

LUNCH KEYNOTE

Road to Manitoba's North: Overcoming Engineering Challenges

The northern Manitoba town of Churchill is now without rail service after the railway was shut due to flood damage. The town currently relies on rail to transport goods and services, so the closed rail line has stimulated calls for building a road to Churchill.

Building a road to Churchill poses a host of complex engineering challenges. The road has to cross regions of continuous permafrost in the northern stretch and sporadic permafrost in the south, and climate change is expected to result in warming, and therefore thawing, of the permafrost. Another challenge is building a road on peat bogs. If not frozen, peat is a highly compressible material with very low shear strength. It also decomposes over time, reducing its capacity to carry loads. The extreme compressibility and low shear strength of peat causes stability problems or excessive deformations. Flooding is also a challenge. It can wash out road embankments, bridge crossings, and drainage culverts in the same way it did the existing rail line.

This presentation discusses Dr. Alfaro's research findings from instrumented sites along two northern Manitoba roads and an Arctic road in the NWT. Lessons learned from the performance of those roads can be applied to building a road to Churchill.



Keynote Speaker: Dr. Marolo Alfaro, P.Eng.

Marolo Alfaro is a professor in the Department of Civil Engineering at the University of Manitoba. He obtained his Ph.D. from Saga University, Japan, and received postdoctoral fellowships from the Royal Military College of Canada and the University of Calgary.

Dr. Alfaro's research interests include geosynthetics for civil engineering applications, ground improvement techniques, hydroelectric earth dams, road embankments on soft foundations, stabilization of natural and engineered slopes, northern infrastructure impacted by climate change, and cold regions engineering. He has published widely in technical journals and in conference proceedings, and has co-authored a book and two book chapters.

Dr. Alfaro has served as Vice-President for Canada of the North American Geosynthetics Society, Executive Board Member of the Canadian Geotechnical Society, Canadian representative to the Committee on Ground Improvement of the International Society of Soil Mechanics and Geotechnical Engineering, and Associate Head of the Department of Civil Engineering. He also helped establish the Filipino Members Chapter of Engineers Geoscientists Manitoba.