

CANADA

Standards Council of Canada (SCC)

Fighting floods in Canada's North

Overview

Flooding is a huge challenge across Canada, where it has emerged in the last decade as the costliest disaster due to extreme weather. That is no different in the North, where flooding, brought on by climate-fuelled extreme weather, can impose high costs on small communities. Community leaders and their insurers are looking for ways to avoid disaster and make their communities safer and more resilient in the face of battering storms.

In 2011, in partnership with CIRNAC, the Standards Council of Canada (SCC) launched the Northern Infrastructure Standardization Initiative (NISI) to respond to the urgent impacts of climate change on buildings and infrastructure in Canada's North. Over five years, this programme facilitated the development of five new Canadian national standards including CSA S503 on community drainage in northern territories.

Building on the success of NISI, SCC launched the Standards to Support Resilience in Infrastructure Program in 2016. This broadened the scope of SCC's climate change adaptation activities to all of Canada. Northern communities remained an area of focus, with a stream of work dedicated as "NISI Phase II". This included new editions of standards developed under Phase I, to reflect lessons learned from the first five years of use and the latest climate data and adaptation practices.

For all the standards activities funded under the umbrella of NISI, topic selection was guided by the Northern Advisory Committee (NAC). The NAC is composed of representatives from the Northwest Territories – Nunavut, Yukon and Nunavik – as well as representation from CIRNAC. Given their experience and technical knowledge of the unique issues facing northern infrastructure and buildings, the NAC proposes topic areas for standardization and uses a consensus-based prioritization framework to rank and select project topics. The NAC has also championed the standards produced to date among northern communities, identifying opportunities for training, uptake and integration of standards into policy and other requirements.

Outcomes and benefits

Supporting efforts to create safer, more resilient communities is at the heart of CSA S503. This SCC-supported standard lays out the essentials for ensuring a community's drainage systems are up to the task, specifying minimum planning, design and maintenance requirements and considering the unique needs of northern communities. Drainage planning is widely recognized as a primary means of community climate change adaptation because flooding can cause damage to roads and buildings and deteriorate the stability of permafrost. Flooding results in the need for increased maintenance, which affects operating budgets and compromises the safety of the community. By following this standard, communities can improve their ability to manage existing drainage challenges, address existing deficiencies, and prepare for future weather events.

Since this standard was first published in 2015 (and updated in 2020), it has been implemented in numerous communities across Nunavut, including Clyde River, Kugluktuk, Cape Dorset, Hall Beach, and Rankin Inlet.

“We are currently tackling drainage planning in multiple communities across Nunavut. Drainage planning is of utmost importance for community climate change adaptation in the North because it protects buildings and infrastructure by improving the stability of underground permafrost, thereby reducing the risk of soil sinking, and by reducing the costly impacts of intense floods during the annual spring melt and during summer storms. Having this standard means we can be certain that projects carried out by different suppliers at different sites – often separated by great distances – will all meet a similar standard. That gives us greater peace of mind that we are doing everything we can to keep our communities as safe as we can from the threat of climate change.”

– William Patch (Manager, Community Planning, Government of Nunavut)

The standard provides a go-to reference for governments in Canada's North that can be incorporated into policy and regulation. It is referenced by the Société d'habitation du Québec's *Housing Construction in Nunavik – Guide to Good Practices*, by the government of Nunavut's *Good Building Practices – Guidelines*, and by the government of the Northwest Territories' *Good Building Practice*. These design guides supplement the national building codes and represent progress towards mandating the use of the voluntary standard, leading to reductions in flood risks for northern communities.

Partners involved

Requesting organizations:

- Standards Council of Canada (SCC)
- Crown Indigenous Relations and Northern Affairs (CIRNAC)

Supporting organizations:

- Representatives from the Northwest Territories – Nunavut, Yukon and Nunavik

Timeline

Development of CSA S503, *Community drainage system planning, design, and maintenance in northern communities*, began in October 2012 and the first edition was published in January 2015. A second edition was later developed, beginning in March 2019, and was published in November 2020, superseding the first.

References

- [CSA S503:20](#), *Community drainage system planning, design, and maintenance in northern communities*
- [SCC NISI 100 Guides](#)
- SCC, *Standards in Action: Building a Climate Resilient Future (report)*, 2021
- SCC, *Standards to Support Climate Resilience in Infrastructure: Taking stock and mapping the future, Interim Report 2016-2019*, 2019
- SCC, [Library of climate resources](#), Canadian Centre for Climate Services, Environment and Climate Change Canada
- Société d'habitation du Québec, [Housing Construction in Nunavik – Guide to Good Practices](#)
- Government of Nunavut, [Good Building Practices – Guidelines](#)
- Government of the Northwest Territories, [Good Building Practice](#)