

THE ENGINEERING PROFESSION'S POSITION

- Critical infrastructure, such as safe drinking water, reliable electricity, wastewater treatment, waste management, information technology, schools, and housing, must be adequately funded, constructed considering changing weather events, and demonstrate resilience in Indigenous reserves and remote Indigenous communities.
- Professional engineers have a vital role to play in supporting Indigenous communities to achieve their desired outcomes for infrastructure planning, design, construction, maintenance, and operation.
- The engineering profession is committed to engaging with Indigenous communities and incorporating their input throughout the project lifecycle respecting and incorporating traditional and cultural practices, and recognizing the value of Indigenous knowledge in the infrastructure life cycle.
- The federal government has a responsibility to ensure that sufficient, predictable, and sustained funding is provided for Indigenous communities to address infrastructure gaps and support capacity building efforts.

The challenge(s)

Public infrastructure is essential for improving the quality of life and economic opportunities in northern, remote, and rural communities across Canada. Unfortunately, a significant portion of the existing infrastructure in these areas is in a state of disrepair, inadequacy, and poor condition¹. This situation disproportionately affects Indigenous communities, exacerbating existing social and economic disparities².

To address these challenges, the federal government is committed to a renewed nation-to-nation relationship with Indigenous peoples based on recognition of rights, respect, truth, co-operation, and partnership, guided by the [Truth and Reconciliation Commission's Calls to Action](#)³. By supporting Indigenous priorities, promoting self-determination, and rectifying inequalities between Indigenous and non-Indigenous populations, the government aims to foster thriving and resilient Indigenous communities. Furthermore,

Indigenous communities, especially those in remote areas, are already experiencing the adverse effects of climate change, such as permafrost melting. The northern regions of Canada are warming at a rate twice as fast as the national average, leading to accelerated environmental challenges like rising sea levels, coastal erosion, and permafrost degradation⁴.

While infrastructure deficits are not exclusive to Indigenous communities, there is a significant disparity in the availability of adequate public infrastructure between northern, remote, and on-reserve communities compared to off-reserve communities and municipalities. The federal government has expressed their commitment to lessening this disparity by addressing the needs of Indigenous communities and rectifying historical inequities⁵. Yet despite substantial investments in public infrastructure, further action is necessary to bridge the gap for equitable access for all.

¹ Statistics Canada. (2022). Housing conditions among First Nations people, Métis and Inuit in Canada from the 2021 Census. <https://www12.statcan.gc.ca/census-recensement/2021/as-sa/98-200-x/2021007/98-200-x2021007-eng.pdf>

² Government of Canada. (2022). Barriers to Economic Development in Indigenous Communities. Report of the Standing Committee on Indigenous and Northern Affairs. <https://www.ourcommons.ca/Content/Committee/441/INAN/Reports/RP11714230/inanrp02/inanrp02-e.pdf>

³ Government of Canada (2022). Budget 2022 A Plan to Grow Our Economy

and Make Life More Affordable. <https://www.budget.canada.ca/2022/report-rapport/chap7-en.html>

⁴ The CBC. (2022). The world's permafrost is rapidly thawing and that's a big climate change problem. <https://www.cbc.ca/news/canada/edmonton/the-world-s-permafrost-is-rapidly-thawing-and-that-s-a-big-climate-change-problem-1.6674976>

⁵ Government of Canada (2022). Federal Budget 2022 – Chapter 7: Moving Forward on Reconciliation. <https://www.budget.canada.ca/2022/report-rapport/chap7-en.html>

To overcome these challenges, a comprehensive and collaborative approach is required, one that actively involves Indigenous communities in the planning, design, and implementation of infrastructure projects. Long-term and sustainable funding commitments from all levels of government are crucial for achieving meaningful improvements. Additionally, tailored solutions that account for the unique circumstances and specific needs of remote communities are necessary, considering their geographical isolation and smaller population size.

The engineering profession is well-positioned to contribute to infrastructure development and maintenance challenges in these communities. Engineers can provide technical expertise, promote safety, sustainability, and resilience in infrastructure projects, and engage with Indigenous communities to understand their perspectives and incorporate their needs. Through collaboration and cooperation, effective and sustainable infrastructure initiatives can be implemented, thereby addressing the distinct challenges faced by northern, remote, and on-reserve communities.

How Engineers Canada has contributed

Engineers Canada and the 12 provincial and territorial engineering regulators are instrumental in improving the safety and resilience of communities across Canada and addressing the effects of climate change on infrastructure. This partnership encompasses a variety of initiatives, such as working with Indigenous communities to evaluate the climate vulnerability of their water and wastewater systems using the [Public Infrastructure Engineering Vulnerability Committee \(PIEVC\) Protocol](#). Engineers Canada has also facilitated assessments of housing, schools, and other infrastructure for the Oneida Nation of the Thames in southern Ontario and has developed an Indigenous toolkit that integrates climate risk assessments into Indigenous community asset management plans. Additionally, Engineers Canada has supported the capacity-building of Indigenous engineers and communities across the country through PIEVC training and risk assessment workshops, while engineering faculties across Canada have collaborated with Indigenous communities to enhance public infrastructure. As of March 2020, the ownership and control of the [PIEVC Program](#) has been

transferred to an alliance consisting of the Institute for Catastrophic Loss Reduction, the Climate Risk Institute, and Deutsche Gesellschaft für Internationale Zusammenarbeit.

In addition, this collaboration also involves:

- Issuing [National Position Statements](#) that highlight timely issues and reflect the engineering profession's stance on critical issues related to public interest including infrastructure, infrastructure on Indigenous reserves and in remote Indigenous communities in Canada, climate change mitigation, and adaptation.
- Supporting [federal initiatives](#) by providing evidence-based recommendations.
- Creating [national guidelines](#) and papers that serve the needs of regulators, engineers, and applicants for licensure regarding the environment, sustainability, and other issues impacting infrastructure in Canada.

Recommendations to the federal government

We commend the Government of Canada for their dedicated efforts in addressing and resolving long-term drinking water advisories in First Nations communities⁶. Through collaboration and investment, progress has been made towards ensuring access to safe and clean drinking water for all. The engineering profession, along with provincial and territorial engineering regulators, plays a crucial role in developing and maintaining infrastructure in Indigenous reserves and remote Indigenous communities in Canada. They ensure that infrastructure projects are tailored to meet the specific needs and challenges of Indigenous communities, such as extreme weather conditions, resource accessibility, and cultural awareness. By engaging directly with Indigenous communities and incorporating their input, engineers help ensure that infrastructure projects are developed in a way that respects and benefits these communities.

Indigenous reserves and remote Indigenous communities often lack infrastructure that is provided to other non-Indigenous communities by municipalities or provinces and territories. The federal

⁶ Government of Canada (2023). Ending long-term drinking water advisories. <https://www.sac-isc.gc.ca/eng/1506514143353/1533317130660>

government is responsible for providing infrastructure on Indigenous reserves. Thus, it has a responsibility to ensure Indigenous communities have access to sufficient, predictable, and sustained funding for the development and maintenance of resilient and sustainable public infrastructure. Collaborating closely with Indigenous communities, the federal government ought to evaluate their infrastructure needs, provide funding for infrastructure projects to address gaps, and offer training in asset management practices to support effective planning and management.

The federal government should also take action to eliminate long-term drinking water advisories on public systems on reserves as soon as possible. It should also support updates to Indigenous infrastructure asset inventories including modernizing data management and support systems and reviewing asset categories and descriptions.

The engineering profession, along with provincial and territorial engineering regulators, will continue to provide recommendations and best practices to the federal government in building and maintaining infrastructure in Indigenous reserves and remote Indigenous communities. To forge a path forward, the federal government should foster collaboration among communities, engineering experts, and provincial and territorial engineering regulators. Through these concerted efforts, secure, dependable, and sustainable infrastructure can be built and sustained in Indigenous reserves and remote Indigenous communities across Canada.

How Engineers Canada will contribute

Engineers Canada is committed to supporting initiatives aimed at boosting the enrollment of Indigenous individuals in post-secondary engineering programs, with the aim of increasing the number of Indigenous engineers.

The engineering profession in Canada is well equipped to offer impartial guidance to the federal government through consultation, evaluation, and partnership. Engineers possess the technical proficiency required to help formulate and execute sustainable and cost-effective plans that establish resilient infrastructure.