1. PERSONAL INFORMATION

Position	Associate Professor
Address	2035 Minto Centre , Dept. of Civil & Environmental Engineering, Carleton University
Contact	Tel: (613) 520 2600 X 8890 Email: Mohammad.Rayhani@carleton.ca
Registration	Professional Engineers of Ontario (PEO), Canada (since 2008)

2. EDUCATION

PDF	Queen's University, Kingston, Canada Dept. of Civil Engineering Project: Hydraulic performance of GCLs in landfill applications.	2007-2009
Ph.D.	University of Western Ontario, London, Canada Dept. of Civil & Environmental Engineering Thesis: Centrifuge Modeling of Seismic Site Response and Soil-Structure Interaction.	2004-2007
M.Sc.	Kharazmi University, Tehran, Iran Thesis: Evaluation of Mechanical Behavior of Rock-fill Materials using Large Scale Triaxial and Direct Shear Tests.	1998-2001
B.Sc.	University of Tabriz, Tabriz, Iran	1993-1997

3. HONORS AND AWRADS

- Best Paper Award, Canadian Geotechnical Society, GeoVancouver Conference, Vancouver 2016
- Faculty of Engineering and Design Supplement Award, Carleton University, 2013
- NSERC Postdoctoral Visiting Fellowship at Canadian Government Labs (declined), 2008
- Graduate Teaching Assistant Award, University of Western Ontario, 2007
- Graduate Research Thesis Award: University of Western Ontario, Canada, 2007
- Novak's Prestigious Award for research achievements in soil-structure interaction, UWO, 2007
- SOGS 125th Anniversary Award, University of Western Ontario, 2006
- Western Graduate Research Award: University of Western Ontario, Canada, 2005
- Graduate Student Scholarship: Ministry of Science, Research & Technology, Iran, 2004
- Engineering Prize for Achievement in Research, Ministry of Housing & Urban Development, 2003

4. ACADEMIC AND EMPLOYMENT RECORD

4.1 Academic Employment

2014-present	**Associate Professor** Dept. of Civil & Environmental Engineering, Carleton University
2009-2014	**Assistant Professor** Dept. of Civil & Environmental Engineering, Carleton University
2007-2009	**Postdoctoral Fellow and Sectional Lecturer** Dept. of Civil Engineering., Queen's University
2004-2007	**Research Assistant** Dept. of Civil & Environmental Engineering, University of Western Ontario
2000-2004	**Research Engineer** Dept. of Geotechnical Eng., Building and Housing Research Center, Tehran

4.2 Industry Experience

Experience highlights (1996-2004)

- Over 8 years of professional geotechnical engineering experience in analysis and design of foundations, underground excavations, embankments and slopes

Senior Geotechnical Engineer, Building & Housing Research Center, 01/1999 to 09/2004

- Preparation of Qanat collapse hazard zonation map in greater Tehran area (geo-hazard)
- Machine foundation design for Paksan factory in Tehran (foundations)
- Pile foundation design – Damghan Microwave Station, Iran (foundations)
- Stabilization of Neka Landslide (geo-hazard).

Geotechnical Engineer, Ashenab Consulting Engineers, 06/1996 to 01/1999

- Sabalan rockfill dam – Stage IV *(Dam/Tunnels) - Northwest Iran*.
- Sagezchi earth dam – Stage II *(Dam/Construction) - Northwest Iran*.

5. Professional Training

Year	Course	Location	Organization
2018	Design and Construction of Earthworks	Calgary	Educational Program Innovations Center
2018	Foundation Design	Edmonton	Educational Program Innovations Center
2017	Sanitary Landfill Design	Toronto	Educational Program Innovations Center
2017	Slope Stability Analysis and Design	Toronto	Educational Program Innovations Center
2016	Design and Construction of Earthworks	Calgary	Educational Program Innovations Center
2016	Geotechnical Eng.: Fundamentals & Applications	Ottawa	International Asset
2015	Geotechnical Implications of Pavement Design	Toronto	Educational Program Innovations Center
2015	Advanced Foundation Design	Ottawa	Carleton University
2014	Geotechnical Eng.: Fundamentals & Applications	Regina	Educational Program Innovations Center
2014	Modern Landfill Design	Ottawa	Carleton University
2013	Geotechnical Eng.: Fundamentals & Applications	Vancouver	Educational Program Innovations Center
2013	Advanced Foundation Engineering	Ottawa	Carleton University
2012	Geotechnical Eng.: Fundamentals & Applications	Ottawa	Educational Program Innovations Center
2012	Landfill Design for Municipal Solid Wastes	Ottawa	Carleton University
2009	Applied Geophysics	Kingston	Queen's University

6. Publications

Note: Students supervised at Carleton are in bold. *Undergraduate research students.

Book Chapters

A1 **Aldaeef, A.,** and Rayhani, M.T., (2017). Adfreeze strength and creep behavior of pile foundations in warming permafrost. *Advances in Analysis and Design of Deep Foundations, Editor:* H.F. Shehata, Springer, DOI 978-3-319-61642-1-20.

A2 Rayhani, M.T., and **Aldaeef, A.**, (2014). Recent advances in hydraulic performance of clay liners. *Clays and Clay Minerals: Geological Origin, Mechanical Properties and Industrial Applications.* Editor: Liam R. Wesley, Nova Science Publishers, ISBN**:** 978-1-63117-779-8.

A3 Rayhani M.T., (2004). Geotechnical hazards. Chapter 3 in "Lessons learned from the 2003 Bam Earthquake", Building & Housing Research Center, ISBN: 964740473-5.

Refereed Journal Papers

B1 **Aldaeef, A.,** and Rayhani, M.T., (2018). Load transfer of pile foundations in frozen and unfrozen soft clay*, Cold Regions Science and Technology,* Submitted in May 2018.

B2 **Afriyie, G.,** Braimah, A., and Rayhani, M.T. (2018). Effect of explosive cratering on embankment dams. *Int. Journal of Geotechnical Engineering,* **12** (2): 200-208.

B3 **Torabi, H.,** and Rayhani, M.T., (2017). Equivalent-linear pile head impedance functions using a hybrid method. *Soil Dynamics & Earthquake Engineering,* **101**:137-152.

B4 **Hosseini, A.,** and Rayhani, M.T., (2017). Evolution of pile shaft capacity over time in marine soils. Int. Journal of Geo-e*ngineering,* Springer, **8** (1): 12.

B5 **Safari, E., Al-Suwaidi, G.**, and Rayhani, M.T. (2017). Performance of biocover in mitigating methane emission from municipal solid waste landfills. *ASCE J. of Environmental Eng.,* **143** (5): 06011003.

B6 **Giraldo, J.,** and Rayhani, M.T. (2017). Axial and lateral load transfer of fiber-reinforced polymer (FRP) piles in clay soil. *Int. J. of Geotechnical Engineering,* **11** (2): 149-155.

B7 **Torabi, H.,** and Rayhani, M.T., (2016). Comprehensive nonlinear seismic response of Leda clay in Ottawa Valley. *Bulletin of Earthquake Engineering,* **15** (1): 123-147.

B8 **Aldaeef, A.,** and Rayhani, M.T., (2015). Hydraulic performance of compacted clay liners under simulated daily thermal cycles. *Journal of Environmental Management,* **162**:171-178.

B9 **Afshin, A.,** and Rayhani, M.T., (2015). Evolution of bearing capacity with time for small scale piles driven into Leda clay. *Int. Journal of Geotechnical Engineering*, **9** (3): 307-315.

B10 **Aldaeef, A.,** and Rayhani, M.T., (2014) Hydraulic performance of compacted clay liners under simulated field conditions. *Journal of Waste Management*. **34** (12): 2548-2560.

B11 **Torabi, H.,** and Rayhani, M.T., (2014). Three dimensional finite element modeling of seismic soil-foundation-structure interaction in soft clay. *Journal of Computers in Geotechnics,* **60**:9-19.

B12 **Giraldo, J.,** and Rayhani, M.T., (2014). Load transfer of hollow fiber-reinforced polymer (FRP) piles in soft clay. *Transportation Geotechnics,* **1**: 63-73.

B13 **Sarabadani**, **H.,** and Rayhani, M.T., (2013). GCL shrinkage under simulated daily thermal cycles. *Journal of Waste Management and Research*, DOI: 10.1177/0734242X14529179.

B14 **Giraldo, J.,** and Rayhani, M.T., (2013). Influence of FRP on pile-soil interface strength in soft clays. *ASTM Journal of Advanced in Civil Eng. Materials*, **2** (1): 1-18.

B15 Rowe R.K, Rayhani M.T., Take A., Siemens G., and Brachman R., (2013). Physical modelling of NW-NW GCL shrinkage under simulated field conditions.*Geotextiles & Geomembranes,* **40**: 12-19.

B16 **Sarabadani**, **H.,** and Rayhani, M.T., (2013). Impact of confining pressure on GCL hydration from subsoil. *Journal of Solid Waste Technology and Management,* **40** (1): 292-303.

B17 **Barclay, A***, and Rayhani, M.T., (2013). Effect of temperature on hydration of geosynthetic clay liners in landfills. *Journal of Waste Management and Research,* **31** (3): 265-272.

B18 **Sarabian, T***, and Rayhani, M.T., (2013). Rate of hydration of geosynthetic clay liners from clay subsoil. *Journal of Waste Management*, **33**: 67-73.

B19 **Anderson, R***, Rayhani, M.T., and Rowe, K., (2011). Laboratory investigation of GCL hydration from clayey sand*, Journal of Geotextiles and Geomembranes,* **31**: 31-38

B20 Rayhani, M.T. and El Naggar, M.H., (2011). Physical & numerical modelling of seismic soil-structure interaction in layered soils. *J. of Geotechnical & Geological Engineering*, **30**: 331-342.

B21 Rayhani M.T., Rowe R.K, Brachman R.W.I., Siemens G., and Take A., (2011). Factors affecting GCL

hydration under isothermal conditions. *Geotextiles & Geomembranes,* **29**: 525-533.

B22 Rowe R.K, Rayhani M.T., Take A., Siemens G., & Brachman R., (2011). GCL hydration under simulated daily thermal cycles. *Journal of Geosynthetics International,* **18** (4): 196-205.

B23 Soroush, A., **Aghaei, A.**, and Rayhani, M.T., (2010). Large-scale Triaxial testing and numerical modeling of rounded and angular rockfill materials. *International Journal of Science and Technology,* **17** (3): 169-183.

B24 Rayhani, M.H.T. and El Naggar, M.H., (2008). Numerical modeling of a rigid foundation on soft soil under seismic loading. *ASCE International Journal of Geomechanics,* **8**: 336-346.

B25 Rayhani, M.H.T. and El Naggar, M.H., (2008). Dynamic properties of clay & sand from centrifuge tests. *Journal of Geotechnical & Geological Engineering*, **26**:593-602.

B26 Rayhani, M.H.T. and El Naggar, M.H., (2008). Seismic response of sands in centrifuge tests. *Canadian Geotechnical Journal*, **45** (4): 470-483.

B27 Rayhani, M.H.T., Yanful, E.K., and Fakher, A., (2008). Physical modeling of desiccation-induced cracks in plastic soils. *Journal of Engineering Geology*, **97**: 25-31.

B28 Rayhani, M.H.T. and El Naggar, M.H., (2008). Characterization of glyben for seismic application. *Geotechnical Testing Journal*, ASTM, **31** (1), paper ID: GTJ100552.

B29 Rayhani, M.H.T., El Naggar, M.H., and Tabatabaei, S.H., (2007). Nonlinear analysis of local site effects on seismic ground response in the Bam earthquake. *Journal of Geotechnical and Geological Engineering,* DOI 10.1007/s10706-007-9149-0.

B30 Rayhani, M.H.T. and El Naggar, M.H., (2007). Centrifuge modeling of seismic response of layered soft clay. *Bulletin of Earthquake Eng.* **5** (4): 571-589.

B31 Rayhani, M.H.T., Yanful, E.K., and Fakher, A., (2007). Desiccation-induced cracking and its effect on the hydraulic conductivity of clayey soils. *Canadian Geotechnical Journal*, **44**: 276-283.

B32 Rayhani, M.H.T. and El Naggar, M.H., (2006). Collapse hazard zonation of Qanats in greater Tehran area. Journal *of Geotechnical & Geological Engineering,* **25** (3): 327-338.

B33 Fatemi S.M., Rayhani M.H.T., Yasrebi S.S., (2004). Evaluation of mechanical behavior of rock fill materials using tri-axial & direct shear tests. *Journal of science*, **2** (3): 13-22.

B34 Rayhani M.H.T., Fakher A., and **Hasanpour M.**, (2005). Cracking and self-healing in clays. *Journal of Building Eng. & Housing Science,* Building & Housing Research Center, **7** (3):17-36 (Persian).

B35 Rayhani M.H.T., Farajpour V., Shiroodi S.K., (2004). Qanat collapse modeling in Tehran area. *J. of Building Eng. & Housing Science*, Building & Housing Research Center, **4** (2): 41-56 (Persian).

B36 Rayhani M.H.T., (2003). Effect of lithology on mechanical behavior of rockfill materials. *Journal of Building Eng. and Housing Science*, Building and Housing Research Center, **2** (1): 63-82 (Persian).

Refereed Conference Papers

C1 **Aldaeef A.**, and Rayhani, M.T., (2018). Influence of exposure temperature on shaft capacity of steel piles in ice-poor and ice-rich frozen frozen soils. Proceeding of GeoMEast 2018 Conf., Egypt.

C2 **Aldaeef A.**, and Rayhani, M.T., (2018). Impact of ground warming on pile-soil interface strength in ice-poor frozen soils. Proceeding of GeoEdmonton 2018 Conf., Edmonton, Alberta.

C3 **Aldaeef A.**, and Rayhani, M.T., (2017). Creep behaviour of frozen Leda clay under combined compression stress and thermal exposure. Proceeding of GeoOttawa 2017 Conf., Ottawa.

C4 **Torabi, H.,** and Rayhani, M.T., (2017). Derivation of equivalent-linear pile head impedance functions for pile-supported bridges from continuum model**.** 3rd Int. Conf. on Performance-based Design in Earthquake Geotechnical Engineering (PBD-III), July 16-19, Vancouver, BC, Canada.

C5 **Adom G.**, Braimah, A., and Rayhani, M.T., (2017). Effects of impact loading on performance of pile foundations for anti-ram bollards. 96th Annual Transportation Research Board, Issue: 17-01065.

C6 **Aldaeef A.**, and Rayhani, M.T., (2016). Evolution of adfreeze strength of pile foundations in warming permafrost. Proceeding of GeoVancouver 2016 Conference, Vancouver, Canada (Best Paper Award).

C7 **Adom G.**, Braimah, A., and Rayhani, M.T., (2016). Influence of fins on lateral capacity of pile foundations for bollards. Proceeding of GeoVancouver 2016 Conference, Vancouver, Canada.

C8 **Sardon M.**, Simms, P., and Rayhani, M.T., (2016). Combined evaporation and freeze-thaw effects in polymer amended mature fine tailings. Proceed. of GeoVancouver 2016 Conf., Vancouver, Canada.

C9 **Hosseini, A.**, and Rayhani, M.T., (2015). Evolution of pile shaft capacity over time in marine sensitive clay. *Proceeding of GeoQuebec 2015 Conference,* Sep. 20-22, Quebec, Canada

C10 **Aldaeef, A.**, and Rayhani, M.T., (2015). Pile capacity in warming permafrost. *Proceeding of GeoQuebec 2015 Conference*, Sep. 20-22, Quebec, Canada

C11 **Aldaeef, A.**, and Rayhani, M.T., (2014). Hydraulic performance of compacted clay liners in landfill application. Accepted for presentation in GeoRegina 2014 Conference, Regina, Canada.

C12 **Yari, M., Aldaeef, A.**, and Rayhani, M.T., (2014). Effect of soil salinity on shear strength of Leda clay. Accepted for presentation in GeoRegina 2014 Conference, Regina, Canada.

C13 **Aldaeef, A.**, and Rayhani, M.T., (2013). Effect of daily thermal cycles on hydraulic performance of compacted clay liners. GeoMontreal 2013 Conference, Montreal, Canada.

C14 **Torabi, H.**, and Rayhani, M.T., (2013). Finite element modelling of nonlinear seismic site response in soft clay. GeoMontreal 2013 Conference, Montreal, Canada.

C15 **Giraldo, J.,** and Rayhani, M.T., (2013). Bearing capacity of hollow FRP piles in clay. Accepted for presentation in GeoMontreal 2013 Conference, Montreal, Canada.

C16 **Sarabadani, H.**, and Rayhani, M.T., (2013). Feasibility analysis of using Geosynthetic Clay Liners s in tailing dams. Submitted to Annual Conference of Canadian Dam Association, Montreal. Canada.

C17 Rayhani, M.T., & **Sarabadani, H.**, (2013). Factors affecting hydration of Geosynthetic Clay Liners in landfill applications. Proceed. of the 18th Int. Conf. on Soil Mechanics and Geotech. Eng., Paris 2013.

C18 Braimah, A., von Rosen, B., Li, Y., and Rayhani, M., (2012). Explosive cratering on Embankment dams. Proceed. of Canadian Dam Association Annual Conference, Saskatoon, Sep. 22-27, 2012.

C19 **Sarabadani, H.,** and Rayhani, M.T., (2012). Shrinkage of geosynthetic clay liners under simulated landfill conditions. *Preceeding of GeoManitoba 2012*, Sep. 2012, Manitoba, Canada.

C20 Rayhani, M.T., (2012). Hydration of geosynthetic clay liners from underlying subsoil. *Proceeding of Geocongress 2012*, March 2012, Oakland, California.

C21 **Sarabian, T***, and Rayhani, M.T., (2011). GCL hydration from clay subsoil under isothermal conditions. *Int. Conf. on Environ. Pollution & Remediation,* Ottawa, Aug. 17-19.

C22 Rayhani, M.T., **Anderson, R*** and Rowe R.K., (2011). GCL hydration from a clayey sand subsoil. *PanAmerican Canadian Geotechnical Conference*, Toronto, Sep. 2011.

C23 Rayhani M.T., Rowe R.K, Take A., Brachman R.W.I., and Siemens G., (2009). Prototype modeling of GCL hydration and shrinkage under simulated field conditions. *Geosynthetics 2009*, Salt Lake City.

C24 Rayhani M.T., Rowe R.K, Brachman R.W.I., Siemens G., and Take A., (2008). Closed-system investigation of GCL hydration from subsoil. 61st Canadian Geotechnical Conf., Edmonton.

C25 Rayhani M.T., and El Naggar M.H., (2008). Physical and numerical modeling of dynamic soil-structure interaction. *Geotechnical Earthquake Eng. & Soil Dyn. IV,* May 2008, Sacramento, USA.

C26 Rayhani M.T., and El Naggar M.H., (2007). Effect of local site condition and SSI on earthquake input motion. *9th Canadian Conf. on Earthquake Eng*., Ottawa.

C27 Rayhani M.H.T., El Naggar M.H., (2007). Centrifuge modeling of seismic soil-structure interaction in soft soil. *5th Int. Conf. on Earthquake Eng,* IIEES, Iran.

C28 Rayhani M.T., and El Naggar M.H., (2006). Centrifuge modeling of seismic response of soft clay. *1st European Conf. on Earthquake Eng.*, Geneva, Switzerland.

C29 Rayhani M.T., and El Naggar M.H., (2006). Seismic response of loose sand in centrifuge container. *59th Canadian Geotechnical Conference,* Vancouver.

C30 Rayhani M.T., El Naggar M.H., (2005). Geotechnical aspects of Bam earthquake in Iran. *POLO Earthquake Engineering Seminar*, Queen's University, Canada.

C31 Rayhani M.T., (2003). Assessment of mechanical behavior of rock fills using tri-axial and direct shear tests. *5th Int. conference on Geo-materials*, Lyon, France.

C32 Rayhani M.T., (2002). Geotechnical aspects of 22 June 2002 Changooreh earthquake in Iran. *12th Symposium on Earthquake Eng.*, IIT Roorkee, India.

C33 Rayhani M.T., Fatemi S.M., Yasrebi S.S., (2002). Assessment of rock quality on mechanical behavior of rock fills. *9th Conf. of Eng. Geology,* Durban, South Africa.

C34 Rayhani M.T., Fatemi S.M., (2001). Evaluation of mechanical behavior of rock fill materials using tri-axial test. *Aggregate Conf.*, University of Technology, Finland.

Non-Refereed Publications

D1 Braimah, A., and Rayhani, M., (2012). How explosives affect embankment dams. Hydrovision International, March-April 2012, p. 20-29.

Patents

E1 Abou El Hosn, G., and **Rayhani, M.T.** (2015): Hook Pile Foundation System: An innovative deep foundation system; EFS ID 23912790, Application Number: 62247257, Confirmation Number: 5609.

E2 Safari, E., and **Rayhani, M.T.** (2016): GRAFTA, Graphene-based Adsorptive Filter for TerrAqua Solutions. A nanotechnology-based filter system for contaminant removal, Patent No: US 62/310, 127.