

Empathy and engineering

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Cultural collaboration is significant in building thriving communities.



Photo courtesy RJC.

The construction industry in Canada is ever-changing, facing multi-faceted challenges that demand innovative solutions. These challenges are also referred to as “wicked problems.” Wicked problems are a “class of social

system problems which are ill-formulated, where the information is confusing, where there are many clients and decision makers with conflicting values, and where the ramifications in the whole system are thoroughly confusing” (Buchanan, 1992). For instance, Canada’s need for approximately [5.8 million new homes by 2030 to address housing affordability](#) and accommodating immigration targets of [500,000 newcomers in 2025](#) pose a significant and paradoxical challenge. Alongside this, engineers have also been prompted to embrace sustainable practices, due to the pressing issue of climate change and [Canada’s 2050 Net-Zero Emissions goals](#). It is imperative for the industry to re-evaluate its approach to construction, placing greater emphasis on the well-being of communities and residents. The way forward is clear: Engineers must undertake projects with empathy.

Many of the era-defining challenges engineers face today demand an understanding not only of technical competencies, but also of human behaviour, cultural dynamics and situational context—elements frequently overlooked in engineering education and practice. Engineers must possess a profound comprehension of both technical and non-technical factors that will enable them to contextualize solutions within the broader sociocultural context. The absence of this comprehension within complex, interconnected systems can lead to unforeseen negative consequences.

Engineers are problem solvers at heart, relying on their in-depth knowledge of scientific principles to solve complex technical challenges. However, “wicked problems” demand a different approach to produce meaningful solutions. They demand methodologies like [Design-Thinking and Systems-Thinking](#) to navigate complex challenges.

Design-Thinking and Systems-Thinking take on a human element that helps ensure the project aligns with the needs and aspirations of the people it serves. Engineering with empathy, a phrase not commonly heard, is imperative if Canada wants to set itself up for success and to meet its ambitious climate and housing goals.

The role of empathy in engineering

Empathy, in the context of engineering, is the capacity to understand and appreciate the experiences, perspectives and emotions of others, especially those who will live in and use the structures we build.

Empathy **inspires positive change and enables trust among those involved.** This leads to project solutions that are “framed” in the needs of the people they serve, which can also lead to prioritizing sustainable construction, minimizing disruptions and enhancing project outcomes. When engineers apply empathy to their work, a transformation occurs.

For instance, a community restoration and resilience project that **RJC Engineers** is co-leading with the leadership of a First Nation (which has requested to remain anonymous) aims to implement this approach to engineering and design. It has led to an example of successful collaboration, resulting in a culturally relevant and impactful outcome for the community.

During the destructive storms on the west coast of Canada in 2021, an “atmospheric river” caused significant flooding in the community. In partnership with the Nation Leadership, **RJC, Citizen Design Build,** the **IISAAK OLAM Foundation** and the **Roots to Roofs Community Development Society** embarked on a groundbreaking journey of innovation and collaboration.

Departing from the traditional approach of offering standardized house plans, the group recognized the importance of personalized, individual attention. With that in mind, the aim of the project is to ensure each family is actively involved, ensuring their distinct requirements are met while creating homes that work with their culture and lifestyle. The homes’ insulated concrete form (ICF) construction, lifted above the 200-year flood plain, will boast remarkable durability and protection against water damage, ensuring their longevity for generations to come.

The intent of the project is to design not merely a group of buildings, but a Nation-directed approach to housing and resilience that fosters

community engagement and sustainability and supports their vision of a thriving community. Part of the process will be exploring how Indigenous Protected and Conserved Areas (IPCAs) or other holistic approaches can support Nation rebuilding, economic development and environmental stewardship, with healthy housing at its core.

The value of thriving communities

Sustainable buildings are not just about the environment; they play a pivotal role in fostering thriving communities. When sustainable design is coupled with empathy and cultural collaboration, it positively impacts the well-being of an entire community. Not only does it foster a socially inclusive environment, but it also builds resilient, future-proofed neighbourhoods.

Our methodology in supporting the Nation in recovery from the flooding event prioritizes empathy, actively listening and collaborating to meet the requirements of Nation members and Leadership rather than imposing a preconceived plan.

This project presents an opportunity to embed capacity at the Nation level and produce sustainable livelihoods for Nation members. One of the ways this will be accomplished is through apprenticeship programs in a variety of trade areas for interested community members. This opportunity will also be open to other First Nations in the area, supporting Nation-to-Nation collaboration. In addition, we will look at supporting the development of small-to-medium-sized enterprises (SMEs) that can support the project over its five-year duration, creating additional economic opportunities within the community.

Through our [Building Condition Assessments](#), the team at RJC gained valuable insights into factors contributing to the area's flooding and explored ways to improve these conditions. By combining traditional knowledge from Nation leadership and members with engineering expertise, we have developed a strong relationship, which will result in a holistic and culturally sensitive approach to the community's design. This

approach demonstrated a deep commitment to cultural sensitivity, respect for the Nation's self-determination and genuine desire to collaborate closely and develop meaningful relationships.

Conclusion

To address our current challenges, we must foster a culture of empathy within the engineering industry that can extend to all construction and development sectors. Thought leaders are pivotal in driving this positive change, encouraging stakeholders to embrace empathy as an integral part of community engagement.

But where do we start? The [RJC Truth & Reconciliation Webinar](#) is a great stepping stone. It offers a platform for engineers and spokespeople within Indigenous communities to come together virtually, share experiences and learn from one another. The topics discussed in this webinar will help to illuminate a path towards upholding the industry-specific calls (Call to action 92) in the Truth and Reconciliation Commission's 94 Calls to Action and provide an example of how the industry can support the United Nations (UN) Declaration on the Rights of Indigenous Peoples (UNDRIP). It is a chance to infuse empathy into the essence of our industry, making sure each project is not just a structure, but a testament to our commitment to the well-being of the communities we live in.

Empathy in engineering isn't just a concept, it is a path towards sustainable buildings and thriving communities. It's time to embrace empathy as the heart and soul of our profession, redefining how we engineer and solve problems for a brighter, more compassionate future in Canada and beyond.

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