

4.4 Commissioning, Handover and Warranty

4.4.1 Building Commissioning and Manuals

The Building Commissioning formalizes the review and integration of all project expectations during the planning and design, construction, testing/verification and turnover/occupancy phases through inspection and functional performance testing, as well as the oversight of operator training and record documentation.

Building Commissioning is an all-inclusive, quality-oriented process for achieving, verifying, validating and documenting (for both new and upgrade/retrofit construction) that the performance of facilities, systems, and assemblies meets defined objectives and criteria in order to achieve the design requirements. For new construction, it includes all the subsystems such as heating, ventilating and air conditioning (HVAC), plumbing, electrical, fire/life safety, building envelopes, interior systems (e.g., laboratory units), cogeneration, utility plants, sustainable systems, lighting, wastewater, controls, and building security. INFRA may undertake different levels of Building Commissioning detail depending on the size, uniqueness and complexity of the project.

Building Commissioning can also enable higher energy efficiency, environmental health and occupant safety, and improve indoor air quality by ensuring that the building components are working correctly and that the plans are implemented with the greatest efficiency.

INFRA generally retains an independent commissioning authority (CA) to organize, direct and review the commissioning activities for the project. INFRA implements Building Commissioning plans during the planning, design, construction, testing/verification, acceptance and warranty phases of a capital project.

AHS (FM&E) participates in the planning, design, construction, testing/verification, acceptance and warranty processes to acquire information that is necessary to facilitate facility turnover, as well as the ongoing operation and maintenance of building systems. The information acquired relating to the building and new systems is essential for the initial safe operation of the site and the ongoing efficient operation of the building throughout its life cycle. In addition, feedback that FM&E provides through the life cycle of the project supports

the development of facilities that take into account maintenance and operations considerations, and minimize the likelihood of costly changes later.

The Contractor is contractually responsible for developing operation and maintenance (O&M) manuals as part of the construction close-out process. The commissioning agent/team and the design team in turn review the manuals for clarity, adequacy of information and accuracy. The manuals provide a guide to the ongoing operation and maintenance of the building systems and are the basis of ongoing training for FM&E operational staff.

Roles and Responsibilities

The Project Manager is responsible for managing the Building Commissioning, including:

- engaging an independent CA as early as possible in the design process, often at the end of schematic design;
- establishing a commissioning team, consisting of the CA, Prime Consultant, sub-consultants, INFRA resources, Contractors and FM&E staff;
- overseeing the development of a commissioning plan, in collaboration with the commissioning team, design team, and FM&E personnel, following the completion of a schematic design report;
- with the assistance of the CA, ensuring the commissioning plan meets relevant standards, including LEED® basic commissioning and enhanced commissioning requirements;
- ensuring the development of manuals and the provision of training on building systems for FM&E operational staff prior to Facility Handover;
- ensuring the project documentation meets the commissioning and O&M manual requirements of INFRA (refer to [Alberta Infrastructure's Technical Resource Centre](#)) for additional information on commissioning and O&M manual policy and processes); and
- establishing an agreement for the funding of the FM&E commissioning resources.

FM&E is responsible for the following during the Building Commissioning:

- working closely with the independent CA as a member of the commissioning team;
- providing technical input to the Project Manager and consultants throughout the complete project cycle from design through warranty period;
- assisting in the development of a commissioning plan and test scripts that detail the extent of verification and testing of each building system and associated components;

- reviewing drawings and specifications during the design stage and providing comments to the Project Manager within a set period of time;
- working closely with the Clinical Liaison to keep each other informed and share a common understanding of the project;
- participating in regular site and milestone reviews coordinated with the Project Manager and the Contractor, and providing a list of deficiencies;
- participating in inspections during construction, where appropriate;
- assisting in the development of a validation plan to confirm energy efficiency modeling, system key performance measures (KPIs) targets, etc. as per the project/system original design and engineering requirements;
- assisting in LEED® measurement and verification planning, and managing and monitoring measurement and verification requirements throughout the year post occupancy;
- assisting and witnessing verification and testing of building systems and equipment;
- providing input and reviewing O&M Manuals;
- creating preventative maintenance schedules, preventative maintenance tasks and assist in identifying a critical spare parts inventory;
- attending FM&E O&M Training, including the coordination and scheduling of personnel for participation;
- supporting the development of training documentation for both operations and maintenance staff;
- reviewing record drawings from the contractor and consultants;
- ensuring new building systems and equipment are documented in AHS' Integrated Infrastructure Management System (e-Facilities); and
- working with the Project Manager and the CA to ensure all building systems have been successfully commissioned prior to handover of the project from the contractor.

AHS (CPSM F&E and IT) is responsible for the following during Building Commissioning:

- coordinating commissioning of major equipment and IT systems that link into building systems;
- coordinating commissioning of equipment (Vendor and Diagnostic Imaging (DI)) (See [Section 7.10](#)); and

In addition, AHS is responsible for acquiring final sign-off of installation and commissioning by regulatory agencies, such as: Authorized Radiation Protection Agencies (ARPA) and Canadian Nuclear Safety Commission (CNSC).

4.4.2 Facility Handover

Facility Handover means the legal transfer of a facility in terms of the title, authority, insurance and liabilities and as agreed to by both parties. The Project Manager and Clinical Liaison are jointly responsible for managing Facility Handover, in consultation with FM&E personnel.

Steps for Facility Handover

- At the design documentation stage, the Project Manager collaborates with FM&E personnel to clearly define the criteria/conditions to be met for Facility Handover. This information is included in the contract documents as appropriate;
- The criteria/conditions must specify the delineation of Prime Contractor responsibilities if the contractor and owner concurrently have Prime Contractor responsibilities over separate areas, and the extent of those responsibilities;
- The criteria/conditions will also specify details of holdbacks that may be applicable at Handover, and plans of dealing with any liens that may be in place;
- Approximately three months prior to the anticipated date of Facility Handover, the Project Manager will draft a Handover letter, outlining all the terms of the Handover. It will be submitted to AHS for review and comments, so that the terms of the Handover will be confirmed and agreed to prior to the effective date; and
- The Project Manager, in consultation with FM&E personnel, reviews the progress for adherence to the criteria/conditions at specific milestones, including Substantial Performance and Total Performance.

The Handover process could vary by project depending on the client needs, the project complexity and the need for a phased handover of the facility. See Handover letter template [Appendix 12.6](#) INFRA provides a copy of the handover letter to HEALTH.

4.4.3 Operational Commissioning and Move-in Planning

Operational Commissioning is led by AHS (with INFRA participating), and details the clinical and non-clinical operational and move-in requirements. Planning begins in the Functional Programming stage, when operational elements are identified, including operational costing estimates. As the capital project proceeds, the Operational Commissioning Plan is further

detailed and refined by AHS. Operational Commissioning may overlap with Building Commissioning as equipment is installed, and may even commence prior to Substantial Performance. It involves activities such as orientation of staff, training in units/work areas prior to move-in, dry runs, and testing of procedures/equipment.

Move-in planning refers to the specific details and schedule for moving staff and patients into a facility (possibly phased over a set period of time) in order to be fully operational.

AHS and INFRA are responsible for the following during Operational Commissioning and the planning and execution of the move-in:

Operational Commissioning – AHS’ Roles and Responsibilities

- Coordinating involvement of appropriate clinical and support groups, including sharing relevant supporting information;
- Planning for move-in and start-up by user group(s) to be consistent with an approved operational budget and organizational objectives set out in the Functional Program; and
- Developing operational commissioning plans to guide clinical and support groups as the new facility goes into clinical operation.

Operational Commissioning – INFRA’ Roles and Responsibilities

- Ensuring facility and all building systems (e.g. Heating, Ventilation, Air Conditioning (HVAC), controls, security) are commissioned;
- Facilitating the Building Commissioning, including integration tests;
- Facilitating the turnover of project record drawings and O&M manuals;
- Facilitating the prerequisites to obtain occupancy permit(s);
- Facilitating Substantial Performance and Handover;
- Communicating the schedule for completion of Building Commissioning and Handover (phased or one step depending on complexity of project);
- Addressing deficiencies as noted;
- Providing timely communications on changes to completion schedules; and
- Coordinating early site access as required for clinical commissioning.

Move-In Planning– AHS’ Role and Responsibilities

- Coordinating the delivery and installation of equipment;
- Commissioning of equipment and IT;
- Ensuring the opening of services is coordinated linking commissioning to other planning and operational initiatives occurring within AHS;

- Establishing move-in sequencing of staff and/or patients for a phased opening of a new facility together with sequenced shut-down of the facility being vacated so that each component is operational and ready for integration with the subsequent component to be moved; and
- Ensuring safety and clinical compliance for program moves with active patients.

While INFRA does not have a direct role in the move-in planning or execution, both AHS and INFRA will be jointly responsible for resolving unexpected findings or warranty issues following move-in.

4.4.4 Warranty Resolution

The warranty period starts at Substantial Performance unless stated otherwise in the warranty certificates. INFRA's Project Managers are responsible for managing the warranty resolution process. Warranty issues are identified and resolved either through an ongoing resolution process, or through a formal warranty evaluation process. These processes are described below.

Ongoing Warranty Resolution Process

This process may be streamlined under various circumstances with the agreement of both parties, particularly for items that are more routine in nature or otherwise straight forward. Also, in cases that are urgent, the parties may also agree, with prior authorization of the Project Manager, to have FM&E contact the contractor directly.

Warranty issues are identified and resolved as they arise during the warranty period. The FM&E Facility Manager identifies potential warranty issues and brings them to the attention of the Project Manager. The Project Manager evaluates each issue with the FM&E Facility Manager and the consultants to determine if it requires rectification by the Contractor. If it is a warranty issue, the Project Manager contacts the Contractor to discuss and arrange rectification.

The Project Manager, with the support of FM&E, meets with the Contractor to:

- describe the warranty issue;
- outline the expected outcomes of reconciliation;
- develop a timeline for reconciliation consistent with AHS' operational requirements; and
- inspect or review the reconciliation (i.e., was the work satisfactory or issue resolved?).

Formal Warranty Evaluation Process

Before the warranty period expires, the Project Manager initiates a formal warranty evaluation process as follows (see [Appendix 12.1](#) Contract Acceptance Procedures Flowchart for additional information):

- the Project Manager calls a meeting with the FM&E Facility Manager, Contractor and consultants (the Review Team) to bring forward and discuss any outstanding warranty issues;
- the Review Team conducts a site review to identify and verify warranty issues;
- The Prime Consultant compiles a final list of all warranty items requiring resolution, with input from FM&E, INFRA and the Prime Contractor, and forwards the list to the Project Manager for review;
- the Project Manager reviews the list of items with the team to set priorities considering criticality, timelines, client needs, and operational impacts; the Prime Contractor then drafts a work schedule based on the prioritized list of warranty items, for agreement with the Team;
- the Prime Contractor works with FM&E to obtain access, coordinate operational planning, and determine health, safety and IPC procedures to be employed during the rectification work;
- the Prime Contractor notifies INFRA when the work is complete;
- the Project Manager coordinates a review of the completed work; and
- the Project Manager issues a Letter of Total Performance to the Prime Contractor on confirmation by the Prime Consultant that all warranty items have been resolved, providing that all other project deficiencies and prerequisites to Total Performance have been achieved.

4.4.5 Reimbursement of Alberta Health Services Facilities Maintenance and Engineering Expenses

The processes and procedures surrounding the reimbursement of FM&E expenses are under review. In the interim the structure outlined below will be followed.

FM&E costs that AHS incurs as a direct result of construction may be reimbursed by INFRA provided the work and the associated costs have been pre-approved by the Project Manager. Reimbursement of expenses may be approved where work has occurred outside of normal working hours or if there was proof that AHS back filled the position with a casual employee

or contractor. Work associated with routine operations that do not create an incremental cost to AHS are not eligible for reimbursement.

To facilitate reimbursement, AHS will submit a summary of all labour costs (detailing name, location, work performed, hours worked and wage costs) and any material costs through an invoice to the project manager quarterly as a minimum. However, the Project Manager may request reporting from AHS on a monthly basis. The Project Manager reviews the AHS summary and authorizes reimbursement as appropriate.

The following work may be considered for reimbursement when approved by the Project Manager (for only those activities that would not otherwise be performed by the Contractor):

- labour for shut downs/system tie-ins;
- labour/material for construction assistance to contractor (e.g. emergency response and remediation due to floods and other unforeseen issues); and
- labour/material for temporary installations/decanting due to construction.

Examples of temporary installations and assistance that may occur as a direct result of construction include:

- locksmith – supplying keys and cylinders, rekeying construction areas, and planning of the keying strategy;
- electronics – assistance with automatic door operation;
- structural – hanging and modifying doors, construction of temporary stands, installation of safety mirrors or shelving, T-bar ceiling removal, the installation or dismantling of scaffolds, creating signage holders, painting and wall repairs;
- electrical – breaker installations, electrical circuit testing, receptacle relocations, power trend monitoring on transformers, creating tube system configuration diagrams and operation requirements, and switching order reviews;
- HVAC – building automation and alarm point setup / review, and programming changes to damper operation; and
- signage – creation of new signs, replacement of existing signs and creating labels.

AHS participates in commissioning activities prior to the handover of the facility as described in [section 4.4.1](#). A request for the reimbursement of expenses associated with the assignment of staff to the activities outlined in section 4.4.1 requires the prior-approval of the Project Manager. Work that does not create an incremental cost to AHS is not eligible for reimbursement.

AHS may request funding of staff on a yearly basis prior to the handover of a facility for the purpose of assisting INFRA with design reviews and commissioning activities. Such requests would normally apply to large or complex projects and may involve the partial or full-time assignment of FM&E personnel. To request funding support from the project, AHS prepares a submission to the Project Manager substantiating their request including a summary of the proposed personnel assignment(s), their duties or responsibilities, duration of assignment and costs (standard industry wages should be utilized unless otherwise approved by INFRA).

The Approval Process Form is in development