

# Climate Resilience Guidelines for BC Health Facility Planning & Design

VERSION 2.0  
MAY 2024





The background of the entire page is a close-up photograph of green fern fronds. The fronds are long and feathery, with many small leaflets. They are slightly out of focus, creating a soft, natural texture. The lighting is even, highlighting the vibrant green color of the leaves.

## Land Acknowledgement

We acknowledge with respect and gratitude that this report was produced on the traditional, ancestral, and unceded territory of the Coast Salish Peoples, including the xʷməθkwəy̓əm (Musqueam Nation), the Skwxwú7mesh Úxwumixw (Squamish Nation), and səliilwətaʔt (Tsleil-Waututh Nation) whose deep connections with this land continue to this day.

Health facilities in British Columbia are situated on the traditional, ancestral, and unceded territories of more than 200 First Nations across the province. There is systemic racism within and throughout our health system, and we have the responsibility and power to create more culturally safe and appropriate environments of care. This document, through a distinctions-based approach, is intended to listen to the expertise of First Nations, Métis, and Inuit Peoples, while privileging the voices of First Nations across the province on whose respective territories' health facilities operate. To understand and adapt to climate change, we centre Indigenous knowledge, particularly local First Nations' land-based expertise, on health facility projects in a way that strengthens both climate resilience and reconciliation.

# Summary

The *Climate Resilience Guidelines for BC Health Facility Planning & Design* (Version 2.0) mark a significant step forward in addressing the challenges of *climate change* within the healthcare sector. Initially released in 2020, the 'Health Facility (HF) Climate Resilience Guidelines' have been pivotal in providing adaptable recommendations aimed at enhancing the resilience of healthcare infrastructure against climate-related hazards. This update, Version 2.0, represents an evolution of the document, ensuring it remains a living tool that builds on past successes, integrates new insights, and aligns with the latest guidance from the Province through the *Climate Resilience Framework & Standards for Public Sector Buildings*.

The urgency to build climate resilient health facilities has never been more apparent. British Columbia's healthcare sector has faced the tangible impacts of climate change, including extreme weather events that have led to loss of life, service disruptions, infrastructure damage, and increased operational costs. Designing health facilities that can anticipate, cope with, recover from, and adapt to climate-related shocks and stressors is crucial for the *sustainability* of healthcare services and human well-being.

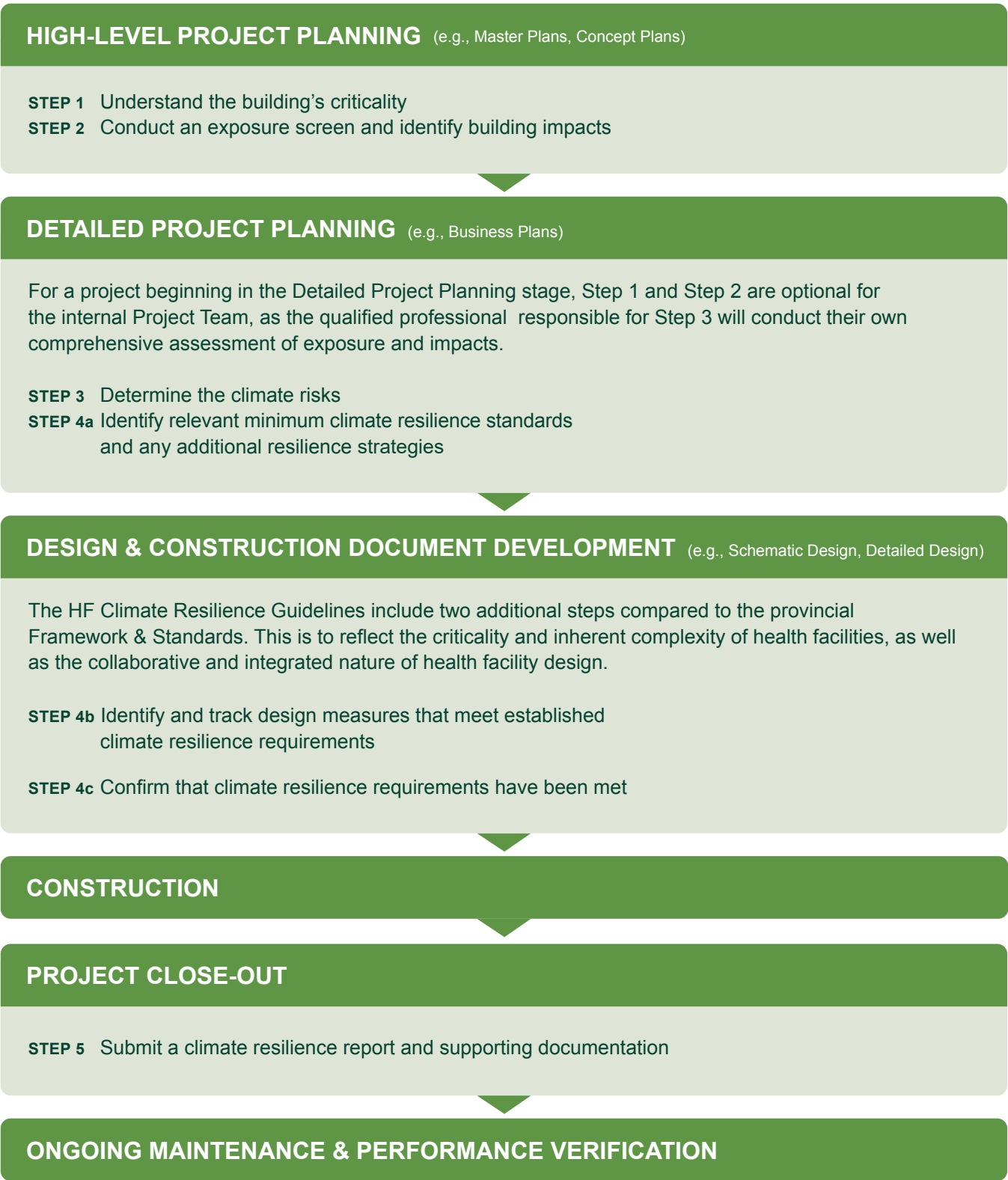
The HF Climate Resilience Guidelines serve a broad audience involved in the design, construction, and management of healthcare infrastructure, including project teams, facility staff, and health system collaborators. They provide comprehensive guidance through various project stages, including high-level project planning, detailed project planning, design and construction document development, and beyond. This process is summarized in **Figure 1** on the next page. The document's flexibility allows for its application across different types of projects and processes, with the ability to customize approaches to meet specific needs and contexts.

Climate resilience planning strongly aligns with key priorities in the health system, helping to advance these priorities while being strengthened by their integration. The following guiding principles should be kept at the forefront of climate resilience efforts for health facility projects:

- Centering Indigenous knowledge, particularly local First Nations' land-based expertise, on health facility projects in a way that strengthens both climate resilience and *reconciliation*.
- Embedding principles of justice, equity, diversity, and inclusion into the design and management of health facilities, recognizing that vulnerability to climate change varies across the population.
- Acknowledging the significance of climate resilience within wider *planetary health* initiatives, based on the understanding that our overall well-being is closely linked to the condition of our environment, encompassing clean air, water, soil, and a stable climate.

By proactively addressing climate risks and integrating sustainability and resilience into healthcare infrastructure projects, BC Health Authorities and their partners can better prepare the health system to face the challenges of climate change, safeguarding the well-being of current and future generations.

**FIGURE 1**  
**Climate resilience planning framework and steps for health facility projects**  
(adapted from: BC Climate Action Secretariat, 2022).





# Acknowledgements

This update to the *Climate Resilience Guidelines for BC Health Facility Planning & Design* (hence referred to as Version 2.0 of the ‘Health Facility (HF) Climate Resilience Guidelines’) was developed for the British Columbia (BC) Health Authorities by representatives from Interior Health, Island Health, Northern Health, and the Energy & Environmental Sustainability (EES) team that serves Fraser Health, Providence Health Care, Provincial Health Services Authority and Vancouver Coastal Health.

This update builds on the success of the original HF Climate Resilience Guidelines that were developed in 2020 by a Health Authority Working Group, an industry Task Force, and an interdisciplinary Advisory Group. It also draws heavily from the *Climate Resilience Framework & Standards for Public Sector Buildings* (hence referred to as the ‘Framework & Standards’), authored by the BC Climate Action Secretariat and released as Version 1.0 in 2022. Please refer to the source documents for more details on contributors.

The content of this document benefited from feedback and meetings with the following groups:

- BC Health Authorities Capital Planning & Project Teams
- BC Health Authorities Energy & Environmental Sustainability Teams
- BC Health Authorities Facilities Management & Operations Teams
- BC Health Authorities Indigenous Health Teams
- BC Health Authorities Planetary Health Teams
- BC Health Authorities Population & Public Health Teams
- Health Emergency Management BC
- Ministry of Environment & Climate Change Strategy, Climate Action Secretariat
- Ministry of Finance, Treasury Board Secretariat
- Ministry of Health, Capital Services Branch
- Ministry of Health, Health System Transformation
- Industry consultants, including reviews by DIALOG, Introba, RDH Building Science, and Stantec



**Left:** New St. Paul's Hospital & Health Campus, Vancouver, Providence Health Care. Architectural rendering courtesy of HDR, subject to change.

**Right:** Yucalta Lodge, Campbell River, Island Health.



# Version Control

This is a living document. Recognizing the evolving landscape of health facility planning and design, the *Climate Resilience Guidelines for BC Health Facility Planning & Design* will evolve as well. Subsequent iterations are anticipated to refine content, reflect industry growth and changes in health service delivery, and incorporate user feedback. The most recent

version will be hosted on the BC GreenCare website at: <https://bcgreencare.ca/resource/hf-climate-resilience-guidelines/>

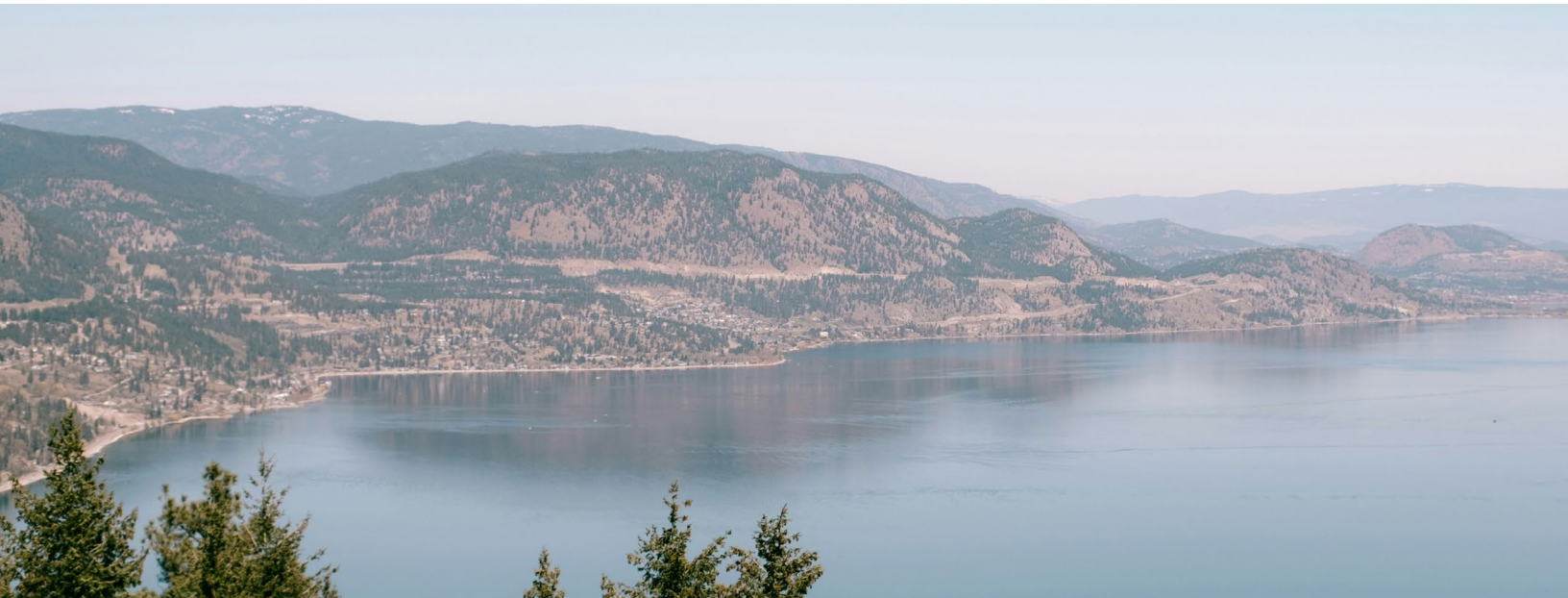
For questions and support, please contact: [info@bcgreencare.ca](mailto:info@bcgreencare.ca)

VERSION	DATE ISSUED	SUMMARY OF UPDATES
v1.0	October 2020	Original release.
v1.1	December 2020	Significant updates to streamline v1.0. The four-step process established in this document was made mandatory through the Health Capital Policy Manual.
v2.0	April 2023	Significant updates to align with release of the provincial <i>Climate Resilience Framework &amp; Standards for Public Sector Buildings</i> .

# Disclaimer

This document is intended to be used for reference and educational purposes only and does not replace or constitute legal advice. The authors make no warranty of any kind, express or implied, with respect to this document. Furthermore, applicable laws, codes, regulations, as well as on-site and project specific conditions, procedures, and circumstances must be considered when applying the information, techniques, and practices described in this document.

The authors of this document are not liable for any errors or omissions and will not under any circumstances be liable for any direct, indirect, special, incidental, consequential, or other loss, injury, or damage caused by its use or otherwise arising in connection with this document, even if specifically advised of the possibility of such loss, injury, or damage.





# How Is This Document Organized?

The *Climate Resilience Guidelines for BC Health Facility Planning & Design* (Version 2.0) is designed to be read alongside the provincial *Climate Resilience Framework & Standards for Public Sector Buildings*, and so chapter numbers are aligned where possible.

- **Chapter 1** provides background on importance of climate resilient health facilities, the policy landscape in British Columbia, who this document is for, and guiding principles for health facility projects.
- **Chapter 2** outlines and discusses the process for incorporating *climate resilience* into health facility projects, including steps consistent with the provincial Framework & Standards, and steps where health projects will need to go above and beyond.
- **Chapter 3** links to the minimum design and retrofit requirements for new and existing public sector organization buildings as outlined in the Framework & Standards and provides commentary on applying the Standards to health facility projects.
- **Appendix A** highlights supporting materials from the Framework & Standards, and links to additional reference documents specific to the health sector.
- Key terms in this document are italicized and their definitions are provided in the **Glossary**, including select entries from the Framework & Standards and items unique to the HF Climate Resilience Guidelines.



Stuart Lake Hospital, Fort St. James, Northern Health.

# Table of Contents

Land Acknowledgement	I
Summary	II
Acknowledgements	IV
Version Control	V
Disclaimer	V
How is This Document Organized?	VI
Table of Contents	VII
<b>1.0 Introduction</b>	<b>1</b>
1.1 Why Build Climate Resilient Health Facilities?	2
1.2 Policy Landscape	4
1.3 Who Is This Document For?	5
1.4 Guiding Principles	6
<b>2.0 Framework for Climate Resilient Health Facilities</b>	<b>9</b>
2.1 High-Level Project Planning	10
2.2 Detailed Project Planning	12
2.3 Design & Construction Document Development	14
2.4 Project Close-Out	16
2.5 Ongoing Maintenance & Performance Verification	17
2.6 Existing Buildings & Minor Projects	18
<b>3.0 Minimum Climate Resilience Standards</b>	<b>19</b>
<b>Glossary of Key Terms</b>	<b>20</b>
<b>Appendix: Supporting Materials</b>	<b>22</b>



# 1.0 Introduction

This update to the *Climate Resilience Guidelines for BC Health Facility Planning & Design* (Version 2.0) signifies a dynamic response to the evolving challenges posed by *climate change*. Originally released in late 2020, the 'HF Climate Resilience Guidelines' have offered practical and adaptable recommendations to bolster the *climate resilience* of healthcare infrastructure in new construction, building additions and major redevelopment projects.

This update highlights the document's status as a living tool, reflecting new insights and better practices. To improve usability for project teams and broaden applicability, the updated version removes references to specific cost thresholds and procurement models, reduces prescriptiveness to reflect a maturing industry, and omits components that were found not to be helpful. The update also reflects the content of the *Climate Resilience Framework & Standards for Public*

*Sector Buildings* (hence referred to as the 'Framework & Standards'), authored by the BC Climate Action Secretariat and released as Version 1.0 in 2022<sup>1</sup>. Because the BC Health Authorities are public sector organizations, the provincial Framework & Standards apply to their owned facilities, including hospitals, long-term care facilities and other buildings. The HF Climate Resilience Guidelines (version 2.0) are intended to read alongside the Framework & Standards when used on a project.

<sup>1</sup> The *Climate Resilience Framework & Standards for Public Sector Buildings* will be implemented through the Province's updated *Environmental, Social & Governance Framework for Capital* (ESGFC). The ESGFC establishes a requirement for taxpayer-supported capital projects to achieve climate resilience and *carbon emissions* reduction goals for the following public sector buildings projects: construction of new or replacement facilities; additions to existing buildings; and major alterations to existing buildings where more than 75% of a building's fundamental components are being replaced.



## 1.1

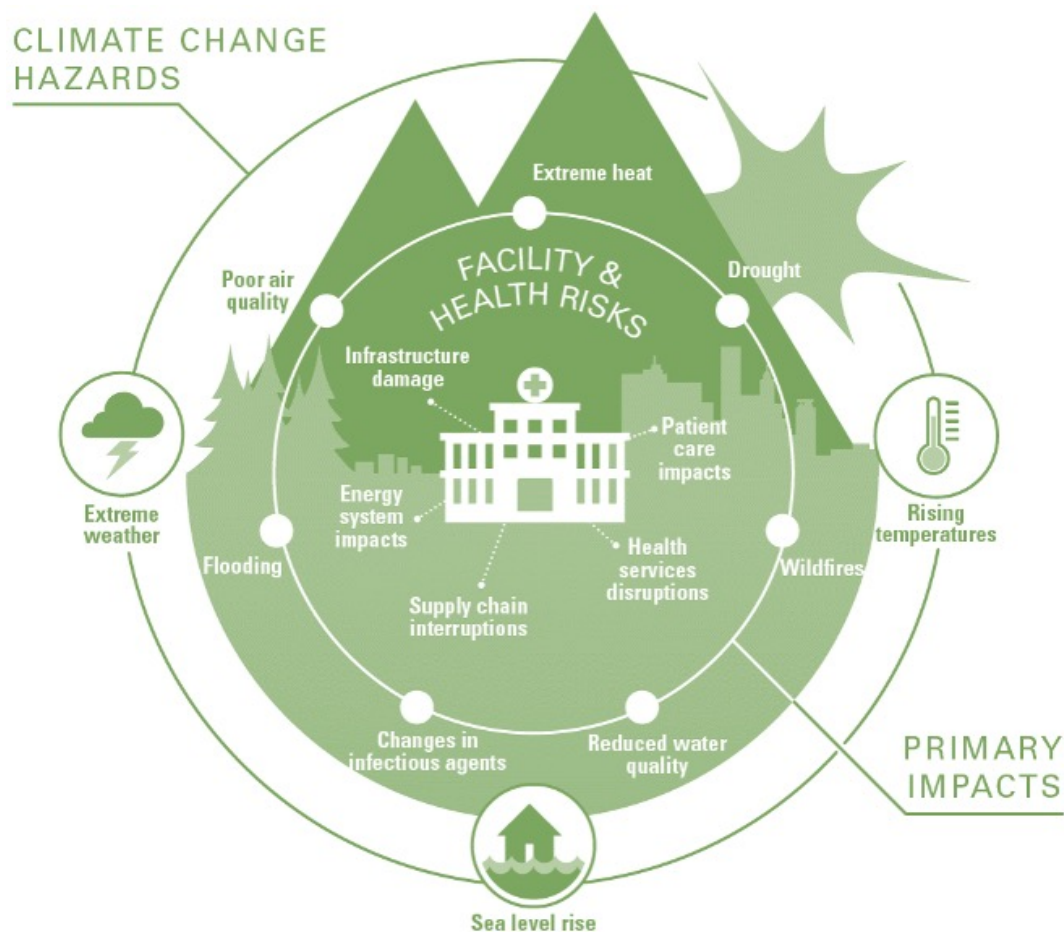
# Why Build Climate Resilient Health Facilities?

*Climate change* presents an urgent and multifaceted challenge spanning various sectors, including healthcare. In recent years, the BC health sector has experienced the undeniable impacts of climate change, manifested in *hazard* events like extreme heatwaves, rampant wildfires, widespread floods, and severe storms. The outcomes of these events can include loss

of life, disruptions in health service delivery, damage to infrastructure, and increased operational costs. In response, it is imperative to design climate resilient health facilities that can anticipate, respond to, cope with, recover from, and adapt to climate-related *shocks* and *stressors* (Figure 2).

**FIGURE 2**

**Climate-related hazards and potential impacts for health facilities**  
(adapted from: BC Climate Action Secretariat and Ministry of Health, 2018).





Ensuring the resilience of health facilities in the face of climate change is necessary for maintaining and improving healthcare service stability and human well-being overall. Given the extended lifespans of health facilities, they will need to withstand evolving climate challenges throughout the 21st century. This requires a proactive and thoughtful approach during the planning and design stages, whereby health facility project teams are equipped to effectively manage *climate risks*. This involves continually assessing impacts on services, building users, and the environment, and weighing intervention costs and benefits, even when information is incomplete. Early efforts to enhance resilience not only reduce immediate *risks* but also establish a solid foundation for enduring resilience over time.

Furthermore, climate resilient health facilities align with broader goals of *sustainability* and *climate action*. As new health facility projects are initiated and existing buildings retrofitted, integrating climate change *mitigation* and *adaptation*, specifically through a *low carbon resilience* lens, becomes paramount. This approach not only minimizes the environmental impact of healthcare operations but also maximizes resilience

to climate-related changes. By embedding low carbon resilience in facility planning and design, we unlock dual benefits for both human well-being and the environment, fostering sustainable healthcare delivery and facilitating the transition to a *low carbon* economy.

In conclusion, building and operating climate resilient health facilities is crucial to maintaining quality healthcare services as the climate continues to change. By proactively addressing climate risks during planning and design, project teams and collaborators can lay the groundwork for effective and enduring healthcare infrastructure that serves the needs of present and future generations.



**Left:** Sechelt | shishálh Hospital, Sechelt, Vancouver Coastal Health.



**Right:** Cowichan Hospital Replacement Project, North Cowichan, Island Health.  
Architectural rendering courtesy of Parkin Architects, subject to change.

# 1.2

## Policy Landscape

In British Columbia, the current policy landscape is strongly oriented towards fostering climate resilient health facilities, emphasizing alignment with climate change strategies and sustainable practices. **Table 1** below identifies key documents relevant to new and replacement health facility projects, with hyperlinks provided where available.

**TABLE 1**  
**Select climate-related policies and plans relevant to new and replacement health facility projects in BC.**

DOCUMENT	YEAR	ISSUER	RESILIENCE CONSIDERATIONS FOR HEALTH FACILITIES
<a href="#">Climate Change Accountability Act</a>	2018	Government of British Columbia	<ul style="list-style-type: none"> <li>Provincial government's commitment to reduce carbon emissions 40%, 60% and 80% by 2030, 2040 and 2050, respectively.</li> <li>Public sector organizations must manage risks reasonably expected to result from climate change.</li> </ul>
<a href="#">CleanBC</a>	2018	Government of British Columbia	<ul style="list-style-type: none"> <li>Provincial government's plan to reduce carbon emissions 40% by 2030.</li> <li>Raises standards for new construction and encourages improvements in existing buildings.</li> </ul>
<a href="#">CleanBC Roadmap to 2030</a>	2021	BC Ministry of Environment & Climate Change Strategy	<ul style="list-style-type: none"> <li>Requires all new public sector buildings to align with performance standards in 2023, moving to zero-carbon new buildings in 2027.</li> <li>Commits to developing a comprehensive strategy to transform existing public sector building portfolio to a low carbon and resilience standard.</li> </ul>
<a href="#">Climate Preparedness &amp; Adaptation Strategy</a>	2022	BC Ministry of Environment & Climate Change Strategy	<ul style="list-style-type: none"> <li>Establishes a goal that public infrastructure throughout the province, including health facilities, is built to withstand climate impacts and extreme weather conditions.</li> <li>Introduces development of new climate resilience design standards for public sector buildings.</li> </ul>
<a href="#">Environmental, Social &amp; Governance Framework for Capital</a>	2022	BC Treasury Board Secretariat	<ul style="list-style-type: none"> <li>Provides guidance to capital ministries and public sector organizations on expectations for climate resilient design and carbon emissions reduction in capital submissions.</li> </ul>
<a href="#">Climate Resilience Framework &amp; Standards for Public Sector Buildings</a>	2022	BC Ministry of Environment & Climate Change Strategy	<ul style="list-style-type: none"> <li>Project teams must follow the Framework to identify and prioritize climate risks and apply the Minimum Climate Resilience Standards to address identified risks.</li> </ul>
<a href="#">Health Authority Mandate Letters</a>	Annual	BC Ministry of Health	<ul style="list-style-type: none"> <li>Provincial government issues annual mandate letter to health authorities to communicate annual direction and confirm mandate and priorities.</li> <li>Health authorities issue three-year service plans, outlining their strategic priorities.</li> </ul>
<a href="#">Health Capital Policy Manual – Chapter 11: Low Carbon, Climate Resilient &amp; Sustainable Health Facilities</a>	2024	BC Ministry of Health	<ul style="list-style-type: none"> <li>Align planning and design of new and replacement health facilities with provincial legislation, strategies and action plans for minimizing carbon emissions, managing climate risks, and improving environmental sustainability.</li> <li>Project teams must follow the provincial Framework &amp; Standards, as well as additional steps in the HF Climate Resilience Guidelines.</li> </ul>



## 1.3

## Who Is This Document For?

The updated *Climate Resilience Guidelines for BC Health Facility Planning & Design* serve as a valuable resource for a broad audience engaged in designing, constructing, and managing healthcare infrastructure. These parties include **project teams, capital planners, facility maintenance and operations staff, energy and environmental sustainability teams, clinicians, consultants, contractors**, and many other health system collaborators.

- **Primary Audience:** The HF Climate Resilience Guidelines are primarily targeted at those who are involved in new and replacement health facility projects within the scope of the *Environmental, Social & Governance Framework for Capital (ESGFC)*, and accordingly the *Climate Resilience Framework & Standards for Public Sector Buildings*. This document offers guidance to ensure compliance with climate resilience requirements while minimizing *carbon emissions*.

- **Project Phasing and Procurement:** The HF Climate Resilience Guidelines are intended to be utilized through various project stages, in conjunction with the provincial Framework & Standards. They inform high-level project planning, successive design iterations, construction, and post-occupancy stages.
- **Flexibility and Transferability:** Designed to be adaptable, the HF Climate Resilience Guidelines can be applied across different types of projects and processes across the health system, even when not explicitly required (e.g., leased facilities). They can be applied regardless of the procurement strategy or project delivery model, with the understanding that some customization may be necessary. Their flexibility enables different project teams to incorporate climate resilience strategies that align with their unique needs and timelines, including minor retrofits and different facility types.



**Left:** BC Cancer – Victoria, Victoria, Provincial Health Services Authority.



**Right:** Cariboo Memorial Hospital Redevelopment, Williams Lake, Interior Health. Architectural rendering courtesy of Stantec, subject to change.

## Collaborating With Indigenous Peoples

Indigenous Peoples, as the original stewards of what is now Canada, have an enduring relationship with the environment that has shaped their cultures since time immemorial. However, colonization disrupted these practices, forcibly displacing and disconnecting Indigenous communities from their traditional territories using colonial, genocidal policies that favoured settlers' exploitation of the natural world. This exploitation is a significant contributor to climate change.

The climate crisis compounds injustices and inequities already faced by Indigenous Peoples, resulting from centuries of colonialism and systemic racism. Policies in Canada and British Columbia now reflect a commitment to *reconciliation*, guided by evidence-based recommendations outlined in national and international reports such as the [\*United Nations Declaration on the Rights of Indigenous Peoples \(UNDRIP\)\*](#), the [\*Declaration on the Rights of Indigenous Peoples Act\*](#) passed in BC, and the National Truth & Reconciliation Commission's (TRC) [\*Calls to Action\*](#). These commitments affirm the inherent Title and Rights of Indigenous communities and recognize them as critical leaders and partners in climate planning and response.

Indigenous communities have been and continue leading climate action efforts, integrating *Indigenous Traditional Ecological Knowledge* (ITEK) and practices. A few examples of many include:

- [\*The BC First Nations Climate Strategy & Action Plan\*](#) developed by the First Nations Leadership Council (FNLC).
- The səlililwətaʔt (Tsleil-Waututh) Nation's [\*Climate Change & Community Health Action Plan\*](#), which integrates traditional knowledge for community resilience.

Climate resilience planning strongly aligns with key priorities in the health system, helping to advance these priorities while being strengthened by their integration. The following guiding principles should be kept at the forefront of climate resilience efforts for health facility projects.

- Hałtzaqv (Heiltsuk) Nation's sustainable energy transition through their [\*Community Energy Plan\*](#).
- Leading efforts by T'eqt'aqtn'mux (Kanakas Bar Band) to develop a community [\*Climate Change Vulnerability Assessment\*](#).

When designing climate resilient health facilities, it is crucial to listen to Indigenous Peoples, include First Nations leaders as decision-makers on projects, and respect and uphold local protocols in First Nations territories. This involves acknowledging traditional territories and building relationships with Indigenous communities, respecting First Nations' sovereignties, and valuing ITEK as parallel and complementary to Western scientific methods. Design outcomes will vary but may include mechanical filtration systems that account for both smudging ceremonies and wildfire smoke, as well as culturally significant spaces that can double as shelters during extreme weather events. Project teams should connect with their respective Indigenous Health teams at the project's outset to ensure alignment with organizational protocols and processes.

Embracing partnership with Indigenous Peoples presents a significant opportunity to bolster health facilities' resilience to climate change while promoting reconciliation. This approach acknowledges the invaluable contributions of Indigenous knowledge to sustainability and enhances the healthcare system's capacity to serve all communities equitably.

## Health Equity

In the face of climate change, the planning and management of health facilities demands a commitment to justice, equity, diversity, and inclusion. *Health equity* means striving for all individuals to reach their full health potential without being disadvantaged by socio-economic status, race, gender, or other social determinants of health. Recognizing that vulnerability to climate change is unevenly distributed across the population is crucial. By prioritizing health equity, project teams can help facilities meet the diverse needs of the communities they serve and foster resilience through inclusivity.

In British Columbia and beyond, noteworthy progress is being made in weaving health equity into climate resilience efforts:

- The [\*Global Diversity, Equity & Inclusion Benchmarks\*](#) (GDEIB) assist in managing progress towards diversity and fostering inclusion while showing the linkage between equity, diversity, inclusion, and sustainability.
- The national [\*Health of Canadians in a Changing Climate\*](#) report assesses climate change's health impacts and identifies adaptation strategies for healthcare systems, highlighting the needs of vulnerable populations.

- The 2023 [\*Chief Medical Health Officer Report\*](#) from Vancouver Coastal Health identifies urgent climate-related health harms and documents collaborative mitigation and adaptation efforts within the region.
- Projects like the [\*community health and climate change maps\*](#), developed by Vancouver Coastal Health and Fraser Health in collaboration with the University of British Columbia, analyze community vulnerabilities to climate hazards, guiding efforts to strengthen resilience.

Health equity can blend with climate resilience in hospital design through adaptive and inclusive approaches. Solutions will differ by project and community, so it is recommended that project teams engage with Population Health staff to tailor approaches. Potential measures might include:

- Engaging with different population segments to understand their unique vulnerabilities so that health facilities can support the broader community.
- Establishing areas within health facilities as safe havens during extreme weather, offering relief to vulnerable populations.
- Improving indoor air filtration against wildfire smoke and supporting community-based air quality monitoring, especially in rural and remote areas.



**Left:** St. Vincent's Heather, Vancouver, Providence Health Care. Architectural rendering courtesy of dys architecture, subject to change.



**Right:** Royal Inland Hospital, Kamloops, Interior Health. Architectural rendering courtesy of Kasian.



## Planetary Health

*Planetary health*, a term first introduced by the [Lancet Countdown](#), emphasizes the deep connection between the health of human populations and the state of the Earth's natural systems. Indigenous Peoples have worked to steward the land since time immemorial, understanding it to be “a source of identity, healing, health and wellness”<sup>2</sup>. A planetary health approach is a commitment to joining this stewardship. It is based on the understanding that our well-being is closely linked to the quality of our environment, including clean air, water, soil, and a stable climate. The concept underscores that climate change poses one of the greatest health challenges of our time by threatening these essential elements. Addressing this crisis offers an opportunity not only to mitigate environmental harm but also to enhance public health.

Integrating planetary health into the healthcare sector is gaining momentum in British Columbia and globally. These efforts reflect a broader understanding that a healthy planet is foundational to human health and that the health system has a pivotal role to play in this arena. Notable examples include:

- Fraser Health has made planetary health a strategic priority, launching a comprehensive [Planetary Health Strategy](#) and forming a Planetary Health Steering Committee.

- Interior Health has released a [Climate Change & Sustainability Roadmap](#), charting a path toward sustainability in healthcare provision.
- PHSA has identified planetary health as one of its six [North Star priorities](#).
- Vancouver Coastal Health has established planetary health as a [core pillar](#) of its operations.

Incorporating climate resilience as a vital component of planetary health into health facility design requires innovative and adaptable strategies. Such measures might include low carbon construction methods, more energy efficient systems, and the therapeutic integration of natural elements into healthcare settings. Project teams should understand who at their organization is working on planetary health and brainstorm early in the planning and design process. By aligning project plans with organizational commitments to low carbon resilience and *environmental sustainability*, health facilities can play a crucial role in advancing this important topic.

<sup>2</sup> Stelkia, K., Beck, L., Manshadi, A., Jensen Fisk, A., Adams, E., Browne, A. J., Dixon, C., McEachern, D., Ritchie, W., McDonald, S., Henry, B., Marsden, N., Behn-Smith, D., & Reading, J. (2020). Letsemot, “Togetherness”: Exploring how connection to land, water, and territory influences health and wellness with First Nations Knowledge Keepers and youth in the Fraser Salish region of British Columbia. *International Journal of Indigenous Health*, 16(2).





# 2.0 Framework for Climate Resilient Health Facilities

Version 2.0 of the *Climate Resilience Guidelines for BC Health Facility Planning & Design* is intended to streamline the resilience planning process for health facility projects, aligning with the Province's *Climate Resilience Framework & Standards for Public Sector Buildings*. As public sector organizations, health authorities are mandated to follow the Framework & Standards. This update shows how key steps from the Framework & Standards are applicable to new and replacement health facility projects.

Additionally, two tailored steps for health facility projects are included, reflecting the inherent complexity of health facilities while integrating with existing workflows. Version 2.0 introduces new information only where necessary, relying on references to the provincial Framework & Standards to ensure a cohesive and unified approach.



2.1

# High-Level Project Planning

Within the health system, the high-level project planning stage involves both clinical and facilities studies that explore how short-, medium-, and long-term service growth will be accommodated. This section includes two steps intended to understand how the local climate resilience context might affect

these studies. Site specific environmental factors and critical infrastructure considerations are identified at this time. This stage also presents a chance to assess community resilience to *climate impacts*, which influences health service demand across sites, service areas, and systems.

## STEP 1: Understand the building’s criticality

Input	Project details
Outputs	Criticality classification of the building
Completed by	Internal Project Team

As one of the first steps of the Framework & Standards, the internal Project Team must determine the criticality of the health facility to its occupants, the organization, the community and the health system.

There are four possible Criticality Classifications, which have been adapted from the National Building Code of Canada’s ‘Importance Categories’, including: Post-disaster, High, Normal and Low. The internal Project Team is directed to Section 2.1 and Table 2 of the Framework & Standards for guidance.

Note that importance categories were developed primarily for identifying the loads a building’s structural system need to be designed for. In

the Framework & Standards, the application differs slightly and the ‘criticality classification’ of a building is used to determine what *climate resilience measures* need to be applied to all building systems (e.g., mechanical, electrical, plumbing, structural).

The Framework & Standards also specify that public sector organizations may elect to classify their buildings with higher criticality than indicated in the table. Given the significance of health facilities to the populations they serve, it is possible that many buildings will be classified as either high or post-disaster criticality. The internal Project Team should verify whether the Health Authority has already assigned a criticality classification to the health facility in question.



## STEP 2: Conduct an exposure screen and identify building impacts

<b>Input</b>	Project details (location, design, site layout)
<b>Outputs</b>	A list of climate-related hazards relevant to the project site, and list of possible impacts on the building as a result
<b>Completed by</b>	Internal Project Team and/or external consultants

The internal Project Team, or a consultant working on its behalf, will complete a *climate hazard exposure screen*. This is the identification of climate-related hazards that are relevant to the project site. The exposure (degree to which a building is exposed to climate hazard) depends on the facility's location, site layout, and design.

Before undertaking this step, the internal Project Team should verify whether the Health Authority has already completed a climate hazard exposure screen for the health facility site in question. If

so, outcomes should be sourced and validated to be up-to-date and using the best available information, including the latest *climate projections* from the Intergovernmental Panel on Climate Change (IPCC). The internal Project Team and/or consultant are directed to Section 2.1 and Table 3 of the Framework & Standards for additional guidance.



2.2

# Detailed Project Planning

This section offers guidance for projects that have progressed beyond the initial high-level planning stage and are likely pursuing a business plan. The outlined steps translate general information about climate-related hazards and potential impacts into project-

specific risks, which are then ranked and prioritized for risk reduction through planning and design. For a health facility project beginning in the detailed project planning stage, the previous steps can be completed by the qualified professional as part of Step 3.

## STEP 3: Determine the climate risks

Input	Project details, building details
Outputs	List of medium to high risks (with associated risk scores), and any special risk cases
Completed by	A qualified professional consultant (e.g., a licensed professional engineer and/or climate specialist)

A *climate risk assessment* is an essential tool for achieving climate resilience in building projects. A climate risk assessment is important for establishing the *likelihood* of a given hazard impacting a building or a building component combined with the *consequence* should the impact occur.

The internal Project Team will hire a qualified professional consultant (e.g., a licensed professional engineer or a climate specialist) to perform the assessment, including engagement with a variety of interest holders. Consultants

should confirm with the Health Authority regarding preferred climate risk assessment tools and approaches. The consultant is directed to Section 2.2 and Appendix C of the Framework & Standards for additional guidance on completing the climate risk assessment. It is possible that one of the conclusions of the climate risk assessment is that a more detailed engineering analysis is required for certain topics at later stages of design.

## STEP 4a: Identify relevant minimum climate resilience standards and any additional resilience strategies

<b>Input</b>	List of medium to high risks keyed to major systems/components, and any special risk cases
<b>Outputs</b>	Relevant sections and clauses from the Standards
<b>Completed by</b>	Internal Project Team, Design Team and/or external consultants

The objective of this step is to identify opportunities and strategies for improving the climate resilience of the new or replacement health facility.

This step involves identifying which sections of the Standards are applicable to the project (see Chapter 3 of both this document and the Framework & Standards). The Standards outline minimum climate resilient design and performance requirements for public sector organization projects across all building types, including new construction and major alterations to existing buildings.

The internal Project Team, Design Team and consultants are directed to Section 2.2 and Section 3.1 of the Framework & Standards for additional guidance on identifying relevant minimum climate resilience requirements for the project. It may be appropriate to go above and beyond these minimums, depending on the findings of the climate risk assessment, other applicable codes and standards, and the specific needs of the project. At this point, it is also essential to estimate costs to include climate resilience measures in business planning, as well as to identify funding that may support implementation.



**Left:** Hope Centre Family Support, North Vancouver, Vancouver Coastal Health.



**Right:** Burnaby Hospital Redevelopment Project – Phase II, Burnaby, Fraser Health. Architectural rendering courtesy of DIALOG. Subject to change.



2.3

# Design & Construction Document Development

This section provides guidance for the design and construction document development stage of health facility projects. Notably, the HF Climate Resilience Guidelines include two additional steps compared to the Framework & Standards: the resilient design review and resilience audit. This is to reflect the criticality and inherent complexity of health facilities, as well as the collaborative and integrated nature of health facility design.

These two steps promote thorough identification and tracking of climate resilience measures and include a final check to ensure that relevant minimum climate resilience requirements have been met.

## STEP 4b: Identify and track design measures that meet established climate resilience requirements

Input	List of medium to high risks and identified climate resilience requirements, including minimum requirements from the Standards and project-specific requirements
Outputs	Tracking mechanism to be used for ongoing documentation of how design disciplines intend to meet identified climate resilience requirements, accompanied by narrative reports at key design milestones
Completed by	Internal Project Team, Design Team and/or external consultants

Step 4b, called the ‘resilient design review’, aims to identify and monitor design measures that meet established climate resilience requirements, including all ‘must’ requirements. It ensures that prioritized *climate impacts* are reflected in health facility design and construction documents.

The internal Project Team, Design Team and consultants are directed to establish and populate

a tracking mechanism (e.g., Excel spreadsheet) to log climate hazards, potential impacts, risk scores, selected resilience requirements, and responsible parties. Narrative reports summarizing the outcomes should be submitted at key design milestones (e.g., 50%, 70%, 90%).

## STEP 4c: Confirm that climate resilience requirements have been met

<b>Input</b>	Information from design disciplines that outlines how climate resilience requirements have been met
<b>Outputs</b>	Completed tracking mechanism and narrative report showing compliance with identified climate resilience requirements
<b>Completed by</b>	Internal Project Team, Design Team and/or external consultants

Step 4c, called the 'compliance audit' in v1.0 and renamed 'resilience audit' in v2.0, verifies the design's effective reduction of climate risks, incorporation of climate resilience measures, and adherence to established climate resilience requirements. It also validates any equal-or-better alternatives.

The internal Project Team, Design Team and consultants are directed to:

- Collaborate across design disciplines to document how climate resilience requirements

have been met, documenting relevant clauses, evidence, responsible parties, and updates through design stages.

- Summarize outcomes in a tracking mechanism (e.g., Excel spreadsheet) and narrative report.
- Reference supporting documents and technical resources for informed decision-making when requirements cannot be fulfilled, or changes are necessary.





2.4

Project  
Close-Out

Engaging in the climate resilience planning process is crucial for managing climate risk in individual health facility projects. Additionally, sharing insights and lessons learned from this experience is essential for enhancing climate resilience at a broader scale. By reporting findings, project teams contribute valuable knowledge that can benefit other projects and strengthen our collective ability to address climate-related challenges.

STEP 5: Submit a climate resilience report and supporting documentation

Input	Results from High-Level Project Planning Results from Detailed Project Planning Results from Design & Construction Document Development
Outputs	Climate resilience report and supporting documentation
Completed by	Internal Project Team, Design Team and/or external consultants

A final ‘climate resilience report’ is to be submitted to the Health Authority and the BC Climate Action Secretariat at the completion of the project.

The internal Project Team, Design Team and consultants are directed to Section 2.4 of the Framework & Standards for guidance on the

minimum elements that the report should include. Note that the Health Authority may request additional reporting elements, including but not limited to the items detailed in Step 4b and Step 4c of the HF Climate Resilience Guidelines, as well as lessons learned for future health facility projects.





## 2.5

## Ongoing Maintenance & Performance Verification

To effectively realize the intentions of the *Climate Resilience Guidelines for BC Health Facility Planning & Design*, continuous maintenance, monitoring, and performance verification (M&V) are essential. For example, mechanical systems need regular upkeep, while building envelope systems require practices like resealing windows. Such maintenance improves longevity and minimizes climate-related risks. Monitoring building performance helps maintain functionality amidst evolving climate conditions. Regular observations enable timely adaptations,

safeguarding against risks and informing future improvements.

The content of the HF Climate Resilience Guidelines and the provincial Framework & Standards can be considered when developing an M&V plan for health facility projects. The topic of how to improve climate resilience through M&V may be explored in future iterations of the HF Climate Resilience Guidelines.





## 2.6

## Existing Buildings & Minor Projects

Retrofitting existing health facilities for climate resilience is a sizable task, potentially more complex than designing new structures that have inherent resistance to climate-related hazards from opening day. Despite the challenges, retrofits offer a significant opportunity to adapt to present and future hazards, through both minor upgrades and extensive renovations (e.g., replacing building envelopes, elevating first floors above floodplains). Health authorities already invest substantial resources in asset maintenance and improvement, creating avenues for integrating resilience retrofits. Simultaneously, ongoing and annual maintenance efforts can yield substantial resilience returns.

While the HF Climate Resilience Guidelines focus primarily on new and replacement construction projects, the Framework & Standards include a set

of minimum climate resilience standards specifically intended for retrofits, which account for the practical limitations often faced at existing buildings compared to new construction. Per the *Environmental, Social & Governance Framework for Capital*, these minimum standards apply to additions to existing buildings, and major alterations to existing buildings where more than 75% of a building's fundamental components are being replaced (e.g., structural components, major systems, and/or building envelope). On health facility retrofit projects where the ESGFC does not apply, the minimum standards can still serve as a summary of climate resilience measures that are strongly advised. While resilience planning for existing buildings should be comprehensive, its implementation can be phased incrementally, aligning with short-, medium-, and long-term strategies to make the process more manageable and financially feasible.



**Left:** Jim Pattison Outpatient Care & Surgery Centre, Surrey, Fraser Health.



**Right:** BC Cancer – Prince George (Centre for the North), Prince George, Provincial Health Services Authority.

## 3.0 Minimum Climate Resilience Standards

The Framework & Standards introduce the Minimum Climate Resilience Standards (the 'Standards') for public sector buildings, including considerations for both new construction and existing buildings. Project teams, design teams, and consultants are directed to **Section 3.1** and **Section 3.2** of the Framework & Standards for additional guidance on identifying relevant clauses for health facility projects.

In the Standards, 'must' signifies a requirement, compelling projects to meet the provision; 'should' indicates a strong recommendation but not an obligation; and 'may' offers an optional choice.

Note that the Standards were developed to cover a wide range of public sector building types. Current best practices in health facility design are generally expected to meet or exceed 'must' requirements, but this needs to be confirmed on a project-by-project basis. There may also be climate resilience measures that are important to health facilities that are not covered in the Standards. With this in mind, the Standards establish a foundation for climate resilience measures to be further explored and refined during the Design & Construction Document Development stages based on the unique needs of the health facility project.





# Glossary of Key Terms

**Adaptation:** In the context of climate change, the process of adjusting to the current impacts of climate change and preparing for ongoing climate-related shocks, disruptions, and trends.

**Carbon emissions:** The release of carbon dioxide (CO<sub>2</sub>) and other carbon compounds into the atmosphere, primarily as a result of human activities such as fossil fuel burning and deforestation.

**Climate action:** Initiatives and measures undertaken to combat climate change and its impacts, including mitigation and adaptation strategies.

**Climate change:** A long-term change in the state of the climate that is attributed directly or indirectly to human activity and alters the composition of the global atmosphere. Climate change is in addition to natural climate variability observed over comparable time periods (typically, decades or longer).

**Climate hazard:** A potential event or physical condition that can cause loss of life, injury, property damage, socio-economic disruption, or environmental degradation as a result of climate change.

**Climate hazard exposure screen:** A tool or methodology used to identify and assess the exposure of communities, sectors, or assets to specific climate-related hazards.

**Climate impacts:** The effects of climate change on natural and human systems, ranging from physical, ecological, and socio-economic consequences.

**Climate projections:** Scientific estimates about the future state of the climate based on different scenarios of carbon emissions, using climate models.

**Climate resilience:** The capacity to prepare for, withstand, recover, and grow from climate-related stressors, shocks, and disruptions.

**Climate resilience measures:** Strategies and practices incorporated into the planning, design, and operation of infrastructure and communities to improve their resilience to climate change and other stresses.

**Climate risk:** 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.

**Climate risk assessment:** The process of evaluating the potential likelihoods and consequences of climate change impacts for specific sectors, regions, or systems.

**Climate shocks:** Extreme climate events or sudden disruptions to systems caused by climate change, such as hurricanes, floods, and heatwaves.

**Climate stressors:** Long-term trends or persistent conditions that may strain systems or sectors, such as gradual temperature increases, sea-level rise, or increasing water scarcity.

**Consequence:** In the context of climate resilience planning, the outcome or result of a climate impact, affecting natural and human systems.

**Environmental sustainability:** Responsible interactions with the environment to avoid depletion or degradation of natural resources and allow for long-term environmental quality and even regeneration.

**Health equity:** The absence of unfair systems and policies that cause health inequalities. The reduction of inequalities and increase in access to opportunities and conditions conducive to health for all.

**Indigenous Traditional Ecological Knowledge (ITEK):** A holistic and longitudinal approach to understanding the health of Indigenous Peoples, ecosystems, and the environment—an approach that integrates ecological, social, empirical, and spiritual knowledge. It comprises local Nation-specific and land-based knowledge, traditions, histories, and protocols.

**Likelihood:** In the context of climate resilience planning, the probability of occurrence of specific climate change impacts within a particular time period.

**Low carbon:** Options that are associated with lower carbon emissions than the conventional option.

**Low carbon resilience:** An approach that integrates climate change mitigation (reducing carbon emissions) and adaptation (adjusting to climate impacts) strategies to enhance sustainability and resilience.

**Planetary health:** The interdependent relationship between the health of our communities and the health of the environment.

**Mitigation:** In the context of climate change, actions to reduce or prevent carbon emissions, aiming to limit the magnitude and rate of long-term climate change.

**Reconciliation:** Building a renewed relationship with Indigenous Peoples based on the recognition of rights, respect and partnership. Reconciliation is an ongoing process, not a destination.

**Risks:** The potential for adverse consequences where something of value (including natural and human systems) is at stake and where the outcome is uncertain, recognizing the diversity of values. In the context of climate resilience planning, risk is typically a function of likelihood multiplied by consequence.

**Sustainability:** Meeting the needs of the present without compromising the ability of future generations to meet their own needs, often focusing on environmental, economic, and social dimensions.





# Appendices





# About These Appendices

Refer to the following sections in the *Climate Resilience Framework & Standards for Public Sector Buildings* for more information:

- **Appendix A:** Climate Change Fundamentals, Climate Modeling, Climate Projections for British Columbia, and Design Parameters
- **Appendix B:** 'Climate-Projected' Design Parameters
- **Appendix C:** Background on Climate Risk Assessments and Existing Risk Assessment Frameworks



## Resources

The following resources may also prove useful when planning and designing climate resilient health facilities:

- [CASCADES. \(2022\). \*Organizational Readiness for Sustainability Playbook\*.](#)
- [Canadian Standards Association. \(2018\). \*CSA Z8000-18: Canadian Health Care Facilities\*.](#)
- [Energy & Environmental Sustainability. \(2024\). \*Low Carbon Resilience & Environmental Sustainability Guidelines for Health Care New Construction\*.](#)
- [Health Canada. \(2022\). \*Health of Canadians in a Changing Climate\*.](#)
- [Vancouver Coastal Health, Fraser Health & Health Emergency Management BC. \(2022\). \*HealthADAPT: Climate Change & Health Adaptation Framework\*.](#)
- [World Health Organization. \(2020\). \*WHO Guidance for Climate Resilient & Environmentally Sustainable Health Care Facilities\*.](#)
- [World Health Organization. \(2023\). \*Operational Framework for Building Climate Resilient & Low Carbon Health Systems\*.](#)

