

NANAIMO HOSPITAL BUILDS RESILIENCY INTO NEW EMERGENCY DEPARTMENT

Nanaimo Regional General Hospital responded to future climate uncertainty by designing resiliency into its new building's fabric.

INTRODUCTION

A growing number of Canada's health care organisations are seeing first-hand the impacts climate change is having on their facilities and are responding accordingly to ensure their infrastructure is as robust and capable as possible to withstand events such as floods, ice storms, and heat waves that can compromise access to critical resources, the delivery of care, and the safety of patients, staff and visitors.

The Nanaimo Regional General Hospital (NRGH), a 247-bed facility that opened in 2012, responded to future climate uncertainty by designing resiliency into its building's fabric. Serving more than 160,000 people on Central Vancouver Island, and referral centre for some 400,000 additional residents on, NRGH has incorporated a number of measures that help mitigate risk in the event of an extreme weather incident when it constructed its 6,200 m² Emergency Department addition.



The Nanaimo Regional General Hospital employs extensive use of day lighting and natural light which helps decrease reliance on electricity, improves patient outcomes and reduces staff stress.

The building energy performance index (BEPI) is 524 kWh/m²/yr and an annual savings of 939 GJ gas; 1,071,892 kWh electricity and a 39 kW demand reduction for a total annual savings of \$59,815.

DESIGN FOR RESILIENCE

To reduce energy consumption and GHG emissions, the building's designers incorporated the use of displacement ventilation, wood products with lower associated GHG emissions, extra roof insulation, solar shading, and digital controls.

The building's dedicated heat recovery chiller, complete with a subterranean labyrinth for heat storage, provides preheat for the domestic hot water and heating when required by exterior zones. One hundred percent redundancy is provided by the main hospital's existing heating plant.

Design and technology is in accordance with LEED Gold and the BC Hydro New Construction Standard.

During the daylight hours, the majority of the building operates with very little artificial light in comparison to the old Emergency Department, which was completely devoid of natural light. The use of courtyards assist in maximizing the amount of natural light brought into patient and staff areas. Even the trauma room benefits from natural lighting and throughout the building operable windows allow for natural ventilation.

High tech blinds self-adjust throughout the day, automatically lowering or rising, and opening or closing as conditions demand.

Thanks to the design of the negative pressure isolation rooms and decontamination space, infection control has also been improved, particularly when handling patients believed to have infectious airborne diseases.

The conservation of water has been assisted by the installation of low-flow water fixtures, natural landscaping and a storm water retention system.

Most recently, with resiliency and redundancy in mind, construction has been completed on the Water Supply Building. Rather than a single service feed from the municipal infrastructure to the hospital's ring water supply main, NRGH is now serviced by two independent municipal water systems complete with parallel water meters, backflow preventers, new filtering and interconnecting valves so service to the hospital can be maintained while components are being serviced. The filtration was added to better accommodate increased turbidity levels occasionally found in the areas reservoir.



A subterranean labyrinth of heat storage vessels forms part of the hospital's energy-efficient HVAC system.



NRGH is now serviced by two independent municipal water systems to enhance resiliency. Parallel meters and valves, backflow valves and enhanced filtering are contained in the new Water Supply Building. A bank of frosted windows usher natural light into the area.

FEATURES RECAP

- LEED Gold certified
- Solar shading
- Subterranean labyrinth (heat storage)
- Low-flow water fixtures
- Storm water retention system
- Occupancy sensors (lighting)
- Dedicated heat recovery chiller
- Extensive daylight harvesting in all patient rooms and quadrants with offset dimming lighting
- Operable windows to allow displacement ventilation
- Automated window coverings
- Electric dimming glass doors to all patient rooms offer privacy and improved infection control
- Multiple courtyard gardens with natural light, fresh air and a relaxing environment to promote improved staff and patient wellbeing
- Courtyards include landscape lighting for night enjoyment
- Dual municipal water supplies and backflow preventers
- Enhanced water filtering

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CCGHC-RP-02E, Feb 19, 2015

Thank you to Deanna Fourt and Dave Neufeld for photographs and technical input in developing this profile.

This project made possible by financial support from Health Canada.