other content shall be standard 8 1/2" x 11" letter size paper in portrait orientation. Supplemental drawings are to be provided separately as required for readability and usability.
 - B. Draft and initial Submittals: Two or more hard copies in draft format based on request from the Authority to enable review and comment. These do not need to be bound in final format however shall be in a format that is convenient and readily reviewable.
 - C. Final Submittals: Three hard copies in final bound format within expandable hinge lock type binders with embossed lettering on the front

and spine with the document name and related information identified. A table of content page(s) is required, and tabbed pages shall separate sections within the document. The binders should be the same or equivalent to those available at Ringbinder.com.

- (3) Submittals that are primarily drawings in nature such as CAD drawings, floor plans, site plans, equipment plans, line diagrams, etc. require the following:
- A. All submissions : Three hard copies in full size large format organized and bound. Architectural and design drawings are to be provided in ARCH D format (24" x 36")

4.4 Submittal Schedule

Section Reference	Submittal Document	Submittal Deadlines	Expectations
4.2	Submittal Coordination Plan	Draft: 180 days prior to Target New Tower Substantial Completion Date	Outline level plan with all topics and issues listed along with estimated timelines
		Final: 90 days prior to Target New Tower Substantial Completion Date	Detailed plan with topics and issues fully completed with final, agreed timelines.
5	Handover Plan	Draft: 180 days prior to Target New Tower Substantial Completion Date	Outline level plan with all topics and issues listed along with estimated timelines.
		Final: 90 days prior to Target New Tower Substantial Completion Date	Detailed plan with topics and issues fully completed with final, agreed timelines.
6	Life Cycle Plan	Draft: 180 days prior to Target New Tower Substantial Completion Date	Template with several sample entries in multiple Major Group elements with sample Group and Individual elements.
		Final: 30 days prior to Target New Tower Substantial Completion Date	Completed plan based on approved template/samples.
7	Services Procurement Information	Draft: 180 days prior to Target New Tower Substantial Completion Date	Sample of submissions (draft information from this project or a sample from another project.
		Final: At each of New Tower Substantial	Completed information based on the most current information and

Section Reference	Submittal Document	Submittal Deadlines	Expectations
		Completion and SFB Expansion Substantial Completion	the approved format.
8	Spare Parts & Materials Inventory	Draft: 180 days prior to each relevant Target Substantial Completion Date	Sample template with sample information.
		Final: At each relevant Substantial Completion Date	Completed inventory based on final requirements.
10	Warranties	Draft: 180 days prior to each relevant Target Substantial Completion Date	Sample listing template
		Final: At each relevant Substantial Completion Date	Completed information based on final warranty information in approved format.
11	Facilities Manual	Draft: 180 days prior to each relevant Target Substantial Completion Date AND 90 days Prior to each relevant Target Substantial Completion Date	A sample template with table of contents, sample content and details about format and structure of each separate item to be provided.
		Final: At each of New Tower Substantial Completion and SFB Expansion Substantial Completion	Complete information based on final as-built and approved format. Any changes between this Final submission and Total Completion shall be made by Project Co to the submission as an update.
12	Asset Identification and Labelling	Draft: With 100% Design and Construction Documents (or minimum 30 days prior to estimated first instance of installation of identification and labels).	Sample of the Asset Tag and Asset Label provided for approval along with recommended placement examples on a variety of equipment types.
		Final: At each relevant Substantial Completion Date	All assets to be labelled based on requirements and approved samples.

Section Reference	Submittal Document	Submittal Deadlines	Expectations
13	360 Photos	Draft: with 100% Design and Construction Documents and after first application in this project.	Sample 360 photos from another project along with a plan for conducting the 360 photos. Subsequently, the first 360 Photos from this project for review.
		Final: At each relevant Substantial Completion Date	Completed 360 Photos based on approved sample and plan.

5. HANDOVER PLAN

- (a) Project Co will provide a plan for handover of the Facilities to the Authority, including final coordination meetings prior to handover. Include the following:
- (1) Ongoing coordination meetings, structure, timing, participants, etc.
 - (2) Utilities and interim services.
 - (3) Training.
 - (4) Keys, access controls, system usernames, passwords, etc.
 - (5) Receipt and review of final Submittals.
 - (6) Final handover meeting.

6. LIFE CYCLE PLAN

The lifecycle plan is intended to help the Authority in its long range planning and budgeting processes for refurbishment and replacement requirements. This initial plan from Project Co. based on the constructed elements will be updated and managed by the Authority going forward.

- (a) Project Co will provide a life cycle plan that identifies the timeline and anticipated cost for replacement or refurbishment of relevant building elements and systems, covering a 30-year period starting at each relevant Substantial Completion Date using Uniformat II level 1 and 2 at a minimum with level 3 where applicable.
- (b) Provide a preliminary plan based on the Design with subsequent updates based on as-builts and installed equipment. The final plan shall reflect the final as-builts.
- (c) The costs used in the life cycle plan shall reflect current year un-inflated costs.
- (d) Provide the plan in Excel format using the template **BH – Lifecycle Plan Template.xlsx** provided in the data room for the RFP.

- (d) Maintenance
 - (1) Provide a listing in electronic format of all contractors, suppliers and manufacturers used for supply and/or installation of systems, equipment, fixtures and architectural elements such as roofing, doors, windows, flooring, ceiling, etc.

8. SPARE PARTS AND MATERIALS INVENTORY

In addition to and collectively with any requirements for spare parts outlined in Schedule 3 [Design and Construction Specifications], Project Co shall also deliver these requirements.

8.1 Recommended Spare Parts Listing

- (a) Based on a risk assessment, provide a prioritized listing of recommended spare parts in an Excel file that should be retained on-site. All spare parts must be linked to the Asset Number of the related equipment.
- (b) Include specifications for the spare parts and include vendors in the list or on an attachment with reference to the list.
- (c) Identify on the list where spare parts have been provided by Project Co, in accordance with spare parts that a knowledgeable and experienced hospital operator would expect to have on site in accordance with Good Industry Practice, along with the quantity provided and the location where they are stored.
- (d) Provide a draft / template for review and acceptance by the Authority and then subsequently a final version based on a final risk assessment and the final installed equipment.

8.2 Recommended Consumables Listing

- (a) Based on the normal and typical consumables required for all installed systems and equipment, provide a consumable listing in an excel file with all consumables linked to the Asset Number of the related equipment where relevant as well as a reference to the related safety data sheets, which are to be provided in the Facilities Manual.
- (b) Include specifications for the consumables and include the vendors in the list or on an attachment with reference to the list.
- (c) Provide a draft / template for review and acceptance by the Authority and then subsequently a final version based on a final risk assessment and the final installed equipment.

9. SPECIAL TOOL OR MAINTENANCE EQUIPMENT

- (a) Provide the special tools required to conduct removal, installation, replacement or maintenance (for instance, tools for removal of ceiling panels). Where special tools require calibration, provide the calibration certificate.
- (b) Provide a listing of the special tools, where they are located on site, what they are used for and the instructions for use or alternately, point to a maintenance or service manual that contains the instructions.
- (c) Provide a list of special equipment that is required for providing maintenance services along with what they are used for.

- (d) Provide a draft / template for review and acceptance by the Authority and then subsequently a final version based on a final installed equipment.

10. WARRANTIES

10.1 Warranty Certificates

- (a) Provide all warranty certificates and related documentation required to validate warranty applicability. Submit hard copies in a binder with tabs separating warranties by system type (HVAC, electrical, plumbing, architectural, etc.).

10.2 Warranty list

- (a) Provide an electronic list (in excel) of all Tracked Assets and any other equipment, systems, fixtures and installed materials having a warranty along with the related warranty certification numbers, warranty time period and the warranty vendor name, address and contact information and brief description of warranty service (parts, service, both, etc.)

11. FACILITIES MANUAL

Project Co will provide a Facilities Manual comprising of a set of documents as outlined in Attachment 1 of this Appendix.

11.1 Purpose

- (a) The Facilities Manual ensures users and operators have the information necessary to properly operate and maintain the Facilities in a safe, efficient manner based on the original design intent.
- (b) The Facilities Manual also provides all necessary requirements to satisfy LEED v4 requirements for the Systems Manual.

11.2 Coordination

- (a) Project Co will coordinate with the Authority to confirm the desired structure and organization of the Facilities Manual through the Submittal review process and draft submissions.
- (b) Project Co will work with the Authority to incorporate the Authority's material where required.

11.3 Format and Structure

- (a) The Facilities Manual is a set of documentation. Some parts of the Facilities Manual are separately provided and separately bound however shall be referenced, indexed and introduced within the Facilities Manual.
- (b) Organize the Facilities Manual by major system category and sub-system where relevant.

12. ASSET IDENTIFICATION AND LABELLING

Each Tracked Asset is to have an Asset Number, Asset Name and Asset Description assigned to it.

Project Co shall use the asset naming structure provided in Section 5 of Appendix 2B [BIM Requirements] to ensure consistency in naming conventions for maintained assets.

12.1 Asset Number

- (a) Each Tracked Asset shall have an Asset Number, which will be entered into the BIM database for that asset.
- (b) The Asset Number will be unique for each asset and available numbers will be provided by the Authority to ensure they are unique with respect to the Authority's existing asset inventory contained within Maximo.

12.2 Asset Name

- (a) Each Tracked Asset shall have an Asset Name which is a short form alpha-numeric identifier that typically includes an acronym for the specific equipment type and sequential numbering in accordance with standards provided by the Authority.
- (b) Asset Names for the SFB Expansion shall follow the naming conventions for existing assets and shall not conflict with existing names.

12.3 Asset Description

- (a) Each Tracked Asset shall have a description which helps identify the asset as per the requirements of the BIM database for that asset.

12.4 Asset Tag

- (a) Each Tracked Asset shall have a physical plate affixed to it which contains information about the equipment as defined below.
- (b) The Asset Tag shall be affixed in an accessible and visible location. The location should be standardized for each type of asset as much as possible to make it easy to find the Asset Tag.
- (c) The Asset Tag shall have the information engraved on it in accordance with the requirements provided by the Authority. This includes the Asset Name and Asset Number as a minimum with other pertinent information (e.g., source of power, equipment controlled, voltage, primary and secondary voltages, etc.) as applicable and where space permits.
- (d) The Asset Tag shall meet the following characteristics for durability and readability:
 - (1) 3 mm (1/8") thick laminated plastic plates with white, engraved lettering mechanically attached with high bond adhesive.
 - (2) Colour scheme for electrical equipment can be found in the "Electrical Labelling Schema"; colour scheme for " tab in the attached excel document; colours for other asset types to be determined by the Authority prior to creating the Asset Tags.
 - (3) Asset Tags are to include a blank space 2.0 in x 1.0 in 35mm high and 60mm wide below the Nameplate information where the Equipment Label will be affixed, where space permits.
 - (4) UV resistant.

12.5 Asset Label

- (a) Each Tracked Asset shall have a label affixed in an accessible and visible location, preferably in a blank space on the Asset Tag where space permits.
- (b) The label shall meet the following characteristics for durability and readability:
 - (1) Size: 2.0 in x 1.0 in
 - (2) Substrate: 3-mil Flexible Anodized Aluminum Foil
 - (3) UV resistant
 - (4) Text Color: Black
- (c) The label shall contain the following information:
 - (1) Line #1: Property of
 - (2) Line #2: Fraser Health
 - (3) Line #3: Return if Found
 - (4) Barcode of Asset Number (in Code 39)
 - (5) Asset Number
 - (6) Logo: placed in top left corner
- (d) A sample Asset Label is shown below. The Authority will provide the logo file.



13. 360 PHOTOS

Project Co will utilize 360 camera technology and cloud software in addition to the photo documentation service set out in Section 6.18 (Photographic Documentation of Construction) of Schedule 2 [Design and Construction Protocols].

- (a) Project Co will provide cloud software licencing (HoloBuilder or approved equal) to store and organize 360 photos for sharing with the Authority. Project Co will ensure that the Authority has a licence to the cloud software both during the Term and following the Expiry Date.
- (b) The following 360 photographs will be provided to Authority:
 - (1) Building systems and equipment:

- A. Rough-in Images prior to enclosing behind walls, ceilings and floors.
- (2) Interior views
 - A. Final finishes including images of product labels if available.
- (c) Provide a draft schedule of 360 photo shooting timeline by building systems, equipment and areas for review and acceptance by the Authority and then subsequently a final version.

ATTACHMENT 1

Facilities Manual Content Requirements

This attachment outlines the minimum required contents for the Facilities Manual to be developed and submitted by Project Co.

Refer to the Submittal requirements and the formatting requirements within this Appendix for additional information.

1. INTRODUCTION AND EXECUTIVE SUMMARY

2. FACILITY OPERATIONS

- (a) Basis of Design - Updated as needed to reflect as-built conditions
- (b) Systems Descriptions
 - (i) Provide general description of the type of system, how it operates and how it interacts with other systems.
 - (ii) Provide details of system type, composition, areas served, location in building, design criteria and function of major components. All equipment arranged to operate together as one system shall be considered part of that system description. This should be organized system by system rather than by contract. Design criteria shall, at minimum, include following:
 - 1 Outdoor ambient conditions.
 - 2 Air changes per hour (by room as necessary)
 - 3 Exhaust air rate.
 - 4 Minimum outside air.
 - 5 Minimum lighting level
 - 6 Building pressurization and room pressurization
 - 7 Hydraulic performance e.g. pump's rated head and flowrate.
 - 8 Future load allowances.
 - 9 Standby capabilities.
 - 10 Calculated load and design capacity of domestic water supply mains.
 - 11 Calculated load and design capacity of drainage mains.
- (c) Sequences of Operation
 - (i) For all systems, providing information on how the systems are designed to operate in detail including controls, set points, seasonal changes, doors operation for secured areas, etc.

- (ii) Provide in a context, language and nature suitable for ongoing operational use by facility personnel.
- (iii) Include Standard Operating Procedures (SOP's) for start-up, shutdown and seasonal change over of each system component. Include following:
 - 1 Exact type and specific location of each switch and device to be used in system operation.
 - 2 Identify safety devices and interlocks that must be satisfied in order for equipment to start.
 - 3 List conditions to be fulfilled before attempting equipment start up, i.e. Valves position correct, glycol mixture concentration proper, piping filled with fluid, filters/strainers in place, etc.
- (d) Building Occupancy and Equipment Runtime Schedules
- (e) HVAC Setpoints
 - (i) Include Design conditions, Requirements for Minimum Outside Air, Seasonal changes in Operational Schedules or Setpoints

3. CONTROLS SOFTWARE

- (a) Provide a System Introduction for all controls software, including:
 - (i) A brief description of overall control philosophy.
 - (ii) Hardware interlocks with other equipment that may affect or override
 - (iii) Action of software control modules.
 - (iv) Alarms.
- (b) Provide procedure for operating staff to interface with software control modules
 - (i) How to override system or component operation, to adjust system or building control set points, etc. Name virtual points provided in software for this purpose and recommend adjustment increments and limits where applicable.
- (c) Provide a System Schematic indicating locations, point mnemonics.
- (d) Provide proper names of physical control points in system. Include RCU panel wiring diagrams with field point termination addresses.
- (e) Software Modules:
 - (i) For each module provide a description of purpose and logic of module.
 - (ii) Provide a description of each software Input and Output Variable.
 - (iii) Provide a hard copy listing of software module.

4. FACILITY DOCUMENTATION

- (a) As-Built Drawings and Specifications
- (b) Single Line Diagrams and Schematics
- (c) Commissioning and TAB Reports
- (d) Maintenance Contractor Reports
- (e) Reports and Studies
 - (i) Authority inspection reports, balancing reports, acoustic reports, calibration, certifications, pressure tests, performance tests, etc.
- (f) Warranty List
- (g) List of Equipment Suppliers and Contractors
- (h) O&M / Site Events Log
- (i) Safety Data Sheets

5. OPERATION AND MAINTENANCE

- (a) OEM Maintenance Manuals
 - (i) Where standard manuals are provided by manufacturers and vendors, the format shall be in accordance with their standard documents.
 - (ii) Where modified or custom maintenance manuals are developed for this project, these are to be provided in accordance with the Submittal Format identified above.
 - (iii) Provide all equipment datasheets, including performance curves and optimum ranges. Generic catalog shall be marked-up to specifically indicate the selected product, size, specification, operating point on the curve, and options.
- (b) Preventive Maintenance Plan

6. COMMISSIONING DURING OPERATIONAL PERIOD

- (a) Ongoing Commissioning Plan
- (b) Periodic Cx Requirements
- (c) Recommended Schedule for Recommissioning
- (d) Recommended Schedule for Recalibration of Sensors and Actuators

7. TRAINING

- (a) Training Plan delivered

- (b) Training material (those in addition to the standard documentation outlined elsewhere in this attachment)
- (c) Plan for Ongoing Training

8. REVISIONS

- (a) Plan for Updates to Manuals