

Standards Development for Northern Climates

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Issues Identified by Northerners

- Northern specific standards
- Participation of Northerners in the standards development process
- Confidence that standards can be applied in a Northern context
- Access to standards
- Appreciation of constraints unique to the North:
 - remote communities, access to materials and experts
- Appropriate, targeted language for identified end-users

Northern Infrastructure Standardization Initiative (NISI)

SCC leads NISI with support from INAC

Answering
the call from
Northerners
for
assistance
to adapt to a
changing
climate

(2011 -2016) - \$3.5 million program funded under
the Clean Air Agenda

The main objectives of NISI include:

- Establish a Northern Advisory Committee
- Focus on priority infrastructure issues affected by climate change
- Create new standards and a sustainable process to support the incorporation and implementation of these new standards
- Build capacity amongst Northern practitioners be involve in the development, and implementation, of standards

Phases of the NISI – Progress to date

Phase 1: Establishing the Foundations

Consultation, information gathering, gaps and needs analysis

Establishing the NAC

RFP for standards development work related to the four priority areas

Over-arching communications approach established

Phase 2: Developing the Standards

Thermosyphons – Completed

Community Drainage – Completed

Permafrost – Completed

Snowloads – Completed

Geotechnical Site Investigation in Permafrost – Initiated April 2015

Phase 3: Building Capacity

Establish relationships to deliver training opportunities

Raising awareness of the value of standards

Facilitating stakeholder buy-in and use of standards

NISI Priority Areas



Thermosyphon
Foundations
for Buildings in
Permafrost
Regions



Changing
Snow Loads in
the North



Moderating the
Effects of
Permafrost
Degradation on
Building
Foundations

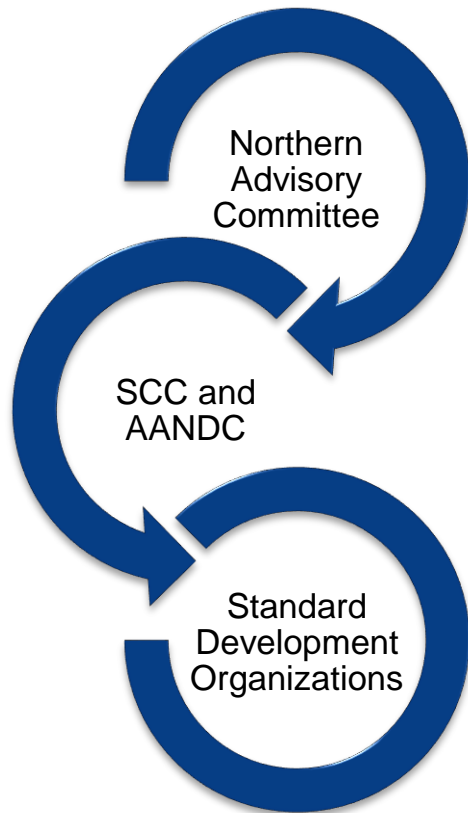


Community
Drainage
System
Planning,
Design &
Maintenance in
Northern
Communities



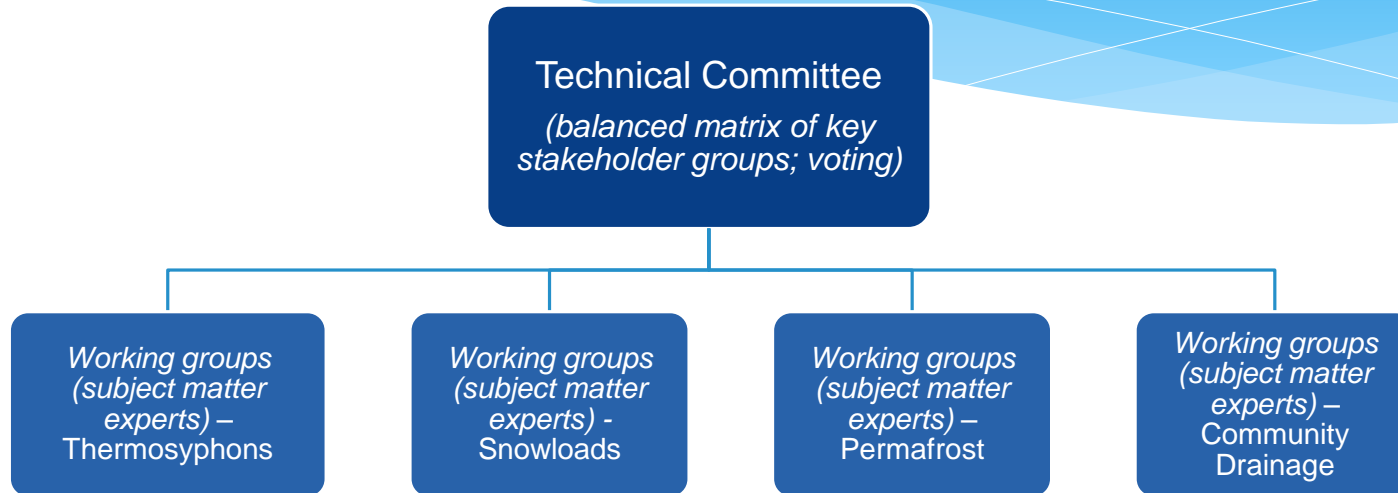
Geotechnical
Site
Investigation
for Building
Foundations in
Permafrost

Northern Advisory Committee



- Comprised of senior management representation from departments with direct responsibility for infrastructure lifecycles:
 - Yukon
 - Northwest Territories
 - Nunavut
 - Nunavik - Kativik Regional Government
- Provides strategic advice and guidance to ensure best results for Northerners

Standards Development Committee Structure



Standards developed “by the North for the North.”

- 48 northerners directly involved in standards development process at working group and technical committee level
 - Engineers, Architects, Building Owners and Maintainers, Regulators, Academics, Subject Matter Experts

Key Participants

NAC Member	Title	Affiliated Organization
Cynthia Tucker	Assistant Deputy Minister, Public Works	YK
Mike Burns	Assistant Deputy Minister, Asset Management Division	NWT
Eleanor Young	Assistant Deputy Minister, Regional Operations	NWT
Frederic Gagne	Director, Public Works	Kativik Regional Gov
Watson Fournier	Director General	Kativik Municipal Housing Bureau
Nelson Pisco	Director, Technical Services Division & Acting ADM	NU
Paul Moore	Assistant Deputy Minister	YK
Darren Flynn	Assistant Deputy Minister, Community Support	NU

Committee Member	Role in NISI	Affiliated Organization
Sara Brown	Co-Chair, Technical Committee	CEO, NWT Association of Communities
John Streicker	Co-Chair, Technical Committee	Councillor, City of Whitehorse
Don Hayley	Working Group Chair, Thermosyphon	Principal Consultant, Hayley Arctic Geoconsulting
Antoni Lewkowicz	Working Group Chair, Permafrost	Dean and Professor, University of Ottawa
Ken Johnson	Working Group Chair, Community Drainage	Associate, Stantec Consulting Ltd.
Heather Auld	Working Group Chair, Snow load	Principal Climate Scientist, RSI Consulting

Thermosyphon Foundations for Buildings in Permafrost Regions

- Requirements for all lifecycle phases of thermosyphon foundations for new buildings in permafrost, including site characterization, design, installation, and commissioning phases as well as for monitoring and maintenance.
- Ensures the long-term performance of thermosyphon-supported foundation systems under changing environmental conditions.
- For use by:
 - designers
 - contractors
 - building owners
 - operators



Managing Changing Snow load Risks for Buildings in Canada's North

- Establish ongoing practices to reduce snow overloading risks over the lifespan of the building including:
 - pre-season roof snow removal planning and building maintenance
 - maintenance procedures
 - monitoring, detection, and assessment methods
 - procedures for snow removal
- For use by:
 - building owners
 - operators / maintainers

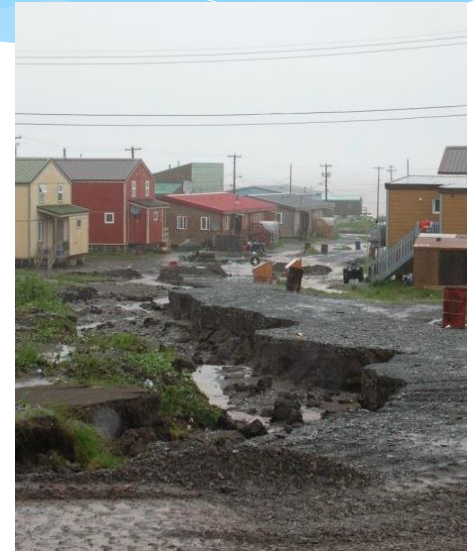


Moderating the Effects of Permafrost Degradation on Existing Building Foundations

- Steps undertaken in order to moderate the effects of permafrost degradation on existing buildings or structures including:
 - Pre-emptive/proactive maintenance; and
 - Long-term maintenance and monitoring.
- For use by:
 - Owners and operators of buildings and other community infrastructure
 - Building contractors
 - Design professionals and reviewers
 - Educators
 - Regulators

Community Drainage System Planning, Design, and Maintenance in Northern Communities

- Minimum planning, design, and maintenance requirements for community drainage systems in northern communities
- Increase the capacity of communities and individuals to prepare and implement effective community drainage plans
- For use by:
 - Community administrators, building and land owners, asset managers, including regulators and inspectors
 - Persons involved in planning, design, construction, operation, and maintenance of surface drainage
 - General public



Geotechnical Site Investigation for Building Foundations in Permafrost

- April 2015 - Initiated
- February 2017 - *Anticipated completion*
- Compliments 4 published standards
- Standardized approach for collecting information and evaluating site conditions by:
 - Addressing procedures, protocols, or methods for:
 - soil, substrate, groundwater conditions and permafrost, ground and air temperature (accounting for seasonal and climatic (future) changes)
 - geo-thermal profile for the site; and
 - test methods, and lab requirements

Unexpected Results

- Sustainability of products:
 - National Standards of Canada are required to be reviewed every five years
- Invaluable to NISI:
 - Direct stakeholder involvement translated into immediate buy-in of standards
 - peer-to-peer working groups
 - NAC

Next Steps

- Continue capacity building activities for NISI Phase 1 standards
 - Training / education
 - Pilot – “train-the-trainer”
- Possible NISI Phase 2:
 - Investigating priority areas
 - validation by NAC

Thank you

For more information or to access a free copy of the published standards,

visit www.scc.ca/en/nisi or
contact Kelly Montgomery
kmontgomery@scc.ca