
Guide to Building Handover

Checklist Companion Documents for: Development Teams Owner/Operators



Guide to Building Handover

To avoid delay in collecting closeout documents from the trades, have them submitted at 75% completion of each trade's responsibilities. The contract documents should stipulate this requirement

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Guide to Building Handover

Background

As building technology increases in complexity and construction schedules become more compressed, building operators increasingly find they must pay greater attention in order to ensure adequate transfer of knowledge during building handover. The handover can be complex for all parties, and problems are likely to arise if building operators do not prepare.

To identify issues and improve the handover process, BC Housing consulted the Owner/Operators of 10 recently completed projects from various regions of the province about their experiences of the process for their buildings. Healthy discussions took place, and the groups looked at a number of areas of concern.

BC Housing has developed this *Guide to Building Handover* based on this input. These guidelines:

- Address the processes and requirements for ensuring a successful building handover from the General Contractor to the Owner/Operator
- Focus primarily on what information is required to ensure the smooth transfer of documentation for a successful building handover
- Introduce recommended best practices to simplify the handover process, ensuring minimal confusion when the General Contractor turns over the keys

We believe these guidelines will streamline the handover process and enable Owner/Operators to improve building operations.

How to Use This Guide

This *Guide to Building Handover* contains three parts: the schedule, checklists and companion documents. The checklists and companion documents describe the responsibilities of the Development Team and the Owner/Operator.

Schedule: Outlines the typical time frame of a project from the design phase to the one-year warranty review stage. This graphic highlights the key stages in the project, along with recommended starting points for specific tasks.

Checklists: Assist the teams with planning, coordinating and monitoring the tasks to ensure a successful transfer. The checklists have columns for responsible parties, due dates and comments. We encourage project teams to use or modify these checklists and to include them early in the design process to ensure all project team members understand their roles and responsibilities.

Companion document: Provides background information for the checklists and identifies which project team member is typically responsible for a specific task relating to the building handover.

Guide to Building Handover

Introduction

Projects funded by BC Housing rely on project teams: the Development Team and the Owner/Operator team. These teams are involved from project initiation, through design and construction, into day-to-day operation and maintenance.

The Development Team consists of the owner's representative, design and development consultants, and contractors involved in the physical construction of the building. The Owner/Operator team consists of Owner/Operator representatives and their staff members who are involved in operating and maintaining the building.

This document guides the Development Team in preparing to turn over the building and the Owner/Operator team in preparing to operate the building.

Definitions

Building Commissioning: The process of ensuring the building systems are operating as intended and Owner/Operators have the information and training they need. It is the Owner/Operator's way of making sure that the project's energy related systems are installed, calibrated and performing according to the project requirements. "A commissioned building provides optimized energy efficiency, indoor air quality, occupant comfort and sets the stage for reduced operation and maintenance costs." (LEED Canada-NC version 1.0) The level and depth of commissioning required will be determined by the size of the project and by the needs defined in the owner's project requirements. Systems to be commissioned throughout the building process, and in which operators should be trained, include:

- Lighting and Controls
- Life safety system (fire alarm, sprinklers, etc.)
- Air and water balancing
- HVAC systems
- Domestic hot water systems

For more detailed explanations of the commissioning process, including a definition of owner's project requirements, basis of design, a commissioning plan, etc., please see the *LEED Reference Package* (LEED Canada-NC version 1.0 and LEED 2009) and ASHRAE's *Commissioning Process Guideline* (ASHRAE 0-2005).

Building Handover: The turnover of the project from the General Contractor to the Owner/Operator

Development Team: The consultants, contractors, funding agencies and other parties involved in the design and construction of the project

Owner/Operator: BC Housing or the non-profit society responsible for the day-to-day operations of the project

Pre-handover: All critical activities and project requirements leading to completion, handover and occupancy

Checklist Companion Document

Development Team

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Checklist Companion Document:

Development Team

Design/Plan Sign-Off

Areas of Concern

- *Building operators do not feel adequately consulted prior to construction about their needs*
- *Project completion can be delayed by design changes made during construction*

Requirements and Responsible Parties

The Development Team's major objective during construction is to complete and hand over a project that has been designed to meet the Owner/Operator's requirements, complies with the contract documents and is completed on time.

Ensuring that all stakeholders have reviewed and approved the construction documents and the Prime Consultant has thoroughly reviewed the documents for completeness, accuracy and coordination will help prevent design changes during construction and ensure the completed building meets the Owner/Operator's requirements.

To accomplish this, the Development Team and the Owner/Operator should do the following:

All stakeholders:

- Undertake an integrated design review at various stages of project development (schematic, design development and working drawings) that involves all stakeholders, including the Owner/Operator, building operations and maintenance staff, funding agencies, construction managers and consultants, to ensure their needs and requirements are addressed in the construction documents

Prime Consultant:

- Review the design, working drawings and specifications to minimize or avoid errors and omissions and ensure full coordination of the construction contract documents across all design disciplines

Development Consultant/Project Manager:

- Include the integrated design review process and Prime Consultant's review process in the development schedule and ensure their implementation

Owner/Operator:

- Participate in all design and construction meetings
- Clearly and consistently communicate all design requirements
- Review and approve the construction documents prior to executing the contract

Timing Considerations

The integrated design review process and Prime Consultant's review process should occur early in the project to minimize errors and changes to the final construction documents.

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Checklist Companion Document:

Development Team

Off-Site Service and Utility Contracts

Areas of Concern:

- *Agreements for off-site services and permanent utility connections can be delayed, which can affect the project schedule*
- *The General Contractor must coordinate with off-site and utility service contractors regarding scope of work*

Requirements and Responsible Parties

The creation, review and registration of legal agreements concerning off-site services and utilities should be included early in the development schedule to ensure they are completed on time. These services involve the work of various contractors and utility providers, and their scopes and timelines will need to be carefully planned and coordinated. These services include:

- Water, sewer and storm drainage
- Landscaping
- Main lighting
- Electric power (BC Hydro)
- Natural gas (Fortis)
- Telephone (TELUS)
- Cable and data

Prime Consultant:

- Ensure the work of the utility providers and off-site service contractors is coordinated with the General Contractor's contract documents

Development Consultant/Project Manager:

- Prepare a project development schedule that includes review and execution of agreements for service and utility connections as well as the construction of these systems
- At the early design and funding-approval stages, initiate all agreements related to permanent utilities and off-site service connections with the city and utility providers

Owner/Operator:

- At the early design and funding-approval stages, review all agreements related to permanent utilities and off-site service connections with the city and utility providers. Establish and document the following:
 - Scope, cost and timelines
 - Contractual arrangements for design and construction or installation
 - Ongoing maintenance and repairs
 - Other related work that may affect installation or timing

Timing Considerations

Initiate consultation for off-site services and utilities at the early design stages to ensure that procurement of these services or the work of other parties will not affect the project schedule.

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Checklist Companion Document:

Development Team

Permanent Service and Utility Connections

Areas of Concern

- *Delay in completion of utility connections may affect the timetable*
- *The Owner/Operator and General Contractor must clarify who bears responsibility for payment of temporary utility bills at project handover*

Requirements and Responsible Parties

The completion and availability of permanent services and utility connections is an important milestone in the handover of a project. The Development Team and the Owner/Operator should ensure that all legal agreements have been executed and all work has been scheduled to meet the target occupancy date. The items under this section of the checklist should be incorporated by the Development Consultants/Project Managers and General Contractors into their respective project schedules.

Development Consultant/Project Manager:

- Assist the Owner/Operator in reviewing and executing agreements for service/utility connections
- Monitor progress and coordinate timelines with the General Contractor and the rest of the Development Team

General Contractor:

- Provide temporary connections for power, water and gas during construction
- Agree with the Owner/Operator regarding the turnover of utility bills for temporary services at project completion
- Construct and coordinate the on-time installation of permanent service and utility connections.

Owner/Operator:

- At the pre-construction stage, execute all agreements related to permanent utility and off-site service connections with the city and utility providers
- Agree with the General Contractor on the turnover of utility bills for temporary services at project completion

Timing Considerations

We recommend that the development schedule assume completion of all service and utility connections at least 30 days before substantial completion.

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Checklist Companion Document:

Development Team

Pre-Handover Meeting

Areas of Concern

- *The General Contractor and the Owner/Operator must coordinate on critical tasks prior to project completion*

Requirements and Responsible Parties

An early, focused review of the status of all critical activities and project requirements leading to completion and occupancy will help ensure a successful handover. At 60 days from the expected substantial completion date, a building pre-handover meeting should occur. Both the Development Team (Prime Consultant, General Contractor, Development Consultant/Project Manager, BC Housing Development Services staff) and the operations team (Owner/Operator and BC Housing Operations staff) should attend and review the status of the following:

Development Team

- Utility and service connections
- Commissioning activities
- Items on the occupancy permit application checklist
- Closeout documents:
 - o Operating and maintenance manuals
 - o As-built drawings
 - o Commissioning documents
- Development schedule

BC Housing Operations Staff Non-Profit Portfolio Manager

- Provide the Non-Profit Building & Unit Information Form (OPS-220) to Owner/Operator society to be filled out and entered into "Housing Connections" at BC Housing; units will be filled through the Housing/Supportive Housing Registry

Owner/Operator

- Owner/Operator requirements at handover
- Building systems training schedule
- Owner/Operator's maintenance and renovation plan
- Fill out the Non-Profit Building & Unit Information Form (OPS-220) and return it to the project's Non-Profit Portfolio Manager

We recommend that the outcomes from this meeting be monitored and tracked during regular construction meetings until the final handover.

Timing Considerations

The appropriate time to initiate and review the building handover requirements may vary. Early review of the tasks of both the construction team and the housing operator will ensure these activities occur on schedule. It is recommended to hold the pre-handover meeting approximately 60 days prior to substantial completion.

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Checklist Companion Document:

Development Team

Contract Closeout Requirements

Areas of Concern

- *Late or incomplete contract closeout submittals could delay the preparation of Operation and Maintenance manuals, as-built drawings and other documents the Owner/Operator needs*

Requirements and Responsible Parties

The construction contract documents specify the submittals and closeout documentation the General Contractor must submit at completion. Preparing submittals well in advance will ensure all closeout documents will be available to the Owner/Operator at building handover. Submittals and closeout documents include, but are not limited to, the following:

- All submittals called for in all divisions of the specifications, general conditions and supplementary general conditions
- O&M manuals
- As-built drawings
- WorkSafeBC certificate of good standing
- Statutory declaration
- Updated survey of work
- Keys
- Appliance warranties
- Photographic documentation
- Fire safety plan

Prime Consultant:

- Clarify and incorporate closeout requirements from all consultants, the Owner/Operator and BC Housing into the contract documents
- Review and approve submittals in accordance with the project schedule
- Assign an amount corresponding to the value of closeout submittals in the schedule of values for each trade
- Ensure that deficiency holdbacks at substantial completion consider the value of incomplete closeout documents

Development Consultant/Project Manager:

- Include the preparation, submission and review of closeout documentation in the project schedule and meeting agendas, and monitor compliance.

General Contractor:

- At the start of construction, prepare a log or schedule of submittals identifying the responsible parties and required dates for submission
- Report on the status of submittals at the regular site meetings
- Prepare and collect all required submittals and closeout documents and submit them to the Prime Consultant according to the schedule

Timing Considerations

To avoid delay in collecting closeout documents from the trades, have them submitted at 75% completion of each trade's responsibilities. The contract documents should stipulate this requirement.

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Checklist Companion Document:

Development Team

Operating and Maintenance Manuals

Areas of Concern

- *Operating and maintenance manuals (O&M manuals) may be submitted too late or may not contain all the information called for in the contract documents, which the Owner/Operator needs to operate and maintain their building.*

Requirements and Responsible Parties

It is the General Contractor's responsibility to prepare the O&M Manuals. Instructions in the manuals must be user-friendly to effectively guide the Owner/Operator in the proper operation and maintenance of building systems, materials, finishes, components and equipment.

Development Consultant/Project Manager:

- Plan and coordinate the activities of the General Contractor, Prime Consultant and Owner/Operator so complete O&M manuals are available at handover

Consultants (Prime Consultant and/or LEED commissioning authority):

- Review the General Contractor's draft table of contents and submit comments to the General Contractor within 15 calendar days
- Review the complete O&M manuals to ensure completeness and accuracy, and provide written comments to the General Contractor within 30 calendar days
- Ensure that an appropriate deficiency holdback is applied to the General Contractor's payment until approved O&M manuals have been submitted to the Owner/Operator

General Contractor:

- Engage experienced and qualified staff or consultants to prepare the O&M manuals
- Submit a draft table of contents at the pre-handover meeting (60 calendar days prior to expected substantial completion) for approval by the design consultants, Owner/Operator and commissioning authority
- Prepare the O&M manuals in accordance with the approved table of contents and submit the complete O&M manuals to the Prime Consultant and Owner/Operator with the application for substantial completion
- If the Prime Consultant or BC Housing notes any deficiencies in the O&M manuals, remedy deficiencies within 30 calendar days

Owner/Operator and BC Housing:

- Review the O&M manuals submitted by the General Contractor and inform the consultant if any information is missing, or clarification required, within 15 business days

Timing Considerations

The General Contractor should collect the documents to be included in the manuals as early as possible. We suggest that these be submitted by each trade subcontractor to the General Contractor no later than at 75% completion of that specific trade's responsibilities. This process should not wait until the end of the project.

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Development Team

As-Built Drawings

Areas of Concern

- *As-built drawings may not be submitted to the Owner/Operator in a timely manner*
- *Without as-built drawings at the time of handover, the Owner/Operator will not have the reference drawings they need to troubleshoot or resolve building issues*

Requirements and Responsible Parties

Upon completion, the General Contractor should employ the Prime Consultants to produce the General Contractor's as-built drawings. The General Contractor must submit to the Owner/Operator two copies of white prints and electronic PDF and CAD drawing files.

Prime Consultant:

- Review the accuracy and completeness of the as-built drawings prepared by the General Contractor and ensure these comply with the requirements of the contract
- Finalize the as-built drawings promptly to meet the General Contractor's obligation to the Owner/Operator

General Contractor:

- At 75% completion, coordinate with the Prime Consultant to initiate the preparation of the as-built drawings
- Submit complete as-built drawings to the Prime Consultant and BC Housing with the application for substantial completion
- Submit complete and approved as-built drawings to the Owner/Operator no later than 30 calendar days after substantial completion

Owner/Operator:

- Ensure that an appropriate dollar amount is held back from the progress billings until complete and approved as-built drawings have been received

Timing Considerations

In the contract documents, the Prime Consultant should specify a deadline for the General Contractor to submit approved as-built drawings to the Owner/Operator.

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Checklist Companion Document:

Development Team

Fire Safety Plan

Areas of Concern

- *Delay in the preparation and approval of the fire safety plan may delay issuance of the occupancy permit*
- *The fire safety plan may not meet the requirements of the fire marshal and/or the Owner/Operator*
- *Additional time may be needed to address specific requests that may involve code equivalencies*

Requirements and Responsible Parties

The fire safety plan should be part of the General Contractor's scope of work, unless the Owner/Operator specifically requires otherwise. A qualified consultant should be engaged to prepare a fire safety plan and other documents in accordance with the most recent edition of the British Columbia Fire Code or municipal by-laws.

Prime Consultant:

- Stay up-to-date on the local fire department's current design requirements and ensure these are reflected in the contract documents

General Contractor:

- At least 45 days before the target substantial completion date, submit the fire safety plan for review to the Owner/Operator and the consultant hired to prepare the plan

Owner/Operator:

- Review the fire safety plan with the fire safety consultant and ensure the plan, including evacuation and emergency procedures, is consistent with operational set-up

Timing Considerations

Early review of the fire safety plan will ensure that all consultant and Owner/Operator requirements are met and any delays from the approval process can be mitigated to meet the target completion date.

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Development Team

Training and Orientation

Areas of Concern

- *Proper training for building operators often does not occur, or is disorganized when it does occur*

Requirements and Responsible Parties

The Development Team and Commissioning Agent (if applicable) are responsible for training and providing an orientation to the Owner/Operator's maintenance staff. The training session should incorporate all building systems and should match the staff's level of expertise.

Commissioning Agent and/or General Contractor:

- Conduct a walkthrough for general Owner/Operator staff
- Lead a training session with the Owner/Operator's maintenance staff. Ensure the Owner/Operator's needs are met and questions are answered. Ensure all necessary sub-trades are present to assist with training. Answer questions as they arise
- Digitally record the training session if possible

Development Consultant/Project Manager:

- Coordinate the training session, ensuring all necessary parties are present

Timing Considerations

Training should take place before the building handover meeting but after substantial completion.

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Development Team

Commissioning

Areas of Concern

- *Building systems and interactions are often not adequately commissioned, leaving building operators to perform duties they are not equipped to handle*

Requirements and Responsible Parties

The Development Team and Commissioning Agent (if applicable) should begin the building commissioning process prior to occupancy, at or before substantial completion.

Commissioning Agent and/or General Contractor:

- Begin commissioning the building. Ensure all systems are performing to their manufacturer-specified standards and connections among systems are properly set up (including the direct digital control system, if applicable)

Development Consultant/Project Manager:

- Ensure that building commissioning is taking place before or at the same time as substantial completion. Confirm the final building handover meeting and training dates and topics

Timing Considerations

Building commissioning should begin before or at substantial completion.

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Checklist Companion Document:

Development Team

Substantial Completion

Areas of Concern

- *Project completion could be delayed if the work is not completed satisfactorily*
- *Deficiencies may not be remedied within the agreed-upon time frame*

Requirements and Responsible Parties

The construction contract is substantially complete when the Prime Consultant issues a certificate of completion, as defined by the *Builders Lien Act*, for the work as a whole, and the building is ready to use for the purpose intended.

Prime Consultant:

- Conduct deficiency inspections to determine if the General Contractor's application is valid and to assess the value of the deficiencies
- Prepare a deficiency list that incorporates all deficiencies noted by the project sub-consultants, Owner/Operator and BC Housing
- Carefully evaluate the cost of deficiencies to ensure the deficiency holdback is adequate to complete the remaining and deficient work to the satisfaction of the Prime Consultant and the Owner/Operator
- If the application is valid, issue the certificate of completion to the General Contractor and Owner/Operator no later than 10 calendar days from the General Contractor's application for substantial performance

General Contractor:

- Upon substantial performance of the work, submit a list and estimate of deficiencies to the Prime Consultant with the application for substantial performance
- Immediately following the issuance of the certificate of completion, establish a reasonable date for correcting deficiencies and inform the Owner/Operator in writing of the date

Owner/Operator:

- If a sample unit has been requested, inspect the completed sample unit in the presence of the Prime Consultant and the General Contractor to ensure the unit meets the agreed level of quality and finish
- Upon the General Contractor's request for certification of substantial performance, conduct inspections with the Prime Consultant and General Contractor to identify deficiencies

Timing Considerations

The Development Team should implement a quality-control process during construction to ensure the standard of work is met and deficiencies are quickly identified and corrected.

A sample unit, used to set a consistent standard for the fit and finish of the suites, is one tool for reducing deficiencies and facilitating completion. Such a requirement should be discussed when preparing the construction documents.

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Checklist Companion Document:

Development Team

Construction Deficiencies

Areas of Concern

- *The General Contractor may be delayed in correcting deficiencies after substantial completion*
- *Deficiencies may not be remedied to the Prime Consultant and Owner/Operator's satisfaction*

Requirements and Responsible Parties

After substantial completion, the General Contractor should correct all deficiencies identified by the Prime Consultant, the Owner/Operator and BC Housing.

Prime Consultant:

- Review and provide written sign-off on correction of deficiencies to confirm compliance with the contract documents
- Establish a deficiency holdback in the amount of *twice* the value of the deficiencies when certifying progress payment at substantial completion
- Avoid certifying partial release of the deficiency holdback, unless for seasonal deficiencies

Development Consultant/Project Manager:

- To avoid deficiencies from escalating as the project approaches completion, work with the Development Team to implement a quality-control process to ensure the standards called for in the contract are met and deficiencies are identified and corrected promptly

General Contractor:

- Correct the deficiencies to the satisfaction of the Prime Consultant and Owner/Operator, according to the agreed-upon schedule.

Owner/Operator:

- To differentiate General Contractor deficiencies from tenant or Owner/Operator damage, agree with the General Contractor on a process for addressing damage to the premises during Owner/Operator or tenant move-in
- Discuss the General Contractor's performance issues and appropriate action with BC Housing
- At the completion of the project, inform the bonding company of major issues regarding the General Contractor's performance

Timing Considerations

All deficiencies should be remedied before tenant move-in. We recommend the development schedule be planned to achieve this goal and that the General Contractor and sub-trades work together to meet this schedule.

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Checklist Companion Document:

Development Team

Occupancy Permit

Areas of Concern

- *Delay in issuing the occupancy permit could cause problems scheduling tenant move-in and meeting program targets, and could increase development costs and interest charges*

Requirements and Responsible Parties

The occupancy permit is issued when the municipality has deemed the building to be complete and ready to use for its intended purpose.

Obtaining the occupancy permit involves the work of numerous parties, including all the consultants, the General Contractor, subcontractors and authorities having jurisdiction over the project. This requires careful planning and coordination by the Development Team to enable the Owner/Operator to meet their target occupancy date.

Prime Consultant:

- At the construction kick-off meeting and subsequent regular site meetings, review the key activities and timelines leading to building occupancy and obtain consensus on the schedule
- Include these activities and timelines in the overall development schedule so that these can be managed to meet the target occupancy date
- Review the occupancy permit application checklist 90 days before the target substantial completion date
- Consider a pre-occupancy inspection (or dry run) with the Prime Consultant and the city/municipal staff to identify issues that might affect final occupancy approval
- Communicate promptly on issues that could delay occupancy and recommend remedial action to bring the project back on track

Timing Considerations

For projects with a time-sensitive occupancy date, consider whether stipulating the completion date in the tender documents will benefit the project, rather than waiting for the General Contractor to propose a time.

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Checklist Companion Document:

Development Team

Building Handover Meeting

Areas of Concern

- *A General Contractor could complete and hand over the building to the Owner/Operator without a formal turnover and without addressing all concerns upon occupancy*

Requirements and Responsible Parties

A building handover meeting should take place to formalize the turnover of the project from the General Contractor to the Owner/Operator and to address specific issues that the Owner/Operator may face as they begin operating and maintaining their building.

All stakeholders:

- Attend the building handover meeting. The Development Consultant/Project Manager, General Contractor, Prime Consultant, Owner/Operator representatives, including those responsible for building operations, and BC Housing development and operations staff should all be present at the meeting

Development Consultant/Project Manager:

- Once the Prime Consultant is satisfied an occupancy permit is ready to be issued, arrange the building handover meeting

The purpose of the meeting is to accomplish the following:

- Turn over the occupancy permit or other approvals from the authorities with jurisdiction
- Turn over building keys to the Owner/Operator
- Turn over project closeout documents, such as as-built drawings and O&M manuals
- Confirm the status of Owner/Operator's training on building systems
- Confirm the status of building commissioning activities
- Confirm access and security turnover
- Confirm move-in schedules
- Confirm transfer of utility bills from the General Contractor to the Owner/Operator
- Establish the status of minor deficiencies and confirm the schedule for correcting deficiencies
- Establish a procedure for addressing defects noted during the warranty period
- Identify issues the Development Team needs to address

Timing Considerations

We recommend the Owner/Operator plan for two to four weeks between building handover and tenant move-in to allow building and operating staff to familiarize themselves with the building's operating systems and to allow the General Contractor to correct minor deficiencies.

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Checklist Companion Document:

Development Team

Six-Month Review Meeting

Areas of Concern

- *Operators may need a review of building systems operations after initial occupancy*

Requirements and Responsible Parties

Six months after substantial completion, the Owner/Operator may request that the General Contractor undertake a review of the building systems or re-training for building staff to address any unexpected issues or questions, or to provide any clarification the staff needs as they begin to operate and maintain the building systems.

Development Consultant/Project Manager:

- Include the six-month building systems review in the development schedule
- Coordinate and arrange for the building systems training review

General Contractor:

- Provide additional training as needed to meet the stated requirements of the Owner/Operator

Owner/Operator:

- After occupancy, ensure staff note any issues that arise with their understanding of the building systems operations or maintenance
- Prepare a report of additional training or clarification needed by staff to send to the Prime Consultant, General Contractor and BC Housing operations staff

Timing Considerations

The Owner/Operator should assess the timing for the building systems training review in collaboration with the Prime Consultant. The review can be undertaken earlier or later than the six-month mark. We recommend the Owner/Operator allow building staff adequate time to thoroughly familiarize themselves with the systems before requesting the training review.

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Development Team

One-Year Warranty Review

Areas of Concern

- *Deficiencies may be overlooked or not addressed before the warranty period ends (especially in more remote regions of the province)*
- *The Owner/Operator may lose the opportunity to claim correction of deficiencies under warranty*

Requirements and Responsible Parties

After occupancy, the General Contractor is obliged to correct all deficiencies in labour and materials in accordance with the warranty provisions of the contract.

Prime Consultant:

- Within a year after substantial completion, preferably at the 10-month mark, review with the Owner/Operator any deficiencies that have been observed
- Prepare a one-year warranty inspection report and provide it to the General Contractor for correction or repair

General Contractor:

- Agree with the Owner/Operator on a process for addressing deficiencies noted after building occupancy. We recommend this process be agreed to at the building handover meeting. It will include:
 - Issuing notice of warranty deficiencies to the General Contractor and sub-trades
 - Preparing a schedule for remedying deficiencies
 - Arranging access to units
- At the end of the warranty period, correct all deficiencies noted in the one-year warranty inspection report prepared by the Prime Consultant. In conjunction with the Prime Consultant, establish a reasonable date for correcting and completing deficiencies and inform the Owner/Operator in writing

Owner/Operator:

- Before the one-year warranty inspection, prepare a list of noted deficiencies and submit it to the Prime Consultant
- Should the General Contractor fail to complete or correct their work after the warranty period, advise BC Housing and the bonding company of the breach
- Sign off on all corrected deficiencies

Timing Considerations

This meeting should take place at around the 10-month mark, post handover. The standard for the General Contractor's comprehensive warranty is one year, but may be increased to two years if necessary. The Owner/Operator should complete the inspection well in advance of the warranty expiry date to ensure they can claim for correction of deficiencies under warranty. They should be aware of their responsibilities under the warranty, should not undertake work that may void the warranty, and should seek the advice of the Prime Consultant or warranty provider if they are considering work outside the base contract during the warranty period.

Checklist Companion Document

Owner/Operator

Guide to Building Handover

Checklist Companion Document:

Owner/Operator

Commissioning and Design Review

Areas of Concern

- *The Owner/Operator's needs may be overlooked if they are not involved in the design stages*
- *An inefficient handover process without adequate commissioning and training could impact future building operations*

Requirements and Responsible Parties

We strongly recommend that building commissioning take place for all new construction projects. The commissioning practice can smooth the building handover process and assist operators in achieving the building's full potential by realizing energy savings; assuring indoor air quality; improving the functioning of systems, operations and maintenance; and increasing thermal comfort. The foundation for a good commissioning process (and therefore a better handover experience) is built early in the design stage.

Owner/Operator:

- Actively participate in the commissioning process from the design stage forward
- Discuss with the project manager how to proceed: whether to hire an independent commissioning authority (more easily done in larger centres) or to contract with a knowledgeable building operator who can act as a Commissioning Agent. In either case, contracts should contain detailed commissioning requirements in the specifications
- Participate in design review, ensuring that the society's needs are met during the design stage (schematic design, design development and working drawings – 50% and 100%)

Development Consultant/Project Manager:

- Initiate the commissioning process
- Ensure meetings take place with the Development Team, Commissioning Agent, and Owner/Operator during the design stage to ensure the owner's needs are well-defined
- Make sure the Owner/Operator is involved in reviewing design stage drawings

Commissioning Agent:

- Manage the commissioning process, develop a commissioning plan with the building Owner/Operator,
- Handle the following responsibilities:
 - Documenting system design intent and operating sequences
 - Verifying system performance based on documented functional testing and measurement
 - Training the building operations staff on system operations and maintenance procedures
 - Conducting a six-month review of system performance after occupancy

Timing Considerations

The building commissioning process should begin at the design stage, with the Owner/Operator and Development Consultant/Project Manager helping to develop the commissioning plan, by exploring and defining the Owner/Operator's needs.

Guide to Building Handover

Checklist Companion Document:

Owner/Operator

Service Contracts

Areas of Concern

- *Some Owner/Operators may not have full-time maintenance technicians, resulting in expensive maintenance contracts*
- *Owner/Operators are often unaware of their responsibilities for hiring external staff or contractors*

Requirements and Responsible Parties

Owner/Operator:

Information technology services

- The Owner/Operator is responsible for creating and maintaining its own IT service contracts for internet, cable TV and telephone services

Maintenance service contracts

- Begin considering maintenance contracts during the design stages, when equipment and supplies are being considered; this is especially important in more remote regions, where location is often of utmost importance to maintenance; also consider whether proprietary technologies (such as elevators) require specific maintenance contracts
- Include feedback from maintenance technicians and building operators (if employed) in decisions regarding the service contracts
- If the Owner/Operator can employ a full-time maintenance technician or operator, consider the option of putting out a request for proposal for a three- to five-year maintenance contract; alternatively, look to the community (and other non-profits) for potential coordination of maintenance services among several buildings or groups

Garbage and recycling

- Consider garbage and recycling contract options during the design stage; the size and capacity of garbage and recycling trucks varies among regions and towns; and the consequence of this on building design can be significant (i.e. outside major centres)

Fire and security alarm system and monitoring contracts

- Discuss placement of alarm system cameras and equipment during the design phase
- Monitoring contracts can be discussed later in the building process
- The fire alarm monitoring contract should be in place before substantial completion

Development Team:

- During the design stage, ensure comments/proposals are received from Owner/Operator regarding maintenance contracts, proprietary technologies, garbage and recycling considerations, and alarm system placement

Guide to Building Handover

Timing Considerations

IT services, maintenance and garbage/recycling contracts should be procured three months before building handover and occupancy. Maintenance service contracts, including garbage and recycling, should be considered in the design stages. We recommend that the service contracts be considered during the design stage in order to ensure all installed equipment (elevators, for example) can be serviced within an acceptable budget and schedule.

Guide to Building Handover

Checklist Companion Document:

Owner/Operator

BC Housing Operations Consultations

Areas of Concern

- *Societies are unsure of when to contact BC Housing Operations in the building process*

Requirements and Responsible Parties

The BC Housing Operations team, including the project's NPPM, is available from the project's early stages, to discuss budgeting, operating agreements, and to provide guidance on the general operations of the building and staff.

Owner/Operator:

- Begin discussions with project NPPM regarding project's operating agreement
- Review Start-Up package; ask questions if any areas lack clarity

NPPM:

- Train the Owner/Operator in "Housing Registry"
- Discuss board governance issues, financial controls and succession planning
- Ensure there is a plan for staff recruitment, orientation and training
- For new Owner/Operators, provide training on *Residential Tenancy Act*, Employment Standards, emergency procedures

Timing Considerations

Initiate consultation with the NPPM prior to construction start. Begin discussion of a communications plan with NPPM throughout the project's construction process, and beyond.

Guide to Building Handover

Checklist Companion Document:

Owner/Operator

Furnishings, Equipment and Supplies

Areas of Concern

- *If not enough time is allowed for ordering furnishings, occupancy could be delayed*

Requirements and Responsible Parties

The Owner/Operator is responsible for considering the need for furnishings, equipment and supplies (in common spaces and for office use), and for determining how these purchases will be funded. As some furnishings may fall under the contract agreement with BC Housing, the Owner/Operator should ensure the products being purchased fit within the project's allowable financial scope. Furnishings can include:

- *Office furniture:* Consider the number of offices, type of desks/chairs needed, meeting room tables, etc.
- *Furniture for living room/dining room/lounge spaces:* Consider the number of couches, chairs, loveseats, tables, shelving units, etc.

Equipment can include:

- Computers, printers, fax machines, photocopy machines
- First aid and other safety equipment
- Entertainment equipment
- Janitorial supplies

The funding for janitorial supplies may fall within several different budget lines. The Owner/Operator should determine how and where funding will be used for these supplies.

Owner/Operator:

- Work with the Development Consultant/Project Manager and/or BC Housing to confirm funding sources

Timing Considerations

The Owner/Operator should request budgeting advice during the design phase. We recommend the furnishings be ordered six months in advance of proposed occupancy, to allow adequate time for delays and delivery issues. Office and other equipment can be ordered three months in advance of occupancy.

Guide to Building Handover

Checklist Companion Document:

Owner/Operator

Scheduling and Staffing

Areas of Concern

- *Handover and tenant move-in periods tend to be hectic and not well planned*

Requirements and Responsible Parties

The Owner/Operator is responsible for the performance and orientation of building and program staff. Orientation may or may not include a building walkthrough with the Commissioning Agent or General Contractor. Plan this in advance and make sure the necessary parties are aware and will be present and prepared.

It is essential to have enough staff in the first year to optimize the learning curve and operations performance in the new building.

We recommend the Owner/Operator establish a plan for tenant move-in to take place over a few weeks after building handover, if possible. This timeline will ensure a smooth transition and provide time for building operators to become familiar with the building workings and deficiencies (if any). In some cases, a slow move-in may not be possible, or changes to the program or client type may occur, so it is important the plan be flexible.

Owner/Operator

- Consider the number of staff required and when they will be needed
- Create an orientation list and schedule for new staff and volunteers
- Prepare the tenant move-in schedule

Timing Considerations

Staffing needs should be considered early in the construction process. If staff, especially maintenance staff, can be hired in advance of handover, they should be included in the commissioning and building handover meeting. If budgetary restrictions prevent maintenance or operations staff from being hired, consider the possibility of reaching out to the non-profit community; look at the potential to hire a “shared” maintenance person, for instance. If the Owner/Operator already has maintenance or operations resources, ensure their scheduling and responsibilities are well laid out before handover. Prepare an orientation list and schedule up to three months before building handover, and a flexible tenant move-in schedule up to two months before handover.

Guide to Building Handover

Checklist Companion Document:

Owner/Operator

Pre-Handover Meeting

Areas of Concern

- *Training provided by General Contractor or consultants may not be adequate or may be too sophisticated*
- *Training often covers too much information too quickly and can be overwhelming*

Requirements and Responsible Parties

The Owner/Operator should meet with the Commissioning Agent (or the General Contractor if there is no Commissioning Agent) to develop a schedule for building systems training. The building operator/maintenance technician should attend, if possible. The meeting should take place early in the design/building stages to ensure all the Owner/Operator's project requirements will be met during training.

Important points to discuss include the training schedule, timing between training sessions and a list of systems on which training should be provided. These may have been laid out in the commissioning plan, devised during the early design stage. Suggested training topics include:

- Mechanical and plumbing systems:
 - o Fire protection
 - o Plumbing
 - o Ventilation
 - o Heating/cooling
- Electrical systems:
 - o Power distribution and lighting fixtures and controls
 - o Fire alarm
- Security system
- Building automation

Owner/Operator:

- Confirm the General Contractor's training schedule
- Discuss with the General Contractor the possibility of a follow-up meeting or training session in 6 months. Staff should be better equipped to ask questions after having worked with the equipment

Development Consultant/Project Manager:

- Confirm the General Contractor's training schedule
- Organize a meeting with the Owner/Operator (or representative), Commissioning Agent (if applicable) and General Contractor to discuss the building handover and training schedules
- Discuss closeout documents (O&M manuals, as-built drawings, commissioning documents (including balancing reports, commissioning report, etc.), and timing with the General Contractor; ensure the General Contractor notes the timing of these items in their schedule.

Timing Considerations

We recommend that training sessions with the General Contractor and/or Commissioning Agent be scheduled 60 days in advance of substantial completion, to ensure all subcontractors are prepared and enough time is available for the Owner/Operator to hire or schedule a building operator or maintenance technician.

Guide to Building Handover

Checklist Companion Document:

Owner/Operator

Insurance (Post-Construction)

Areas of Concern

- *The building may not be insured during the transition from construction to operation*

Requirements and Responsible Parties

The Owner/Operator is responsible for procuring a post-construction operating insurance policy, and is expected to obtain a quote from Marsh Canada, which has set up a group insurance program for non-profit housing societies. This quote need not necessarily be used; the Owner/Operator may choose to procure an insurance policy from another vendor. However, any subsidy from BC Housing will be limited to the maximum amount of the Marsh Canada quote.

Insurance must cover several aspects of building liability. This list can be found in *Schedule A for Mortgage Reference* (o38). Ask the project's NPPM for more information.

Owner/Operator:

- Obtain a quote from Marsh Canada
- Procure a post-construction operating insurance policy

Timing Considerations

The operating insurance policy should be in place at building handover.

Guide to Building Handover

Checklist Companion Document:

Owner/Operator

Maintenance and Renewal Plan

Areas of Concern

- *Owner/Operators may not have well-organized information on maintaining the installed materials and building systems*

Requirements and Responsible Parties

The maintenance and renewal (M&R) plan is an Owner/Operator's document that contains the information needed to plan and conduct regular maintenance on their project. The M&R plan should be based on the O&M manual supplied by the General Contractor at substantial completion.

Owner/Operator:

- Work with an M&R consultant to ensure the M&R plan provides information that is relevant to operating needs and set-up
- Submit a draft M&R plan for review by BC Housing and the Prime Consultant
- Submit two hard copies (three-ring-binder format) along with an electronic version, within 30 business days of written approval of the draft M&R plan

Development Consultant/Project Manager:

- Within 30 business days of receiving the General Contractor's O&M manual, assist the Owner/Operator in engaging qualified consultants to prepare the M&R plan

M&R consultant:

Prepare an M&R plan in accordance with BC Housing guidelines. The plan should include the following:

- All project data and contact information regarding the design and construction of the building, including funding agencies, consultants, sub-consultants, contractors, trades and major suppliers
- All pertinent data regarding municipal approvals, such as building and occupancy permits
- All warranties, warranty coverage and contact information for all building systems, equipment, products, materials and components of the building in an easy-to-access and user-friendly format
- Design and maintenance information for all building systems, including architectural, mechanical, electrical, building envelope, landscaping and site services
- Checklists, inspection forms and other documents recommended for regular routine, annual and cyclical maintenance
- Recommended maintenance-planning and building-renewal spreadsheets, including estimates for a 30-year planning period

Timing Considerations

We recommend that the Owner/Operator contract out the preparation of the M&R plans as soon as the General Contractor's O&M manuals have been submitted. This is to ensure all materials required for the M&R plan have

Guide to Building Handover

Checklist Companion Document:

Owner/Operator

been submitted and that any missing documents or information can be identified and brought to the General Contractor's attention before the one-year warranty period ends.

Guide to Building Handover

Checklist Companion Document:

Owner/Operator

Training and Orientation

Areas of Concern

- *Proper training for building operators often does not occur*
- *Orientation for all building staff is often short and/or incomplete*

Requirements and Responsible Parties

The Owner/Operator, Commissioning Agent and members of the Development Team should all attend the training and orientation meeting. The training should occur at this time, and should follow the schedule and cover the topics previously discussed. The Owner/Operator's staff should receive a walkthrough and general orientation of the building. See "Training/Pre-Handover Meeting" for suggested topics to cover.

Owner/Operator

- Be present during the final commissioning and handover meeting
- Ideally, select or hire a maintenance technician/operator (or secure a maintenance contractor) to attend the meeting, and organize a group of staff who will participate in the walkthrough. This will ensure the Owner/Operator receives training customized to their building operators' level of knowledge and as many staff as possible will be oriented while the contractors are present
- Ensure that notes are taken and questions asked

Development Consultant/Project Manager

- Set up the training and orientation session

Commissioning Agent and/or Prime Consultant and General Contractor

- With the Owner/Operator, develop a protocol for deficiency work post-occupancy
- Present the training materials to maintenance staff. Conduct training on all building systems
- Conduct a walkthrough and orientation for general Owner/Operator staff

Timing Considerations

The final commissioning meeting should take place between substantial completion and occupancy. The walkthrough should take place during this meeting.

Training should take place over a one- to three-week period, upon building handover. Schedule and discuss this training with the necessary contractors as part of the commissioning process and as defined in the commissioning plan.

Guide to Building Handover

Checklist Companion Document:

Owner/Operator

Building Handover Meeting

Areas of Concern

- *The General Contractor may hand over the building to the Owner/Operator without a formalized process*

Requirements and Responsible Parties

The purpose of the building handover meeting is to accept the completed project from the General Contractor. During this meeting, keys will be exchanged, and the Development Team will submit project closeout documents. The building systems training that the General Contractor will provide to the Owner/Operator should be confirmed. (See “Development Team: Building Handover Meeting” for a complete list of activities expected during this meeting.)

Development Consultant/Project Manager:

- Organize the building handover meeting and involve all the necessary people
- Prepare agenda for the meeting in consultation with the Owner/Operator

Owner/Operator:

- Provide input to the Development Consultant/Project Manager for the meeting agenda.
- Ensure that all maintenance staff (newly hired and regular staff) are present
- Ensure all training questions are answered and maintenance staff feel comfortable enough to operate the building

General Contractor:

- Deliver the final documents, keys and all other necessary closeout items

Non-Profit Portfolio Manager:

- Consider attending this meeting, time permitting, to be aware of any potential issues or and project progress

Timing Considerations

Hold this meeting after the occupancy permit has been received, prior to tenant move-in.