Dr. AVINASH KUMAR SINGH

Assistant Professor,
Indian Institute of Technology (ISM) Dhanbad,
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EDUCATION

Indian Institute of Technology Roorkee, Roorkee

Ph.D., Geotechnical Engineering — Dec, 2021

Thesis: Response of Geomaterials of two layered pavement structures under static and cyclic loadings.

Supervisor: Dr. J.P Sahoo (Assoc. Professor, IIT Kanpur)

Indian Institute of Technology Roorkee, Roorkee

M.Tech., Geotechnical Engineering — July, 2017

Thesis: Application of Geosynthetics in design and construction of unpaved roads

Supervisor: Dr. S. Mittal (Professor, IIT Roorkee)

National Institute of Technology Tiruchirappalli, Tiruchirappalli — July, 2013

B.Tech. , Civil Engineering

RESEARCH AREAS/INTERESTS

- Pavement Geotechnics
- Characterization of subgrade soils and granular materials under cyclic loadings
- Stabilization of problematic soils using non-traditional l additives
- Alternative non-carbon materials and Geopolymers for sustainable infrastructures
- Ground improvement techniques
- Numerical modelling of pavements structure and constitutive modelling

TECHNICAL SKILLS

- ***Programming Languages:*** *C, C++ and MATLAB.*
- ***Software Packages:*** *ABAQUS, PLAXIS-3D, SPSS Statistics, and ANSYS-CFX.*

PUBLICATIONS

Peer-Reviewed Journals:

1. Dixit, A., Mishra, A., **Singh, A.K***, Das, S.K. 2024. "Experimental and modelling studies for deformation characteristics of coal mines overburden soil under cyclic loadings in construction of haul roads". ***International Journal of Geomechanics, ASCE,*** 25(3); 06025001-11
2. Mishra, A., Dixit, A., **Singh, A.K***, Das, S.K. 2024. "Strength, deformation, and environmental impact assessment of cement stabilized mine overburden soil". ***Journal of Cleaner Production***, 447; 141475. doi.org/10.1016/j.jclepro.2024.141475. (IF = 11.1)
3. **Singh, A.K.,** Sahoo, J.P. 2023. "Untrained cyclic loading response of subgrade soil subjected to varying moisture content and stress level." ***International Journal of Geomechanics, ASCE***, 23(2); 04022284. https://doi.org/10.1061/IJGNAI.GMENG-6536. (IF = 3.918).
4. **Singh, A.K.**, Sahoo, J.P. 2022. "Experimental modelling for time dependent strength behaviour of lignosulfonate treated high plastic clay." ***Journal of Materials in Civil Engineering, ASCE***, 34(7); 06022203. https://doi.org/10.1061/ (ASCE) MT.1943-5533.0004292. (IF = 3.651)
5. Sahoo, J.P., **Singh, A.K**. 2022. "Prediction models for computation of deformations and interface stresses in a two layered pavement structure." ***International Journal of Geomechanics, ASCE,*** 22(1); 06021034. https://doi.org/10.1061/ (ASCE) GM.1943-5622.0002246. (IF= 3.918).
6. **Singh, A.K**., Sahoo, J.P. 2021. "Undrained cyclic response of lignosulfonate treated high plastic clay." ***Soil Dynamics and Earthquake Engineering***." 150: 106943. (IF= 4.0).
7. **Singh A.K**., Sahoo, J.P. 2021. "A study of the performance of Lignosulfonate treated high plastic clay under static and cyclic loading." ***Bulletin of Engineering Geology and Environment,*** 80: 8265-8278, DOI: 10.1007/s10064-021-02444-7. (IF= 4.130)
8. **Singh, A.K**., Sahoo, J.P., 2021. "Rutting prediction models for flexible pavements: historical and recent developments." ***Journal of Traffic and Transportation Engineering (English edition),*** 24(1); 23-46. https://doi.org/10.1016/j.jtte.2021.04.003. (IF= 7.9)
9. **Singh, A.K**., Sahoo, J.P. 2020. "Analysis and design of two layered flexible pavement system: a new mechanistic approach." ***Computers and Geotechnics,*** 117: 103238.1-103238.11. https://doi.org/10.1016/j.compgeo.2019.103238. (IF= 5.30)
10. **Singh, A.K**., Mittal, S. 2018. "Analysis and design of reinforced unpaved roads by modified structural number method." ***International Journal of Geosynthetics and Ground Engineering,*** 4(1): 1-8. https://doi.org/10.1007/s40891-017-0115-5. (Impact factor = 2.9).

** Corresponding author*

Conferences/Proceedings/Symposiums:

1. **Singh A.K. and Sahoo, J.P. (2023).** Application of non-traditional bio-based additives in the stabilization of foundation soil under static and cyclic loadings. 2nd International Congress on CREST, November 20-22, 2023. Place: Fukuoka, Japan.
2. **Singh A.K. and Dixit, A. (2023).** Application of OB soil in construction of haul roads. Indian Geotechnical Conference, December 14-16, 2023. Place: IIT Roorkee, India.

EXPERIENCE

- **Assistant Professor (March, 2022 – present)**
  Department of Civil Engineering. Indian Institute of Technology (Indian School of Mines) Dhanbad, India
- **Lecturer (July, 2014 – May, 2015)**
  Department of Civil Engineering. Lovely Professional University, Phagwara, Punjab.
- **Graduate Trainee Engineer (July, 2013 – May, 2014)**
  Gannon Dunkerly & Co. Ltd., Chidambaram, Tamilnadu.

PROJECTS (RESEARCH AND CONSULTANCY)

Research

1. **Title of Project:** "Making subgrade layer in flexible pavements water resistant using organosilane based chemical technology". **Role**: Principal Investigator
   Amount: Rs. 17, 36, 000.00/-
   Funding Agency: Zydex Industries Pvt. Ltd.
   Status: Ongoing
2. **Title of Project:** "Investigating the application of non-traditional bio-additives in construction of cost-effective, environment friendly and sustainable flexible pavements".
   Role: Principal Investigator
   Amount: Rs. 15, 00, 000.00/-
   Funding Agency: IIT (ISM) Dhanbad (Institute Seed Grant)
   Status: Ongoing

Consultancies

1. **Title of Project:** "Characterization and Environmental Significance of Waste Tailings Generated from BHQ Beneficiation Plant of Lloyds Metals and Energy Limited and its Feasibility study of Utilization (in the form of wet and coarse tailings) for different related Industrial Use. - Scientific Study".
   Amount: Rs. 17, 70, 000.00/-
   Funding Agency: M/S Lloyds, Maharashtra.
   Status: Completed

2. **Title of Project:** "Consultancy Work for Detailed Study of Ash Pond for Structural Strengthening and Modernization of Ash Dykes".

Amount: Rs. 25, 46, 400.00/-

Funding Agency: M/s Bokaro Power Supply Company (P) Ltd.

Status: Ongoing

SELECTED ACADEMIC OUTREACH ACTIVITIES

- Team Member, Design of overlay on Allahabad-Jaunpur National Highway led by Prof. Brind Kumar, IIT BHU, Varanasi (May, 2012 – July, 2012).
- Organized a 3-Day workshop on Ground Improvement Techniques, Institution of Engineers, Roorkee Chapter, IIT Roorkee, India (August, 2016)
- Admission Discipline Coordinator, Department of Civil Engineering, Lovely Professional University, Phagwara, Punjab (August, 2014 – April, 2015).
- Institute Representative for JEE Advanced Exam 2023, June 04, 2023. IIT ISM Dhanbad.
- Guest Lecture at Department of Civil Engineering, Birsa Institute of Technology, Sindri, Jharkhand, World Engineers Day, IEI, Dhanbad Chapter, March 04, 2024.
- Reviewer for some International Journals such as IJOG ASCE, IJPRT, Acta-Geotechnica, etc.

PROFESSIONAL RESPONSIBILITIES

Teaching responsibilities and courses taught

- Course: Engineering Graphics (CEI 101) (B. Tech. 1st and 2nd Semester) IIT (ISM) Dhanbad.
  Course Coordinator & Instructor (August, 2022 - May 2024).
- Course: Engineering Graphics Practical (March, 2022 – May 2024)
  Course Coordinator & Instructor (August, 2022 - May 2024).
- Course: Surveying (CEC201), (B. Tech. 3rd Semester) IIT (ISM) Dhanbad.
  Course Instructor (August, 2022- Present).
- Course: Surveying Practical (CEC210), (B. Tech. 4th Semester) IIT (ISM) Dhanbad.
  Course Instructor (January, 2023- Present).
- Course: Advanced Foundation Engineering (CED 529), IIT (ISM) Dhanbad.
  Course Instructor (January, 2024- Present).
- Course: Highway Engineering (JC 202 529), Lovely Professional University, Punjab.
  Course Instructor (August,, 2014- April, 2015).

Administrative responsibilities

- Member, Department Undergraduate Committee (DUGC) IIT (ISM) Dhanbad
- Member, Department Grievance Redressal Committee (DGRC), IIT (ISM) Dhanbad

Research Guidance (only PG level)

- Ph.D Students: 03

S. No.	Name/Admn. No.	Topic	Role, Status
1	Ritesh Das/ 22DR0190	Application of alkali activated geopolymers in subgrade soils and granular layers of flexible pavements	Sole, Ongoing
2	Mrinal Kuiry/ 22DR0165	Industrial wastes as alternative filler and alternative bio-additives for asphalt layer.	Sole, Ongoing
3	Khusboo Kamari/23DR0075	Characterization and distress analysis of various subgrade soils and granular materials under repeated longitudinal wheel movement	Sole, Ongoing
4	Tarakant (Project Fellow)	Role of water resistant additives in subgrade layer of flexible pavements.	Sole, Ongoing

- M.Tech students: 03

S. No.	Name/Admn. No.	Topic	Role/Status
1	Ravi Ranjan/ 22MT0126	Consolidated undrained response of cement treated sand under cyclic loadings	Completed
2	Chandan Kumar/ 23MT0110	Effect of particle size and gradation on the deformation characteristics of small sized granular aggregates under cyclic loadings	Ongoing
3	Asif Nazim/23MT080	Geopolymers stabilized granular aggregates subjected to static and cyclic loadings	Ongoing
4.	Vivek Yadav	To be decided	Ongoing