

The Canadian
Geotechnical Society



La Société Canadienne
de Géotechnique

CGS Luncheon Presentation

1. Preliminary Results from Field Monitoring of Frost Heave Effects on Steel H-piles

Presented by:

Joash Adajar, Ph.D. Candidate

University of Manitoba

2. Instrumentation and Associated Monitoring Program to Measure Drag Force on Driven H-Piles Subjected to Negative Skin Friction

Presented by:

Sepehr Chalajour, Ph.D. Candidate

University of Manitoba

Presentation Abstract 1:

Frost heave in soils during winter can significantly affect pile foundations. Piles are prone to experience significant upward displacement due to frost heave forces. A part of these frost heave forces, acting on pile foundations in response to the freezing of the surrounding soil, are contributed by adfreeze stresses along the pile shaft. Research is ongoing to improve the understanding of adfreeze stresses on piles. This paper discusses a unique field instrumentation program designed to quantify adfreeze stresses and to better understand the mechanisms involved with their development on piles due to frost heave. Strain gauges were installed on the pile shaft to measure adfreeze stresses. Piezometers, thermistor strings, magnetic sensors, Shape Accel Arrays, and heaving pins/plates were installed in the vicinity of the pile to monitor parameters that can be beneficial in characterizing the mobilization of adfreeze stresses on piles. Preliminary data collected from the first monitored winter period are also presented in this paper.

Bio for Presenter 1:



Joash is a Ph.D. Student in the University of Manitoba under the supervision of Dr. Marolo Alfaro. He completed his B.Sc. in Civil Engineering at the University of Philippines, and his M.Sc. in Geotechnical Engineering at University of Manitoba. His Master's thesis focused on utilizing Discrete Element Method in assessing landslides. He is currently working on the impact of frost heave forces on pile foundations for his Ph.D. research study. Joash was previously part of the executive committee of the Manitoba Section CGS Student Chapter. His interests outside of academia include playing basketball and video games.

Presentation Abstract 2:

The need for infrastructure has increased due to population growth to facilitate economic activities. Piles transfer infrastructure loads to competent ground layers, especially where the surface soil lacks adequate bearing capacity. One of the challenges that may arise in cohesive soils is negative skin friction (NSF), occurring due to the settlement of the surrounding soil relative to the piles. NSF results in an additional axial force on the pile, referred to as drag force which has caused several failure cases in pile-supported structures. This study discusses an instrumentation program, data monitoring and analysis on a 36-meter driven H-Pile located at the edge of the bridge abutment's foundation on an active project to arrange a measurement approach to better understand the load transfer mechanism along the pile. Associated interpretation, data corrections, and lessons learned are discussed to provide an approach to calculate the axial force distribution.

Date: Friday, November 3, 2023

Time: Presentation at 12:00 PM

Location: Holiday Inn South, 1330 Pembina Highway

RSVP: 12:00 PM, Wednesday, November 1, 2023

Registration Fee (debit, credit, PayPal):

Membership	Price (\$)	Registration and Payment Link ^{1,2}
CGS Member	30	Buy Now
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Bio for Presenter 2:



Sepehr is a Ph.D. candidate in geotechnical engineering at the Civil Engineering Department of the University of Manitoba. He completed his B.Sc. and M.Sc. in Civil Engineering and Geotechnical Engineering, respectively. Sepehr works on the piling program, instrumentation, advanced lab tests and numerical simulations, with a focus on monitoring the drag force and downdrag development on piled foundations. Furthermore, he has gained experience in designing various types of flexible and rigid walls, embankment construction and stabilization, tunneling, slope, and excavation stabilization techniques, as well as soil improvement methods during more than 13 years in academia and practice. Sepehr has also been involved in academia as a teaching assistant for a variety of civil and geotechnical courses since the beginning of his academic studies, in addition to his involvement in various civil and geotechnical associations.

For event information, please visit:

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- This event qualifies for 1 Professional Development Hour. The event is classified as 'Informal Activity' under EGM's CPD Program.
- Please note that if you are unable to attend, someone else can be sent in your place. We are accepting walk-ins depending on seating availability.
- If you wish to be added to the mailing list, please send an email to cgs.manitoba@gmail.com