

The Canadian
Geotechnical Society



La Société Canadienne
de Géotechnique

CGS Luncheon Presentation

Energy Efficiency of Below-Grade Envelope of the Stanley-Pauley Engineering Building in Winnipeg

Presented by:
Kirill Bobko

M.Sc. Student, Geotechnical Engineering – University of Manitoba

Presentation Abstract:

Stanley Pauley Engineering Building, located at the Fort-Garry campus at the University of Manitoba, became an object of study in terms of energy performance of its basement structure. Particularly, the effect of seasonal freezing and variation of soil thermal properties is assessed to predict heat loss of basement structures. For this purpose, two approaches have been considered. The first approach treats soil as a solid material with constant thermal properties in an unfrozen state, while the second approach takes into account the effects of redistribution of partially unfrozen water and ice content during freezing and thawing cycles in the soil by considering the phase-change mechanism. Thermal and physical properties of soil samples collected from the construction site were measured in the lab and used in numerical simulations. It was concluded that the phase change of pore-water significantly affects the heat loss through the basement enclosure, compared to the model with constant soil properties. Additionally, several alternatives suggested to reduce heat dissipation and increase energy savings are discussed.

About the Presenter:

Kirill Bobko received his master's degree in Civil Engineering (Geotechnical Design) in 2013 at State University of Architecture and Civil Engineering in his hometown Nizhny Novgorod, Russia. After graduation he went to work for ThyssenKrupp Industrial Solutions (RUS) for almost three years, where he obtained his first geotechnical experience. During that time, he practiced designing different types of foundations for chemical industry projects. Kirill was responsible for numerical modelling and design of foundations including detailed drawings. While working in ThyssenKrupp, he was assigned to work in ZapSib-2 Task Force at branch office in Germany for 6 months, mainly developing project specifications and test pile program.

In 2016 he entered M.Eng. Program (Geotechnical Design) at University of Manitoba with an International Graduate Entrance Scholarship (IGES). After a period of time he was transferred into M.Sc. stream and completed his degree in 2018. Kirill's research interest was mainly focused on numerical modelling of heat transfer problems in the soil, field and laboratory work. During school time at the University of Manitoba, he was able to publish two conference papers as author and co-author. Kirill is a student member of CGS since 2016.

Date: Thursday, September 6, 2018

Time: Lunch at 12:00 PM, Presentation at 12:20 PM

Location: Holiday Inn South, 1330 Pembina Highway

RSVP: 12:00 PM, Thursday, April 19, 2018

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