Health Capital Policy Manual

Policy Name: Low Carbon, Climate Resilient and Sustainable Health Facilities	
Chapter: 11	**Effective Date:** January 14, 2024

1. Objective

To align planning and design of new and replacement health facilities with Provincial legislation, strategies and action plans for minimizing greenhouse gas (GHG) emissions, managing climate risks, and improving environmental sustainability.

2. Scope

This policy applies to health authorities and their new and replacement construction projects.

3. Context

New and replacement health care facilities represent a key opportunity to minimize the negative impacts of health care infrastructure on the environment and climate and maximize resilience to changes in the climate and in ecosystems. Low carbon, climate resilient and sustainable health facilities can address both climate change mitigation and adaptation, as well as environmental sustainability. The following are relevant statutes, regulations and policies related to:

3.1. Low Carbon Buildings

Low carbon buildings are those which cause a small amount of GHG emissions to be added to the atmosphere.

- The *Climate Change Accountability Act* established targets to reduce BC GHG emissions 40% below 2007 levels by 2030, 60% by 2040 and 80% by 2050.
- "CleanBC" increased GHG mitigation targets to 50% reduction in emissions for public sector buildings by 2030. The "CleanBC Roadmap to 2030" established requirements for all new public sector buildings to be zero carbon by 2030.
- The National Research Council of Canada and Canada Green Building Council have guidelines on completing life cycle assessments for new and replacement health facilities to determine pathways to lowest GHG emissions.

3.2. Climate Resilience

The BC public sector organizations, including health authorities, are required to manage risks that can reasonably be expected to result from a changing climate (s. 6.1, the *Climate Change Accountability Act*).

- The BC "Climate Preparedness & Adaptation Strategy" established a goal for provincial infrastructure, including health facilities, to be built to withstand climate impacts and extreme weather conditions.
- The "Climate Resilience Guidelines for BC Health Facility Planning & Design", developed by the BC health authorities, established a four-step process to evaluate climate risks and identify resilience measures for health facility capital projects.
- The BC "Climate Resilience Framework & Standards for Public Sector Buildings" (Appendix 9, the BC "Environmental, Social and Governance Framework for Capital") introduced a systematic and consistent approach to improve the climate resilience of all public sector buildings.

3.3. Environmental Sustainability

In alignment with the "Clean BC Roadmap to 2030" and Provincial legislation (e.g., *Environmental Management Act*), health capital assets, especially facilities, are to be environmentally sustainable and reduce environmental deterioration and impacts by optimizing the use of resources and minimizing the release of waste into the environment.

3.4. Green Building Standards

New or replacement facilities are to be designed to seek certification to one of the standards listed below:

- LEED v4.1 Gold certification is considered the baseline for major new or replacement health care facilities;
- Passive House Standard;
- International Living Future Institute (Core Standard) or
- Zero Carbon Building Standard - Design (Canada Green Building Council).

4. Requirements:

Health authorities are required to plan, design and construct new and replacement health care facilities to be low carbon , climate resilient and environmentally sustainable. To do so, health authorities are required to incorporate an integrated approach including the following:

4.1 Low Carbon Buildings Modeling

4.1.1 Undertake energy modelling including site-specific future weather files and an assessment of options by using whole-building energy modelling software or other methods for calculations, depending on the size and complexity of the project.

Energy modeling should include:

Baseline: **LEED Gold**: adopt energy efficiency measures through low carbon heating and cooling systems that meet operational requirements under local conditions and include electrification measures that are cost neutral in comparison to conventional natural gas systems.

Option 1 - Low Carbon Building: an enhanced version of the baseline, with additional low carbon design features with an incremental cost of up to 3% of construction costs.

Option 2 - Net Zero Carbon Building: a further enhanced design to reduce site-level emissions to net zero carbon, through either fully electrified building design or on-site renewable energy generation and to include scenario analysis for incorporating renewable natural gas.

Note: The assessment of options is to include a presentation of operating costs across a range of natural gas and electricity price scenarios. Energy modelling study reports are included in business plans for new and replacement health facilities to provide sufficient information on the scope and analysis necessary to inform decisions.

4.1.2 Conduct a life cycle assessment (LCA) of the indicative design in parallel to the low carbon study. Outputs from LCA are to support a low carbon study to determine lowest cost pathway to GHG emission reductions. LCA is to follow the "National Guidelines for Whole-Building Life Cycle Assessment" (e.g., A1 to C4) produced by the National Research Council of Canada (see section 6. References).

4.2 Climate Resilience

Complete the following as prescribed in the BC "Climate Resilience Framework & Standards for Public Sector Buildings":

- Identify the facility's criticality and importance to the health sector;
- Conduct an exposure screen and identify potential impacts to the facility;
- Determine climate risks through a climate risk assessment;
- Identify relevant minimum climate resilience requirements and any additional resilience strategies; and
- Conduct additional climate risk studies if identified as necessary by a qualified professional.

In addition, undertake the following as described in the "Climate Resilience Guidelines for BC Health Facility Planning & Design":

- Complete a resilient design review to identify and track design strategies that meet established climate resilience requirements; and
- Conduct a resilience audit to ensure that established climate resilience requirements are met.

4.3 Environmental Sustainability

Complete assessments and management plans for new and replacement construction projects including the following as applicable:

- Sustainable water management plan considering quality, use, and end use of all water either supplied to the facility or from precipitation.
- Sustainable materials management plan considering waste reduction and healthy materials in construction and ongoing building operation.
- Sustainable transportation management plan considering active and clean transportation modes with design measures relevant to user demand.
- Natural environment management plan considering site user health and wellbeing, incorporating Indigenous traditional ecological knowledge, and natural assets.

4.4 Green Building Standards Certification

- Design new and replacement facility to seek certification to green standards mentioned in section 3.4. Incorporate in business plans LEED or equivalent certification costs, draft scorecard and timelines.
- Register the health facility project with:
  - Green Business Certification Inc. to obtain LEED Gold certification following the most recent version of the standard (e.g., LEED Healthcare BD+C V4.1).
  - For equivalent standards (Passive House Standard, International Living Future Institute (Core Standard), and Zero Carbon Building Standard - Design), new and replacement health facilities are to be registered with their oversight bodies to be certified and are to demonstrate how the standards are equivalent to LEED Gold certification.

5. Definitions

"**Adaptation**" to climate change, in human systems, is the process of adjustment to actual or expected climate and its effects to reduce harm and/or harness beneficial opportunities.

"**Climate**" is the average weather in a place (variables include temperature, precipitation, wind) over a period of time (typically, over 30 years).

"**Climate Change**" refers to a change in the state of the climate, which can be identified by changes in the mean and or variability of its properties that persist for an extended period of time; typically, decades or longer. Climate change can be due to natural processes or anthropogenic changes.

"**Climate Resilience**" is the ability to anticipate, respond to, cope with, recover from, and adapt to climate-related shocks and stresses despite an unstable climate.

"**Climate Risk**" refers to the potential for adverse consequences for human or ecological systems. Risk results from dynamic interactions between climate-related hazards with the exposure and vulnerability of the affected human or ecological system to the hazards.

"**Environmental Sustainability**" refers to responsible interactions with the environment to avoid depletion or degradation of natural resources and allow for long-term environmental quality and even regeneration.

"**Greenhouse Gas (GHG) Emissions**" refers to any gas, both natural and anthropogenic, that has the property of absorbing infrared radiation emitted from Earth's surface and reradiating it back to Earth's surface, thus contributing to the greenhouse effect.

"Life Cycle Assessment" refers to a cradle-to-grave assessment of environmental impacts associated with all the stages of building life, including raw material extraction, materials processing, construction, operation, and decommissioning.

"**Mitigation"** of climate change is human intervention to reduce greenhouse gas emissions into the atmosphere or enhances sinks to store these gases.

"**Sustainability**" means meeting the needs of the present without compromising the ability of future generations to meet their own needs.

6. References

Provincial Legislation

- *Climate Change Accountability Act*
- Carbon Neutral Government Regulation
- *Environmental Management Act*
- *Greenhouse Gas Reduction (Renewable & Low Carbon Fuel Requirements) Act*
- *Zero-Emissions Vehicle Act*

Provincial Strategies & Action Plans

- "CleanBC"
- BC "CleanBC Roadmap to 2030"
- BC "Climate Preparedness & Adaptation Strategy".
- BC "Environmental, Social & Governance Framework for Capital".

Health Organizations

- BC Health Authorities. (2020). Climate Resilience Guidelines for BC Health Facility Planning & Design.
- Energy & Environmental Sustainability. (2022). Low Carbon Resilience & Environmental Sustainability Guidelines for Health-Care New Construction.
- Interior Health. (2023). Climate Change & Sustainability Roadmap 2023-2028.

- Vancouver Coastal Health, Fraser Health & Health Emergency Management BC. (2022). HealthADAPT: Climate Change & Health Adaptation Framework.

External

- American Society of Heating, Refrigerating & Air-Conditioning Engineers. (2022). ASHRAE Standard 90.1-2022: Energy Standard for Sites & Buildings Except Low-Rise Residential Buildings.
- Canadian Standards Association. (2018). CSA Z8000-18: Canadian Health Care Facilities.
- World Health Organization. (2020). WHO Guidance for Climate-Resilient & Environmentally Sustainable Health Care Facilities.
- National Research Council of Canada. (2022). National Guidelines for Whole-Building Life Cycle Assessment.

Health Capital Policy Manual

Policy Name: Use of Wood in Health Care Facilities	
Chapter: 14	**Effective Date:** February 22, 2021

1. Objective

To provide guidelines to health authorities on the use of wood in construction of health care facilities to ensure compliance with the requirements of the *Wood First Act*.

2. Scope

This policy applies to health authorities in the process of planning and designing new health care facilities.

3. Context

The *Wood First Act* (2009) promotes the use of wood as the primary building material in all new provincially funded buildings in a manner consistent with the building regulations within the meaning of the *Building Act*.

The BC Building Code and the Vancouver Building By-law impose restrictions regarding use of major materials, fire and life safety design by classifying most health care facilities as non-combustible buildings (requiring heavy timber, steel/concrete construction); however, the use of combustible construction materials, such as wood, can be considered in certain circumstances.

The incorporation of wood as a construction material offers unique challenges in a health care setting not found in other building types. The requirement in acute care settings for homogeneous finishes that are easily cleaned and disinfected, do not harbour organic growth and are durable enough to withstand many years of surface abuse, eliminates wood as a viable material in many clinical settings.

However, there are some innovative solutions outside clinical zones that are appropriate for use of wood as a finish material, such as waiting rooms, hallways and lobbies, or as a structural component in exterior cladding, interior walls, millwork and acoustic panel treatments. For guidance, the Wood Use Matrix for Health Care (see Appendix 1) will be helpful to health authorities when considering the use of wood in the construction of health care facilities.

4. Requirements

Health authorities are required to consider:

1. The use of wood in design of new health care facilities when acceptable by the *Building Act,* BC Building Code, other regulations or building by-laws.
2. The Wood Use Matrix for Health Care to guide health facility design decisions concerning the use of wood.

5. References

Building Act

Vancouver Building By-law

Wood First Act

APPENDIX 1

Wood Use Matrix for Health Care[1]

Legend:	***1) An Acceptable Solution with wood is permitted***
	2) An "Alternative Solution" with wood is relatively easy to implement
	3) An "Alternative Solution" with wood will require advanced analysis
	4) An "Alternative Solution" in wood would require extensive research

Sector: Health

Building Elements		Building Type			
		Acute - Hospitals, health centres, residential care			Non-acute
		1 storey	2 storey	3+ storeys	Offices, public health, minor clinics
PRIMARY STRUCTURAL SYSTEM	Columns, Beams & Braces	1	2	4	2
	Floor Structure	2	2	4	2
	Exterior Walls	1	2	4	2
	Foundation (v.)	4	4	4	4
	Shear Walls	4	4	4	4
	Bearing Walls	2	2 / 3	4	2 / 3
	Fire Walls	4	4	4	4
	Roof structure (incl columns & braces)	1	2	4	2
	Stairway & elevator shafts	4	4	4	4
SECONDARY STRUCTURE	Convenience Stairs	1	2	3	2
	Entrances & canopies	2	2	3 / 4	2
	Fire separations	1	2	4	2
	Enclosures for mechanical equipment	1	2	4	2
ARCHITECTURAL	Partitions (interior)	2	2	4	2
	Exterior Curtain Walls	3	3	4	3
	Ceilings	2	3	4	2
	Exterior cladding	1	2	4	2
	Parapets (excluding Parapets of Firewalls)	1	2	4	1
	Ceiling bulkheads	1	2	4	1
	Flooring	2	2	4	2
	Doors	1	2	2	1
	Windows	3	3	3	2 / 3
	Skylights	3	3	3	2 / 3
	Trim, panelling, & features	2	2	2	2
	Millwork	2	2	2	2
	Wall and corner guards	2	2	2	2
	Architectural woodwork, other than the above	1	1	4	1
	Landscape - hard landscaping and/ or structures	1	1	1	1
	perimeter fences	1	1	1	1

[1] Developed in 2011 under the leadership of Forestry Innovation Investment FII - a provincial Crown market development agency for forest product, accountable to the B.C. Minister of International Trade, tasked in part with implementing the Wood First Initiative on behalf of the provincial government.