

New Building? BC Housing Resources to Get the Best Outcome



HOUSING CENTRAL BC'S AFFORDABLE HOUSING CONFERENCE

NOVEMBER 22, 2016



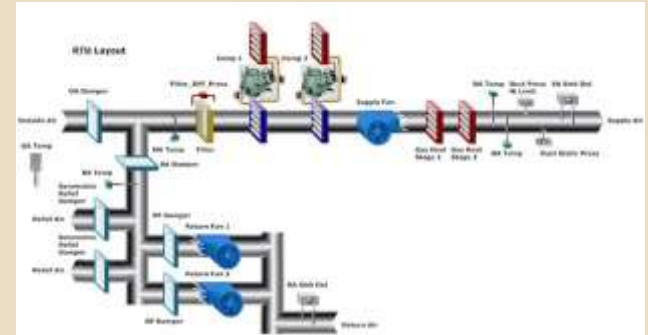
Today's Agenda



- What are the major concerns we've heard?
- Resources we've developed
 - Building Handover Guide, Schedule and Checklists
 - Building Commissioning Guide
 - Resources for Non-Profit Housing Providers
- Technical issues, lessons learned, recommendations
- Ask the Expert

J. Willows Building Systems Advisors
Principal / Senior Advisor

Common concerns



Building Handover Documents

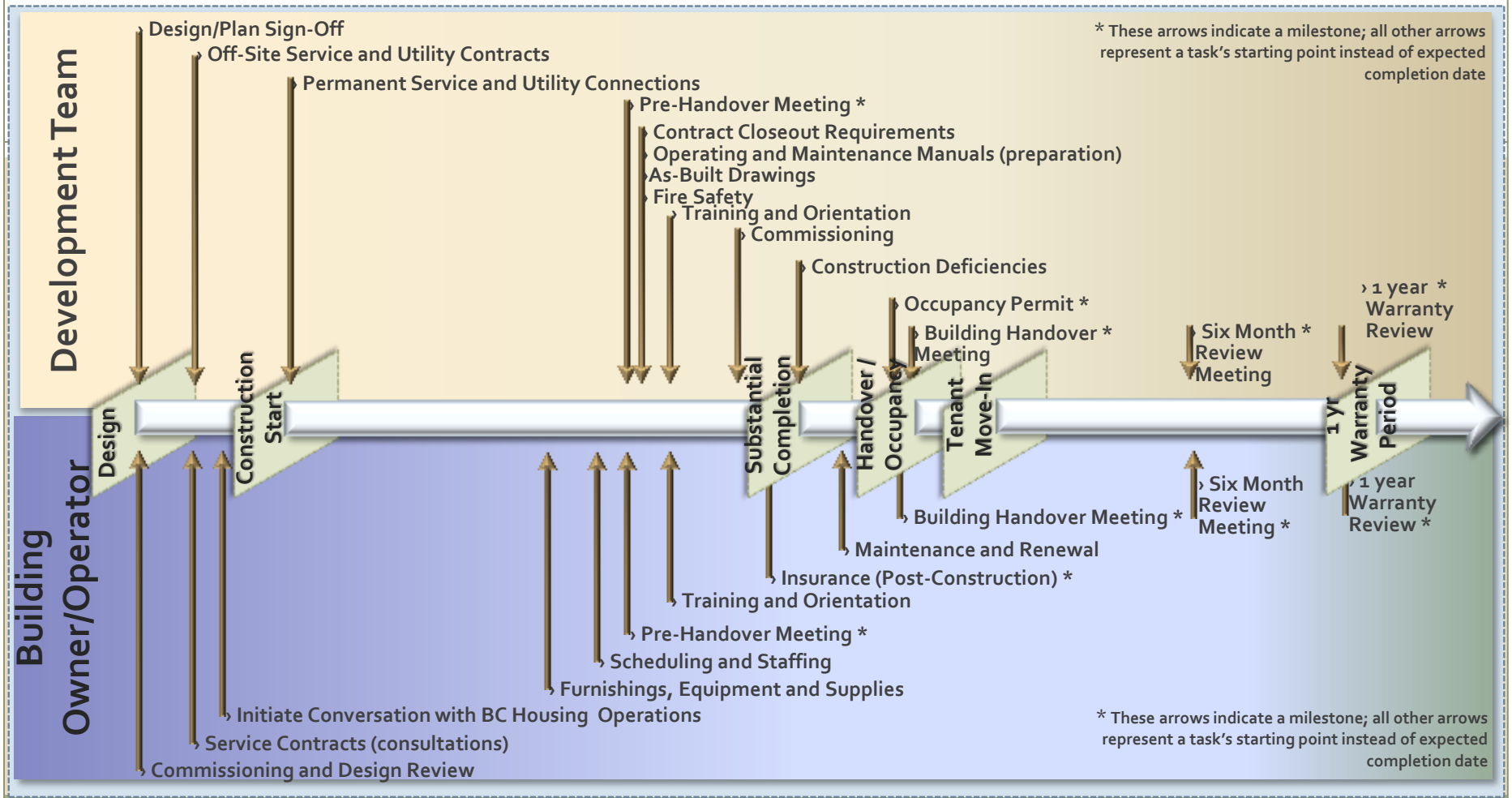


Building Handover Document contains:

- Guide to Building Handover
- Schedule and Checklists

Responsibilities and checklist split up by team

- Development Team
- Owner/Operator (Society)



Guide to Building Handover

Checklist: Development Team

✓		RESPONSIBLE PARTIES:	START DATE:	SIGN-OFF DATE:
<input type="checkbox"/>	Operating and Maintenance Manuals			
<input type="checkbox"/>	Draft table of contents from General Contractor			
<input type="checkbox"/>	<input type="checkbox"/> Prime Consultant review and approval			
<input type="checkbox"/>	Draft operating and maintenance manuals from contractor (electronic)			
<input type="checkbox"/>	<input type="checkbox"/> Prime Consultant review and approval			
<input type="checkbox"/>	<input type="checkbox"/> BC Housing review and approval			
<input type="checkbox"/>	Approved operating and maintenance manuals from contractor			
<input type="checkbox"/>	<input type="checkbox"/> Two sets (three-ring binder and electronic) to Owner/Operator			
<input type="checkbox"/>	<input type="checkbox"/> One set to BC Housing (electronic only)			
<input type="checkbox"/>	Deficiency holdback			
<input type="checkbox"/>	As-Built Drawings			
<input type="checkbox"/>	Review by Prime Consultant and BC Housing (electronic)			
<input type="checkbox"/>	Approved as-built drawings from General Contractor:			
<input type="checkbox"/>	<input type="checkbox"/> Two sets (white prints and electronic) to Owner/Operator			
<input type="checkbox"/>	<input type="checkbox"/> One set to BC Housing (electronic only)			
<input type="checkbox"/>	Deficiency holdback			

Building Commissioning Guide

Building Commissioning Benefits:

- Fewer change orders and system deficiencies
- Higher quality control
- Better planning and coordination
- Reduced energy consumption
- Better occupant comfort
- Improved systems and equipment function
- Improved building O&M



Building Commissioning Guide

Pre-Design

- Select a commissioning lead
- Pre-Design phase commissioning meeting
- Begin developing *Owner's Project Requirements*
- Develop initial *Commissioning Plan*

Project Development
Funding (PDF)

Design Phase

- Design phase commissioning meeting
- Perform commissioning-focused design review
- Update *Commissioning Plan*
- Develop commissioning requirements for the specification
- Begin planning for verification checklists, functional tests, O&M manuals, and training requirements

Provisional Project
Approval (PPA)

Construction Phase

- Construction phase kick-off meeting
- Review submittals, monitor development of shop drawings
- Request and review *O&M manuals* as they become available
- Perform ongoing construction observation
- Perform verification checks
- Perform diagnostic monitoring
- Perform functional testing
- Develop *Commissioning Report* and *M&R Plan*
- Develop *Recommissioning plan*
- Verify and review training of operations staff

Final Project Approval (FPA/COM)

Post Construction/ Operational Phase

- Resolve outstanding commissioning issues
- Perform seasonal/deferred testing
- Perform warranty review

BC Housing Project Approval Stages

Building Commissioning Guide

Appendix A

Commissioning Responsibilities Matrix

Legend:	Project Manager / Development Consultant	Operations Personnel	Owner Rep/BC Housing	Technical Experts /Design Team	Construction Manager (CM)/ General Contractor	Commissioning Agent	Architect
R= Responsible C=Consult							
A = Approval I = Inform							
Pre-Design Phase							
Identify Commissioning Team	R	I	A	C/I			C
Develop Owner's Project Requirements	R	C	A	C			C
Develop preliminary commissioning scope	R	C	A	C			C
(If hired at this stage) Contract for Commissioning Authority services	R		A	I			I
Develop preliminary Commissioning Plan	C	I	C	I		R	I
Establish budget for all Cx work and integrate costs for commissioning into project budget	R		A	C		C	C
Include time for Cx in initial project schedule	R	I	C	C		C	C
Include Cx responsibilities in Design Team and CM scope of services	R		A	C		C/I	C

Resources for Non-Profit Housing Providers



Tips for dealing with your design team:

- Understand the Importance and Purpose of the IDP
- Communicate
- Ask Questions
- Plan Ahead

Part **1**

Resources for
Non-Profit Housing
Providers

How to get the most out of your design team

Resources for Non-Profit Housing Providers



	System	Pros	Cons	Service Required	DDC System	Staff Qualifications
Air- or ground-source heat pump	Air-source or ground-source heat pump	2-3 times or more efficient than electric baseboard or high-efficiency furnace per unit of input energy; low GHG emissions	May need specialized service professionals	Must be closely monitored using direct digital control (DDC) system; filters must be cleaned regularly; coolant flow, temperatures and quality of coolant must be monitored periodically Recommend extended warranty and servicing by installer/manufacture	Required	Class 4 building engineer or equivalent, and/or qualified controls and mechanical contractors required
In-floor radiant heating		Very efficient way of distributing heat; people feel warmer even though less heating is required Keeps the full floor space open for furniture	Slow to respond to thermostatic control; may require tenant education; difficult to contain heat in small suites especially with concrete slab	Fluid pressure, temperature, and quality need to be monitored Contract with qualified mechanical contractor required	Recommended	Building personnel should be familiar with hydronic heating systems and/or receive basic training from installer or mechanical contractor
Electric baseboards and domestic hot water boiler		Easy to operate and low cost to repair or replace; least capital and maintenance cost option; temperature is directly controlled by tenants	Not very durable (susceptible to damage by tenants); can be used to hide items; can create fire hazard if used to hide items; very difficult to convert to future district energy systems	Minimal service required If combined with gas boiler for domestic hot water heating may require occasional servicing by mechanical contractor	Not required	Minimal building operator experience required

Part **2**

Resources for
Non-Profit Housing
Providers

Mechanical systems pros and cons -
Who do I need to hire to operate my building?

What is “Normal” vs “Not Normal” in Operations?

Situation	Normal	Not Normal
Equipment or systems don't seem to be working correctly	Occasional warning lights that are readily addressed with information provided in the O&M manual	Frequent and persistent warning lights; equipment appears to have stopped working entirely
Complaints from tenants about hot water	It should take less than one minute for hot water to reach the faucet (depending on how the system was designed)	It takes more than two to three minutes for hot water to reach the faucet
Temperature complaints in the building	10-20% of tenants complaining periodically, especially as seasons change (for example, when building transitions from heating to cooling or vice versa)	Large sections of the building with no heat or cooling as appropriate; significant and persistent over-/under-heating issues
Building staff do not know who to contact when heating problems exist	Contact information for installed systems and materials in the building provided by the contractor upon completion	Late or incomplete submission of warranty and O&M manuals
Contract personnel attendance at site	When the building is complete, you can expect these individuals to leave, and not return unless they are called back for warranty items, or service calls	Contractors do not return for warranty items or for service calls when requested

What can you do differently?



- Get involved early
- Attend design meetings
- Hire operations team early, if possible
- Share resources with other societies
- Hire Commissioning Authority early
- Consider 3rd party design reviews

Resources Links



- Building Handover Web Page
[http://www.bchousing.org/Partners/Building_handover
Guide to Building Handover
Schedule/Checklist](http://www.bchousing.org/Partners/Building_handover_Guide_to_Building_Handover_Schedule/Checklist)
- Building Handover Web Page
[Building Commissioning Guide](#)
- Resources for New Developments Managed by Non-Profit Housing Partners
[Resoruces for Non-Profit Housing Providers](#)

Technical issues, lessons learned, recommendations



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Ask the Expert

