

# Alireza Afkhami, M.A.Sc., M.C.P., P.Eng.

## Senior Geotechnical Engineer (Vancouver, BC)

### EXPERIENCE SUMMARY

Alireza is a Senior Geotechnical Engineer based in Vancouver, BC. He has more than 22 years of consulting experience in seismic assessment and geotechnical design, with a specialized focus in engineering analysis. Sectors of extensive geotechnical practice include site characterization and seismic design including soil liquefaction analysis, site-specific response spectra analysis, pile design, slope stability and design of segmental and MSE walls, excavation and shoring design, and project management spanned over 1000+ projects. He has provided geotechnical engineering services for a variety of market sectors including institutional, commercial, transportation, and residential, spanning a wide range of small to large scale projects.

In 2008, Alireza co-founded [Novo Tech Software Ltd.](#), and developed several computer programs (both desktop and cloud-based) for geotechnical engineering. Currently, over 1000 consulting engineering companies and universities across the world use Novo Tech tools in their project. In 2021, Novo Tech Software was acquired by Rocscience Inc, a leading geotechnical software company based in Toronto, Canada. Alireza is currently Senior Manager – Web Applications at Rocscience Inc.

### WORK EXPERIENCE

Projects that highlight Alireza's experience include:

#### North Surrey Sports & Ice Complex (Surrey, BC) 2016 / 2019:

Completed in 2019, this 134,000 ft<sup>2</sup> facility features three ice rinks, community meeting spaces, food services, and outdoor activity areas, with a fitness centre, yoga studio, and indoor cycling. The subsurface soil conditions at this site included up to 4 metres of fill material underlain by very soft silt and peat, and liquefiable loose sand to a depth of 30 to 40 metres, with a shallow groundwater level. The geotechnical design of any structure on this type of soil stratigraphy is always very challenging, both in static loading condition (bearing capacity / settlement) as well as following a design earthquake and impact of soil liquefaction on the foundations. Alireza was the project manager and lead engineer for this project and was responsible for the design of steel and concrete piles (static and seismic loading conditions) as well as supervision of the field engineers during pile installations and site preparation.

#### BC Ministry of Transportation - Evergreen Line Rapid Transit, (Burnaby and Coquitlam, BC) 2012 / 2014:

Segment lead designer (including Lougheed Town Centre Station, Lougheed Special Structure, North Rd Elevated Guideway (2 Km, Burquitlam Station). Main responsibilities:

- Planning for site characterization, field test processing (CPT, SPT, BPT and PMT),
- Engineering analyses and report preparation including shallow footings, large diameter drilled shafts, soil liquefaction assessment, site-specific dynamic response spectra analyses, slope stability analysis, and pile lateral response analyses.
- Attending weekly meetings and collaboration with other disciplines (e.g. architects, mechanical engineers, structural engineers) SNC-Lavalin and client's technical team.
- Construction support: attending kick-off meetings, field inspections, providing support to site engineers, reviewing daily construction reports, preparation of technical memos, reviewing IFC drawings.
- Responding to the 'Owner's Engineer' comments and updating geotechnical design reports.

### EDUCATION

**M.A.Sc., Geotechnical Engineering**  
Tehran Polytechnic University, Tehran, Iran

**B.Sc., Civil/Structural Engineering**  
Sharif University of Technology Tehran, Iran

Design of Piled Foundation (short course), Dr. Bengt Fellenius, Vancouver, BC

Soil Liquefaction (short course), Dr. Idriss & Dr. Boulanger, Vancouver, BC

Microsoft Certified Professional (MCP) in Computer Programming

International Computer Driving License (ICDL)

### AREA OF EXPERTISE

Geotechnical design experience, from field investigations to design and construction inspection with specialization in pile design, slope stability analysis, segmental retaining wall design, shoring design, seismic analysis

### REGISTRATIONS/ AFFILIATIONS

Association of Professional Engineers and Geoscientists of British Columbia (EGBC)

Vancouver Geotechnical Society (VGS)

Canadian Dam Association (CDA)

International Society for Soil Mechanics and Geotechnical Engineering (ISSGE)

Tehran Construction Engineering Organization (TCEO)

Iranian Geotechnical Society (IGS)

### AWARDS

2014 Tetra Tech EBA Innovation Award for retrofit of a MSE wall

### CONTACT

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- Special features: Fifty, 2.4 to 2.7 m diameter drilled shafts with slurry and/or casing, 0.6 to 1.2 m driven piles, limit states design, interpretation of CSL and PDA test results and HP release, WEAP analysis, stone columns, soil mixing (> 1000 columns), tunnel box jacking (Loco Station at Barnet Hwy).

### **BC Ministry of Transportation Public Works – Alaska Highway Repair 2013 / 2014:**

Repair of Alaska Highway alignment at three areas; included providing several design options. The selected design consisted of Sierra Scape retaining wall. The main challenge was uncertainties regarding the subsurface condition and presence of crib walls and gabions on which the proposed wall will be supported.

### **BC Ministry of Transportation - Westside Road Interchange (Kelowna, BC) 2012 / 2013:**

Remedial design to stabilize a failing MSE wall using a combination of tie-back soil anchors and reinforced concrete wall supported on Helical piles; this included close cooperation with structural engineers, client and the contractor. Responsibilities during construction included reviewing the field inspection reports and addressing construction issues. Alireza co-authored a paper that will be presented in 2014 CGS conference in Regina, Canada. He also received the corporate wide innovation award for his design.

### **AB Ministry of Transportation - Northeast Anthony Henday Drive (Edmonton (AB) 2012 / 2013:**

Slope stability, bearing capacity and settlement analyses for Mechanically Stabilized Earth (MSE) walls and bridge abutments; reviewing pile design soil parameters.

**BC Hydro - Interior to Lower Mainland Transmission Line (Merritt to Coquitlam, BC) 2012:** Pile design including static and seismic bearing, soil liquefaction and lateral spreading analyses, site-specific dynamic response spectra analysis, Cone Penetration Test interpretation and analysis; reviewing IFC drawings.

**Roberts Bank Rail Corridor (Surrey, BC) 2012:** Pile design including static bearing and lateral deformation under seismic loads, abutment design using lightweight material (EPS), site-specific response spectra analysis (Seismic), Cone Penetration Test interpretation and analysis.

**Douglas Channel LNG Plant (Kitimat, BC) 2012:** Site characterization, pile design for LNG tanks, settlement analysis, bearing capacity of rock sockets for dolphin structure, slope stability analysis and estimation of post-earthquake slope movements and induced loads on piles, seismic analysis based on ASCE, NFPA, CSA-Z276-11 codes. Preparation of geotechnical and seismic report.

**Slope Remediation (West Vancouver, BC) 2008:** Several slope stability analyses for a pile supported residential building situated on steep sloped terrain, including design of a 65 ft high Mechanically Stabilized Earth (MSE) wall using Lock Blocks, field reviews during construction.

Design of various pile supported structures in peat area of Vancouver and Queensborough. Use of lightweight aggregates in very soft ground conditions. Projects spanned from residential buildings to parks, waterfront structures and BMX tracks.

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