Rakesh J. Pillai

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Civil Engineering
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Education

Degree	Institute	Year of Graduation
Ph.D in Civil Engineering	Indian Institute of Technology Madras	2012
B.Tech in Civil Engineering	Mahatma Gandhi University, Kerala	2005

PhD Dissertation

Effect of microfabric on static and cyclic behavior of clays

Supervisors: Prof. R. G. Robinson, Prof. A. Boominathan,
Department of Civil Engg., IIT Madras

Experience

Position	Institute	Duration
Project Officer	Nanyang Technological University Singapore	Sep 2012 - Oct 2013
Assistant Professor	National Institute of Technology Warangal	Dec 2013 - June 2019
Assistant Professor	Indian Institute of Technology Palakkad	July 2019 - Continuing

Research Interests

Cyclic behavior of soil, Constitutive modeling of soils, Numerical modeling of landslide run-out, Behavior of stabilized soil

Peer-Reviewed Journal Articles

1. **Rakesh J Pillai**, **R G Robinson** and **A Boominathan**, (2011). Effect of microfabric on undrained static and cyclic behavior of kaolin clay. *Journal of Geotechnical and Geoenvironmental Engineering*, 137(4), 421 - 429.
2. **Rakesh J Pillai**, **Bushra I** and **R G Robinson**, (2012). Undrained triaxial behaviour of cement treated marine clay. *Geotechnical and Geological Engineering*, DOI 10.1007/s10706-012-9605-3.
3. **Rakesh J Pillai**, **K M Nazeeh** and **R G Robinson**,(2013). Post-cyclic behavior of clayey soil. *Indian Geotechnical Journal*, DOI 10.1007/s40098-013-0042-x.
4. **Lini Dev K**, **Rakesh J Pillai** and **R G Robinson**, (2013). Estimation of critical state parameters from one dimensional consolidation and triaxial compression tests, *Indian Geotechnical Journal*, DOI 10.1007/s40098-013-0063-5.
5. **Rakesh J Pillai**, **R G Robinson** and **A Boominathan**, (2014). Undrained and drained shearing behavior of kaolinite with different microfabric, *International Journal of Geotechnical Engineering*, 8(1):10 - 20.
6. **Lini Dev K**, **Rakesh J Pillai** and **R G Robinson**, (2016).Drained angle of internal friction from direct shear and triaxial compression tests. *International Journal of Geotechnical Engineering*, DOI 10.1080/19386362.2015.1133754.
7. **P Hari Prasad Reddy**, **C H Rama Vara Prasad** and **Rakesh J Pillai**, (2017). Swelling of natural soil subjected to acidic and alkaline contamination *Perodica Polytechnica Civil Engineering*, DOI: 10.3311/PPci.8185, pp:1-10.
8. **C H Rama Vara Prasad**, **S K Vindula**, **P Hari Prasad Reddy**, **Ambili Babu** and **Rakesh J Pillai**, (2017). Swelling behaviour of kaolinitic clays contaminated with alkali solutions: A micro-level study. *Applied Clay Science*, 135: 575 - 582.
9. **Venkatesh N**, **Heeralal M** and **Rakesh J Pillai** (2018). Resilient Modulus of Clayey Subgrade Soils Treated with Calcium Carbide Residue. *International Journal of Geotechnical Engineering*, DOI: 10.1080/19386362.2018.1512230
10. **Venkatesh N**, **Heeralal M** and **Rakesh J Pillai** (2018). Multiscale laboratory invesitgation on black cotton soils stabilized with calcium carbide residue and fly ash. *Journal of Engineering Research*, Vol 6(4), 1-15.
11. **Venkatesh N**, **Heeralal M Rakesh J Pillai** and **Sudheer Kumar Y** (2019). Permanent deformation behaviour of black cotton soil treated with calcium carbide residue. *Construction and Building Materials*, Vol 223, 441-449.
12. **Venkatesh N**, **Heeralal M** and **Rakesh J Pillai** (2020). Resilient and Permanent deformation behaviour of clayey subgrade soil subjected to repeated load triaxial tests. *European Journal of Environmental and Civil Engineering*, 24 (9), 1414-1429.
13. **V Bhavita Chowdary**, **V Ramana Murty** and **Rakesh J Pillai** (2020). Fiber reinforced geopolymer treated soft clay – An innovative and sustainable alternative for soil stabilization. *Materials Today: Proceedings*, DOI: 10.1016/j.matpr.2020.03.574
14. **V Bhavita Chowdary**, **V Ramana Murty** and **Rakesh J Pillai** (2020). Experimental evaluation of strength and durability characteristics of geopolymer stabilised soft soil for deep mixing applications. *Innovative Infrastructure Solutions*, Vol 6(1), 1-10.

15. **Kavinkumar C**, **Sureka S**, **Rakesh J Pillai** and **Heeralal M**(2021). Influence of erodible layer on granular column collapse using discrete element analysis. *Geomechanics and Geoengineering*, DOI: 10.1080/17486025.2021.1928759.

Book Chapters

1. **Rakesh J Pillai**, **R G Robinson** and **A Boominathan** (2007). Behavior of kaolinite clays under cyclic loading, *In: R. Ayothiraman and Hemanta Hazarika (eds.) Earthquake Hazards and Mitigation*, I.K. International Publishing House, New Delhi, 409-414.
2. **Raghu P** and **Pillai R J** (2019). Behaviour thresholds of quarry dust-bentonite mixes, *In: Stalin V., Muttharam M. (eds) Geotechnical Characterisation and Geoenvironmental Engineering.* Lecture Notes in Civil Engineering, Vol 16. Springer, Singapore, 235-241.
3. **Bandyopadhyay P,** and **Pillai R J** (2020) A bounding surface model for cement stabilized clay, *In: Latha Gali M., P. R.R. (eds) Geotechnical Characterization and Modelling.* Lecture Notes in Civil Engineering, vol 85. Springer, Singapore, 1005-1018.
4. **Venkatesh N**, **Ali D.**, **Pillai R J** and **Heeralal M** (2021) Strength and durability characteristics of lime stabilized black cotton soil, *In: Latha Gali M., Raghuveer Rao P. (eds) Problematic Soils and Geoenvironmental Concerns.* Lecture Notes in Civil Engineering, vol 88. Springer, Singapore, 739-750.
5. **Mahesh L**, **Pillai R J**, **Kumar G S**, and **Murty V R** (2021) Improvement of soft clay bed using fibre reinforced soil-cement columns, *In: Latha Gali M., Raghuveer Rao P. (eds) Problematic Soils and Geoenvironmental Concerns.* Lecture Notes in Civil Engineering, vol 88. Springer, Singapore, 697-710.
6. **Sumanth Kumar G**, **Ramana Murty V**, **Mahesh L** and **Rakesh Pillai J** (2021) Influence of soil-cement columns on load-deformation behaviour of soft clay, *In: Latha Gali M., Raghuveer Rao P. (eds) Problematic Soils and Geoenvironmental Concerns.* Lecture Notes in Civil Engineering, vol 88. Springer, Singapore, 711-721.

Conference Proceedings

1. **Rakesh J Pillai**, **R G Robinson** and **A Boominathan** A study of the effect of structure on engineering behavior of kaolinite, *Proceedings of National Conference on Foundations and Earth Retaining Structures*, Roorkee, 2007.
2. **Rakesh J Pillai**, **R G Robinson** and **A Boominathan** Behavior of kaolinite clays under cyclic loading, *Proceedings of International Workshop on Earthquake Hazards and Mitigation*, Guwahati, India, May 2007
3. **Rakesh J Pillai**, **R G Robinson** and **A Boominathan** Shear strength behavior of kaolinite with different microfabric, *Proceedings of Indian Geotechnical Conference (IGS 2010)*, Mumbai, 2010.
4. **Rakesh J Pillai**, **R G Robinson** and **A Boominathan** Effect of inherent anisotropy on the undrained behaviour of clays, *Proceedings of International Conference on Modelling and Simulations in Civil Engineering*, Kollam, Kerala, India, December 2013
5. **G Gnana Prasanna** and **Rakesh J Pillai** Influence of waste plastic strips on engineering behavior of soils, *Proceedings of Indian Geotechnical Conference (IGS 2014)*, Kakinada, 2014.

6. **Partha Das** and **Rakesh J Pillai** Influence of waste tyre chips on the strength and deformation characteristics of silty and clayey sand, *Proceedings of Indian Geotechnical Conference (IGS 2014)*, Kakinada, 2014.

7. **C H Rama Vara Prasad**, **P Hari Prasad Reddy**, **Rakesh J Pillai** and **Vineet Kumar** Effect of Acids on Swell Potential of Black Cotton Soil *International Geotechnical Symposium on Disaster Mitigation in Special Geoenvironmental Conditions (6IGS)*, Chennai, January 2015.

8. **Sabari Ramesh**, **Rakesh J Pillai** and **Anu Maria Antony** Analysis of rain induced slope failures using combined hydrological geotechnical model, *Proceedings of Indian Geotechnical Conference (IGS 2015)*, Pune, 2015.

9. **Ambili Babu**, **C H Rama Vara Prasad**, **P Hari Prasad Reddy**, **Rakesh J Pillai** and **Sai Kumar V** Measure to control alkali induced heave in kaolinitic soils using fly ash, *Proceedings of Indian Geotechnical Conference (IGS 2015)*, Pune, 2015.

10. **Venkatesh N**, **Heeralal M** and **Rakesh J Pillai** Effect of water content and stress levels on resilient modulus of subgrade soil, First International Conference on Recent Innovations in Engineering and Technology, Hyderabad, December 2016

11. **Pradeep Raghu** and **Rakesh J Pillai** Behaviour thresholds of quarry dust-bentonite mixes, *Proceedings of Indian Geotechnical Conference (IGS 2016)*, Chennai, 2016.

12. **Sunita Behera**, **V Ramana Murty** and **Rakesh J Pillai** Numerical analysis of 44m high MSE wall at Kanagadurga temple, Vijayawada using PLAXIS 3D, *Proceedings of Indian Geotechnical Conference (IGS 2016)*, Chennai, 2016.

13. **Venkatesh N**, **Athira Gopinath**, **Heeralal M** and **Rakesh J Pillai** Influence of moisture content and stress levels on the permanent deformation behaviour of cohesive subgrade soil, *Proceedings of Indian Geotechnical Conference (IGS 2016)*, Chennai, 2016.

14. **Sumanth Kumar G**, **V Ramana Murty**, **Mahesh L** and **Rakesh J Pillai** Influence of soil-cement columns on load-deformation behaviour of soft clay, *Proceedings of Indian Geotechnical Conference (IGS 2018)*, Bangalore, 2018.

15. **Mahesh L**, **Sumanth Kumar G**, **Rakesh J Pillai** and **V Ramana Murty** Improvement of soft clay bed using fibre reinforced soil-cement columns, *Proceedings of Indian Geotechnical Conference (IGS 2018)*, Bangalore, 2018.

16. **Paromeeta B** and **Rakesh J Pillai** A bounding surface model for cement stabilized clay, *Proceedings of Indian Geotechnical Conference (IGS 2018)*, Bangalore, 2018.

17. **Venkatesh N**, **Danish Ali**, **Rakesh J Pillai** and **Heeralal M** Strength and durability characteristics of lime stabilized black cotton soil, *Proceedings of Indian Geotechnical Conference (IGS 2018)*, Bangalore, 2018.

18. **V Bhavita Chowdary**, **Aravind G**, **V Ramana Murty** and **Rakesh J Pillai** Geopolymer stabilization of soft clays - an emerging technique, *Proceedings of Indian Geotechnical Conference (IGS 2019)*, GeoINDUS, Surat, 2019.

19. **Kavinkumar C**, **Sureka S** and **Rakesh J Pillai** Study of dry granular flow behavior with and without erodible layer, *Proceedings of Indian Geotechnical Conference (IGS 2020)*, Visakhapatnam, 2020.

20. **Balaji Bandaru** and **Rakesh J Pillai** Viscoplastic modelling of soft sensitive soil, *Proceedings of Eight Indian Young Geotechnical Engineers Conference (8IYGEC 2021)*, Chennai, 2021.

Research Experience

Worked as project officer in School of Civil and Environmental Engineering, Nanyang Technological University, Singapore (September 2012 - October 2013).

- **Project:** Feasibility study of underground cavern construction for Underground Science City in Singapore
- Work involved:
  - ◇ Assess the major geologic risks involved in the construction of cavern network
  - ◇ Carry out finite element simulations of tunnelling through rock formations

Teaching Experience

- Assistant Professor, Department of Civil Engineering, NIT Warangal, Telangana (December 2013 - June 2019)

PhD & M.Tech Guidance

	Completed	On-Going
PhD	2	4
M.Tech	27	4

Topics of Research - PhD Guidance

1. Studies on resilient and permanent deformation behaviour of flexible pavement layers
2. Application of geopolymer soil columns for soft ground improvement
3. Numerical Modelling of landslide run out and debris flow
4. Probabilistic slope stability analysis and landslide susceptibility
5. Behaviour of very soft clays and ground improvement
6. Constitutive Modelling of cemented clays

Courses Taught (at NIT Warangal)

- **B. Tech - Civil Engineering**
  - ◇ Building Planning and Construction (IV Semester, Core course)
  - ◇ Building Technology (VIII Semester, Open Elective)
  - ◇ Ground Improvement Techniques (VIII Semester, Departmental Elective)
- **M. Tech - Geotechnical Engineering**
  - ◇ Computational Methods in Geotechnical Engineering (I Semester, Elective)
  - ◇ Earthquake Geotechniques (II Semester, Elective)
  - ◇ Design with Geosynthetics (II Semester, Elective)

Courses Taught (at IIT Palakkad)

- **B. Tech - Civil Engineering**
  - ◇ Building Drawing (III Semester, Core course)
  - ◇ Geology and Soil Mechanics (IV Semester, Core course)
  - ◇ Geotechnical Engineering (V Semester, Core course)
- **M. Tech - Geotechnical Engineering**
  - ◇ Soil Dynamics and Earthquake Engineering (I Semester, Elective)
  - ◇ Finite Element Method in Geotechnical Engineering (II Semester, Elective)