CALL FOR POSTDOCTORAL RESEARCHER IN STRUCTURAL ENGINEERING:

3D-PRINTED CONCRETE HOUSING FOR REMOTE MINING COMMUNITIES

Position Title: Postdoctoral Researcher in Structural Engineering

Category: Postdoctoral Visitor (PDV)

Supervisors: Prof. Liam Butler, Prof. Magdalena Krol and Prof. Matthew Perras

Unit: Civil Engineering, Lassonde School of Engineering

Location: York University, Keele Campus, Toronto, Canada

Salary: $60,000 per year (plus benefits)

Preferred start date for May 2026 but a Fall 2026 start date will also be considered

Review of applications begins on March 2nd, 2026 (position will be open until filled)

Background

The remote communities in which many mines operate are important stakeholders in their sustainability. As a by-product of mining, significant amounts of waste rock are produced and utilizing this material as a replacement for natural aggregate in concrete is a promising sustainable solution. In addition, emergent technologies in additively manufactured concrete structures are quickly gaining momentum throughout global construction sectors. In Canada, we have the opportunity to make significant gains towards addressing the labour shortage in construction in remote communities, reducing the time it takes to build housing, improving construction safety and lowering the overall carbon footprint of our built infrastructure. This project aims to develop new 3D-printed concrete (3DPC) mixtures which incorporate mine waste rock and provide much-needed data on their environmental and structural performance under realistic climatic conditions. The objectives are to, 1) investigate methods for processing and charactering waste mining rock for use in 3DPC, 2) develop viable 3DPC mixture proportions incorporating the waste mining rock and other secondary materials, 3) evaluate the performance of small-scale 3DPC elements, and 4) quantify any environmental impacts of the 3DPC structures and undertake a lifecycle assessment.

Our industry partners, Printerra Inc. and Orla Mining, have clearly expressed a critical need for this research to allow them to support and increase the market for 3DPC structures and the utilization of waste rock in the construction of new buildings in remote communities in Ontario and Canada.

Role of the Postdoctoral Researcher

As a researcher affiliated with the Department of Civil Engineering, with the guidance of Profs. Butler, Krol, and Perras, and with close collaboration with industry partners, the Postdoctoral Researcher will help lead cutting-edge research into 3D-printed concrete housing, utilizing mining waste in remote communities. More specifically, the Postdoctoral Researcher will be responsible for the following tasks and activities: undertaking 3D-printed concrete mixture design development, material characterization and testing, data analysis and modelling, publication writing, presenting to industry partners and other stakeholders, and supervision and mentoring of undergraduate and graduate students. The successful candidate will become part of a larger research group consisting of post-doctoral, PhD, MASc and undergraduate researchers engaged across structural, geotechnical and environmental engineering disciplines.

Education and Qualifications

CALL FOR POSTDOCTORAL RESEARCHER IN STRUCTURAL ENGINEERING:

3D-PRINTED CONCRETE HOUSING FOR REMOTE MINING COMMUNITIES

Applicants must have completed all requirements for a PhD in Civil/Structural Engineering (or closely related field) prior to undertaking this position. Applicants should have extensive experience in concrete materials development, laboratory testing, and concrete structures and are expected to have a significant publication record within relevant high-quality peer reviewed journals. Candidates with demonstrated experience and a publication record in additive construction and/or 3D-printed concrete materials would be particularly desirable. As this project is highly interdisciplinary and involves working with a diverse team of academic and industry partners, candidates should possess excellent communication and writing skills, including the ability to communicate complex technical knowledge effectively with a wide range of stakeholders.

We seek qualified candidates who share our commitment to equity and inclusion, who will contribute to the diversification of ideas and perspectives. We especially welcome applications from Indigenous (Aboriginal) peoples, women, members of racialized communities (visible minorities), persons with disabilities, and persons who identify as 2SLGBTQ+.

Terms and Conditions

This postdoctoral position is based in the Department of Civil Engineering at York University and will be 24 months in length. Possibility of an extension will be contingent on project funding but will not normally be longer than one year. The salary for this position will be $60,000 per year (+ benefits).

How to Apply

To apply for this position, please submit the following documents:

- A cover letter
- A detailed curriculum vitae
- Three-page statement of research interests, including past research and future research directions.
- List of references (letters of reference are not required at the time of application)

Please submit all documents by email to Prof. Liam Butler (Liam.Butler@Lassonde.yorku.ca) by March 2nd, 2026, to receive full consideration.

Qualified applicants will be invited for an interview to be conducted in person and/or remotely. Only those applicants selected for consideration will be contacted.

Research in the Department of Civil Engineering

Three main research themes distinguish the program: infrastructure, resilience, and sustainability through the established sub-disciplines of Environmental and Geo-Environmental, Geotechnical, Structural, Transportation, and Water Resources Engineering.

Cutting-edge research is being carried out in our state-of-the-art facilities, which are located in the Bergeron Centre for Engineering Excellence and across the Keele Campus. The facilities include 750m^2 of dedicated laboratory space, including the Structures High-Bay Laboratory, the newly established Climate-Data-Driven Design (CD3) Facility for Built Infrastructure, and additional research laboratories and computational facilities for Geo-Environmental, Geotechnical, Construction Materials, Transportation and Water Resources sub-disciplines.

3D-PRINTED CONCRETE HOUSING FOR REMOTE MINING COMMUNITIES

Our state-of the-art facilities allow graduate students and postdoctoral researchers to conduct research on above-ground and buried infrastructure; on the performance of civil infrastructure during extreme loading events, including the influence of climate change; on the development of novel materials and construction technologies that improve the resilience of civil infrastructure; on innovative site remediation technologies; on development of technologies for construction using recycled and renewable materials; on construction over marginal-quality land and degrading permafrost; on smart wastewater and material recovery technologies; and on advanced transportation research including transportation safety, security, and intelligent transportation systems. Additional information about the Department of Civil Engineering is available here: https://lassonde.yorku.ca/civil/.

About York University and Toronto

York University was founded in 1959 and has now planted its flag at three central campuses: Glendon, Keele and Markham Centre. York also has two locations in downtown Toronto: The Miles S. Nadal Centre and the Osgoode Professional Development Centre, as well as international locations in India and Costa Rica. The third largest university in Canada, York is a positive force for change as a leading teaching and research university. The student body is both large and diverse with over 53,000 students from 178 countries walking through its halls with over 1,400 full-time faculty members and librarians.

Research at York is strongly engaged internationally and has significant global impact. Indeed, over the past five years, 55% of York publications resulting from the collaboration of two or more authors have at least one author from outside of Canada. This leads all Ontario universities. York is currently ranked 35th globally in the Times Higher Education Impact Rankings. Through the YSpace Network and the Bergeron Entrepreneurs in Science and Technology (BEST) program, York's growing momentum as an entrepreneurship and innovation launch pad has helped to support over 2100 start-ups.

York scholars have achieved the highest recognition in their fields. They include over eighty Royal Society Fellows and twenty-five Distinguished Research Professors. They have been inducted as members of the College of New Scholars, Artists and Scientists and named Killam Professors, Humboldt Fellows, Fulbright Scholars, and Trudeau Foundation Fellows. They have been recognized as Steacie Medalists and Governor General's Award winners and receive a range of disciplinary honorifics and prizes for their books, lectures, and other scholarly achievements. York's allocation of thirty-five Canada Research Chairs is complemented by over thirty York Research Chairs and over thirty-five named Chairs and Professorships.

York University's Keele Campus is located in Toronto, Canada. Toronto is Canada's largest city and the capital of the Province of Ontario. While the city, which is on the north shore of Lake Ontario, has a population of approximately 2.9 million, the surrounding metropolitan area, the Greater Toronto Area (GTA), reaches upwards of 6 million. Toronto is distinctly multicultural, with an estimated 50% of the population being born outside of Canada. This has in turn made the city 'a city of neighbourhoods because it is composed of many distinct, smaller areas with unique cultures.