

# Sumit Nandi, Ph.D. (He/Him/His)

Room No. E219, First Floor  
Rigid Pavement Division (RPD)  
CSIR – Central Road Research Institute (CSIR – CRRRI)  
Delhi Mathura Road, New Delhi – 110025, India  
snandi.crrri@csir.res.in

143/A, Ananda Palit Road  
PO Entally PS Entally  
Kolkata, West Bengal 700014, India  
Contact: +91-9123643559  
sumitnandi15@gmail.com

## EDUCATION

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### Ph.D. in Civil Engineering

Department of Civil Engineering  
Indian Institute of Technology-Roorkee, India  
Dissertation title: *Utilization of RAP Materials for the Development of Sustainable Concrete Paver Block Mixes*  
Supervisor: Prof. G. D. Ransinchung R. N.  
CGPA: 8.714/10 (Score Based on Coursework)

July 2023  
(Date of Ph.D. Defence  
July 11, 2023)  
(Ph.D. Degree Awarded  
July 28, 2023)

### M.Tech in Civil Engineering (Specialization: Transportation Engineering)

Department of Civil Engineering  
National Institute of Technology Agartala, India  
Dissertation title: *Study of Temperature-Induced Curling Stress in Concrete Pavement Constructed with Brick Aggregates*  
Supervisor: Prof. Partha Pratim Sarkar  
CGPA: 9.69/10 (First Class with Distinction)

May 2017

### B.Tech in Civil Engineering

Maulana Abul Kalam Azad University of Technology, India  
(Formerly, West Bengal University of Technology)  
CGPA: 9.43/10

May 2015

### Higher Secondary (10+2)

Subjects: Physics, Chemistry, Mathematics, Biology, English, Bengali  
West Bengal Council of Higher Secondary Education, India  
Division/Class: First

May 2010

### Secondary (10<sup>th</sup> Standard)

Subjects: Physical Science, Life Science, Mathematics, Biology, English, Bengali  
West Bengal Board of Secondary Education, India  
Division/Class: First

May 2008

## RESEARCH INTERESTS

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- Pavement material characterization
- Valorization of recycled aggregates and recycling of industrial and agricultural wastes
- Design and construction of concrete pavements
- Experimental and computational characterization of pavements
- Urban microclimate and sustainability

## WORK EXPERIENCE

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### Scientist

Rigid Pavement Division, CSIR – Central Road Research Institute, New Delhi, India

December 2025 – Present

- Research and Consultancy Projects

### Post-Doctoral Fellow

Department of Civil Engineering, Indian Institute of Technology-Gandhinagar, India

June 2023 – October 2025

- Working on an interdisciplinary research project based on experimental investigation of microclimatic effects of blue and green infrastructure, aiming towards urban heat island mitigation

- Actively involved in the establishment of laboratory facilities in the Department of Civil Engineering for characterizing pavement materials as well as mixes and studying built environment microclimates
- Co-teaching the subject “CE635: Pavement Materials and Design” to postgraduate and doctoral students, and “CE404: Transportation Engineering” to undergraduate students with my Post Doc mentor Prof. Sushobhan Sen
- Assisting in sponsored research and industrial consultancy works ranging from road condition assessments to the verification of asphalt mix designs as team lead
- Actively assisting and coordinating the organization of conferences and seminar talks at the institute

#### **Doctoral Researcher**

December 2017 – June 2023

*Department of Civil Engineering, Indian Institute of Technology-Roorkee, India*

- Developed a mix proportioning methodology and fabrication procedure for the production of concrete paver blocks using reclaimed asphalt pavement materials
- Executed laboratory experiments to test several fresh, mechanical, transport and durability properties of cement concrete mixes
- Conducted material characterization and morphological studies for different concrete ingredients and cement concrete mixes using Particle Size Analyzer, BET analysis, XRF, XRD, TGA and FE-SEM
- Analyzed the heavy metal leachability of cement concrete mixes containing hazardous materials using TCLP test
- Performed statistical analysis on experimental data sets using MS Excel and SPSS
- Actively coordinated with thesis supervisor for sponsored research and industrial consultancy works, site visits, funded projects and research article review assignments.
- Mentored and trained postgraduate students, undergraduate students and research interns and collaborated with them for different research works
- Managed and negotiated ordering for laboratory consumables, equipment's, and services, and also assisted in maintenance and organization of the laboratory
- Designed course materials and presentations, conducted laboratory classes and graded assignments for undergraduate and postgraduate courses
- Demonstrated laboratory facilities to engineers and transportation officials from government organizations as a part of their training program
- Presented research work at national and international conferences

#### **M.Tech Research Scholar**

May 2015 – May 2017

*Department of Civil Engineering, National Institute of Technology Agartala, India*

- Developed and executed small-scale experiments to determine the mechanical properties, elastic modulus, Poisson's ratio and temperature profile in concrete specimens made with brick aggregates
- Developed 3D finite element model of cement concrete pavement using experimental data in Abaqus Software and studied the temperature-induced curling stress
- Performed land use data collection for a study area using hand GPS and calculated the entropy index using ArcGIS Software
- Collaborated and coordinated with doctoral researchers and undergraduate students for research works
- Conducted laboratory classes for undergraduate students as a part of teaching assignment

### **VOCATIONAL TRAINING & INTERNSHIP**

**Engineering Summer Intern**

June 2014 – July 2014

*P.W. (Roads) Directorate, Highway Survey Division, Government of West Bengal, India*

- Worked as a team member of survey team and gathered practical experience about field survey work by Automated Total Stations (ATS) instrument, data downloading from ATS instrument, preparation of topographical and survey drawings through Auto CAD, idea of alignment of road, bridge etc. with curve setting, concept of total survey drawings of different Roads & Bridge projects along with preparation of PPR & DPR and method of land acquisition. Also worked on a traffic census project work during this summer internship

#### **Winter Trainee**

January 2014

*Public Works Department (PWD), Survey and Design Circle, Government of West Bengal, India*

- Received training on survey, demonstration of total station, and use of software packages like Auto Plotter, AutoCAD, and STAAD Pro

#### **Summer Trainee**

June 2013 – July 2013

*Central Public Works Department (CPWD), Government of India*

- Participated in a field training at the project work of C/O Permanent Campus of Indian Institute of Science Education and Research-Kolkata (IISER-Kolkata) at Haringhata, Kalyani, West Bengal, India

## **PUBLICATIONS**

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### **Peer-Reviewed Journals**

- Spatio-temporal variation of microclimate in mixed-use urban forms  
**Sumit Nandi**, Chirag Nagar, Sushobhan Sen, Keshav Bansal, and Vibhash Bhushan  
*Theoretical and Applied Climatology*, 156, 490 (2025), **2025**
- Utilization of wollastonite, jarosite, and their blends for the sustainable development of concrete paver block mixes containing reclaimed asphalt pavement aggregates  
**Sumit Nandi**, G. D. Ransinchung R. N., and Surya Kant Sahdeo  
*Environmental Science and Pollution Research*, 31, 20048–20072, **2024**
- Investigating the Suitability of Agricultural and Industrial Wastes for Production of RAP Inclusive Pervious Concrete Pavement Mixes: A Sustainable Approach  
Surya Kant Sahdeo, G. D. Ransinchung R. N., and **Sumit Nandi**  
*International Journal of Pavement Research and Technology*, 17(5), 1309–1326, **2024**
- Influence of different curing conditions on the transport, durability and microstructural properties of concrete paver block mixes containing RAP aggregates  
**Sumit Nandi** and G. D. Ransinchung R. N.  
*Innovative Infrastructure Solutions*, 8(10), 280, **2023**
- Performance Characteristics of Concrete Paver Blocks Incorporating Individual and Combined Fractions of Reclaimed Asphalt Pavement Aggregates under Different Curing Regimes  
**Sumit Nandi** and G. D. Ransinchung R. N.  
*Journal of Materials in Civil Engineering*, 35(4), 04023017, **2023**
- A Sustainable Approach Towards Reducing Cement Consumption in the Road Sector Using Zinc Industry Waste  
**Sumit Nandi**, G. D. Ransinchung R. N. and Ghan Bahadur Rana  
*International Journal of Pavement Research and Technology*, 15(6), 1463–1483, **2022**
- Laboratory investigation of Portland cement concrete paver blocks made with Reclaimed Asphalt Pavement aggregates  
**Sumit Nandi** and G. D. Ransinchung R. N.  
*Road Materials and Pavement Design*, 23(3), 546–564, **2022**

- Performance evaluation and sustainability assessment of precast concrete paver blocks containing coarse and fine RAP fractions: A comprehensive comparative study  
**Sumit Nandi** and G. D. Ransinchung R. N.  
*Construction and Building Materials*, 300, 124042, 2021

#### Conference Proceedings & Book Chapter

- Assessing the Performance of RAP Based Precast Concrete Paver Block Mixes Exposed to Continuous and Intermittent Water Curing Regimes  
**Sumit Nandi** and G. D. Ransinchung R. N.  
In Proceedings of the 7<sup>th</sup> International Conference on Civil, Structural and Transportation Engineering (ICCSTE'22), Avestia Publishing, Canada, 2022
- A Review on the Use of Alternative Materials as a Sustainable Approach in the Manufacture of Concrete Paver Blocks  
**Sumit Nandi** and G. D. Ransinchung R. N.  
In Proceedings of the Fifth International Conference of Transportation Research Group of India, Lecture Notes in Civil Engineering, 218, 93-108, Springer, Singapore, 2022
- Utilization of jarosite in precast concrete paver blocks  
**Sumit Nandi** and G. D. Ransinchung R. N.  
In Proceedings of the 11<sup>th</sup> International Conference on Road and Airfield Pavement Technology, IOP Conference Series: Materials Science and Engineering, 1075, 012024, IOP Publishing, 2021

## CONFERENCE PRESENTATIONS

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#### Oral Presentations

- 8<sup>th</sup> International Conference of the Transportation Research Group of India (CTRG 2025) held at IIT Guwahati, India, from December 17-20, 2025  
Title: Analyzing Failure Mechanisms in Concrete Block Pavements  
Ankita Singh, **Sumit Nandi**, and Sushobhan Sen
- ASCE International Conference on Challenges and Innovations for Sustainable Smart Cities (CISSC 2025) held in Chandigarh, India from February 7-9, 2025  
Title: Sky View Factor Analysis for a Compact Self-Contained Urban University Campus: A Case Study of IIT Gandhinagar  
**Sumit Nandi**, Keshav Bansal, Vibhash Bhushan and Sushobhan Sen
- 9<sup>th</sup> International Congress on Computational Mechanics and Simulation (ICCMS 2023) held in Gandhinagar, India from December 20 – 22, 2023  
Title: Reduced Order Models for Concrete Block Pavements  
**Sumit Nandi** and Sushobhan Sen
- 6<sup>th</sup> International Conference on Building Materials and Materials Engineering (ICBMM 2022) held in Barcelona, Spain from September 15 – 17, 2022  
Title: Engineering Characteristics of Time-Controlled Dual-Source Compacted RAP Inclusive Concrete Paver Block Mixes under Different Curing Conditions  
**Sumit Nandi** and G. D. Ransinchung R. N.
- 7<sup>th</sup> International Conference on Civil, Structural and Transportation Engineering (ICCSTE 2022) held in Niagara Falls, Canada from June 5 – 7, 2022  
Title: Assessing the Performance of RAP Based Precast Concrete Paver Block Mixes Exposed To Continuous and Intermittent Water Curing Regimes  
**Sumit Nandi** and G. D. Ransinchung R. N.
- 2<sup>nd</sup> ASCE India Conference on “Challenges of Resilient and Sustainable Infrastructure Development in Emerging Economies” (CRSIDE 2020) held in Kolkata, India from March 2 – 4, 2020  
Title: Feasibility of Jarosite as a sustainable alternative construction material in cement concrete pavements  
**Sumit Nandi**, G. D. Ransinchung R. N. and Ghan Bahadur Rana

- *3<sup>rd</sup> International Conference on Waste Management - RECYCLE 2020* held in Guwahati, India from February 13 – 14, 2020  
Title: Performance of Crushed Waste Brick Aggregate Rigid Pavement against Temperature Induced Stresses  
Jince P Zachariah, Partha Pratim Sarkar and **Sumit Nandi**
- *11<sup>th</sup> International Conference on Road and Airfield Pavement Technology (ICPT 2019)* held in Kuala Lumpur, Malaysia from July 10 – 12, 2019  
Title: Utilization of jarosite in precast concrete paver blocks  
**Sumit Nandi** and G. D. Ransinchung R. N.
- *1<sup>st</sup> International Conference on Transportation Infrastructure Projects Conception to Execution (TIPCE 2019)* held in Roorkee, India from January 7 – 10, 2019  
Title: Structural behaviour of concrete block pavement: A review  
**Sumit Nandi** and G. D. Ransinchung R. N.
- *4<sup>th</sup> International Conference of Transportation Research Group of India (CTRG 2017)* held in Mumbai, India from December 17 – 20, 2017  
Title: Study of temperature-induced curling stress in concrete pavement constructed with brick aggregates  
**Sumit Nandi**, Jince P Zachariah, Partha Pratim Sarkar and Manish Pal

#### Poster Presentations

- *2<sup>nd</sup> ASCE India Conference on “Challenges of Resilient and Sustainable Infrastructure Development in Emerging Economies” (CRSIDE 2020)* held in Kolkata, India from March 2 – 4, 2020  
Title: Feasibility of Jarosite as a sustainable alternative construction material in cement concrete pavements  
**Sumit Nandi**, G. D. Ransinchung R. N. and Ghan Bahadur Rana
- *5<sup>th</sup> International Conference of Transportation Research Group of India (CTRG 2019)* held in Bhopal, India from December 18 – 21, 2019  
Title: A review on the use of alternative materials as a sustainable approach in the manufacture of concrete paver blocks  
**Sumit Nandi** and G. D. Ransinchung R. N.

#### Others

- Actively participated in the *Conference on “Feminine research in the field of Civil Engineering: Valorization and Reuse of Materials, Life Cycle Analysis, Bio Sourced Materials”* organized by L2MGC - Laboratoire de Mécanique et Matériaux du Génie Civil, CY Cergy Paris University, France on March 8, 2022

### WORKSHOPS/SHORT COURSES/FACULTY DEVELOPMENT PROGRAMMES ATTENDED

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#### Workshops

- *International Virtual Workshop on “Modern Trends in Transportation System” (MTTS- 2020)* organized by Department of Civil Engineering, National Institute of Technology Silchar, Assam, India from July 25 – 29, 2020
- *Regional Workshop on “Quality Control, New Materials and Techniques in Road Sector”* jointly organized by Transportation Engineering Group, Department of Civil Engineering, Indian Institute of Technology-Roorkee and Indian Roads Congress (IRC) in Roorkee, India from February 7 – 8, 2020

#### Short Courses

- *One Week Online Short Term Course on “Recent Practices in Geotechnical and Transportation Engineering”* organized by Department of Civil Engineering, G H Raisoni College of Engineering & Management (GHRCEM), Pune, Maharashtra, India from July 26 – 30, 2021
- *Five days Online Short Term Course on “Advanced Materials for Highway Construction”* organized by Department of Civil Engineering, Punjabi University, Patiala, Punjab, India from October 16 – 20, 2020

- *Online Short Course on “Transportation Modelling and Simulation”* organized by Research Centre for Integrated Transport Innovation (rCITI), School of Civil & Environmental Engineering, University of New South Wales (UNSW) Sydney, Australia in collaboration with the Indian Academy of Highway Engineers (IAHE), Ministry of Road Transport and Highways, Government of India from August 10 – 14, 2020
- *One Week Online Short Term Course on “Emerging Trends in Highway Engineering and Infrastructure Development” (ETHEID-2020)* organized by Department of Civil Engineering, Dr B R Ambedkar National Institute of Technology Jalandhar, Punjab, India from June 23 – 27, 2020

#### Faculty Development Programmes (FDPs)

- *Online FDP on “Advances in Highway Technology and Traffic Systems”* organized by Department of Civil Engineering, Ramaiah Institute of Technology, Bengaluru, Karnataka, India from August 24 – 28, 2020
- *AICTE Training And Learning (ATAL) Academy Online Elementary FDP on “Contemporary Technologies for Sustainable Road Construction”* organized by Siksha 'O' Anusandhan deemed to be University, Bhubaneswar, Odisha, India from October 1 – 5, 2020
- *AICTE Training And Learning (ATAL) Academy Online Elementary FDP on “Recent Advances in Pavement Analysis, Design and Evaluation”* organized by Indian Institute of Technology-Jodhpur, Rajasthan, India from September 20 – 24, 2020
- *AICTE Training And Learning (ATAL) Academy Online FDP on “Construction Technology”* organized by Rajiv Gandhi University of Knowledge Technologies (RGUKT) RK Valley, Andhra Pradesh, India from September 7 – 11, 2020
- *Online FDP on “Bridging the Gap: Theory and Practices in Pavement Engineering”* organized by Department of Civil Engineering, Saintgits College of Engineering, Kottayam, Kerala, India from August 24 – 28, 2020

#### SCHOLARSHIPS & AWARDS

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|---|-------------|
| • Best Overall Paper Award for the research paper entitled “Analyzing Failure Mechanisms in Concrete Block Pavements” in the track “Pavements and Materials” presented at the 8 <sup>th</sup> Conference of the Transportation Research Group of India (CTRG 2025), held at IIT Guwahati, India, from December 17-20, 2025  | 2025        |
| • Best Paper Award for the research paper entitled “Sky View Factor Analysis for a Compact Self-Contained Urban University Campus: A Case Study of IIT Gandhinagar” in the track “Urban Planning and Development” presented at ASCE International Conference on Challenges and Innovations for Sustainable Smart Cities (CISSC 2025), held in Chandigarh, India from February 7-9, 2025 | 2025        |
| • Institute Post-Doctoral Fellowship for carrying out Post-Doctoral Research, Department of Civil Engineering, Indian Institute of Technology Gandhinagar, India  | 2023 – 2025 |
| • Institute Assistantship for Ph.D. Programme, Ministry of Education, Government of India   | 2018 – 2022 |
| • Post Graduate (PG) Gold Medal, Department of Civil Engineering, National Institute of Technology Agartala, India  | 2017        |
| • GATE Scholarship for M.Tech Programme, Ministry of Education, Government of India   | 2015 – 2017 |
| • Central Sector Scheme of Scholarship (CSSS) for College and University Students, Department of Higher Education, Ministry of Education, Government of India   | 2011        |

#### MEMBERSHIPS

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| • International Society for Concrete Pavements, Annual Membership | Oct 2022 – Dec 2023 |
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| • REUNION INTERNATIONALE DES LABORATOIRES ET EXPERTS DES MATERIAUX, SYSTEMES DE CONSTRUCTION ET OUVRAGES (RILEM), Young Member | Mar 2021 - Dec 2023 |
| • American Concrete Institute (ACI), Annual Membership   | Nov 2020 - Dec 2023 |
| • American Society of Civil Engineers (ASCE), Affiliate Membership (Transportation and Development Institute)                  | Feb 2020 – Dec 2024 |
| • Transportation Research Group of India (TRG), Annual Membership  | Nov 2019 – Dec 2023 |

## SKILLS & INTERESTS

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- Computer-aided design/engineering: Acquaintance with AutoCAD (certificate course), KenPAVE, IITPAVE, ISLAB, and Abaqus.
- Programming Languages Acquaintance: Python, C, Java
- Languages: English (professional), Bengali (native), Hindi (fluent)
- Interests: Participating in activities like drama, acting & anchoring, drawing, listening to music, watching movies, reading novels, traveling and photography, and writing review blogs

## SERVICE & OUTREACH

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| <b>Invited Reviewer for Conferences</b><br><i>International Conference on Geosynthetics and Environmental Engineering (ICGEE 2023); 13<sup>th</sup> International Conference on Concrete Pavements (ICCP 2024); 15<sup>th</sup> International Conference on Transportation Planning and Implementation Methodologies for Developing Countries (TPMDC 2024)</i>   | 2023-2024    |
| <b>Lead Student Volunteer, Catering and Tentage Management</b><br><i>2nd International Conference on Transportation Infrastructure Projects Conception to Execution (TIPCE 2022) held in Roorkee, India</i>  | 2022         |
| <b>Reviewer of Peer-Reviewed Journals</b><br><b>SCI Indexed:</b> <i>International Journal of Road Materials and Pavement Design; International Journal of Pavement Engineering; International Journal of Construction and Building Materials; Journal of Materials in Civil Engineering; Journal of Building Engineering; Case Studies in Construction Materials; Scientific Reports; KSCE Journal of Civil Engineering; Materials Research Express</i><br><b>ESCI/Scopus Indexed:</b> <i>International Journal of Pavement Research and Technology; Transportation in Developing Economies; Iranian Journal of Science and Technology-Transactions of Civil Engineering; Journal of Multiscale and Multidisciplinary Modeling, Experiments and Design; Asian Journal of Civil Engineering; Journal of Building Pathology and Rehabilitation; and Discover Civil Engineering; Discover Concrete and Cement</i> | 2021-Present |
| <b>Student Volunteer, Catering and Tentage Management</b><br><i>Regional Workshop on “Quality Control, New Materials and Techniques in Road Sector” held in Roorkee, India</i>   | 2020         |
| <b>Student Volunteer, Travel and Accommodation Management</b><br><i>1st International Conference on Transportation Infrastructure Projects Conception to Execution (TIPCE 2019) held in Roorkee, India</i>   | 2019         |
| <b>Student Volunteer, Floor Management</b><br><i>Annual Convocation of Indian Institute of Technology-Roorkee, India</i>   | 2018         |

## FEATURED AND PROFILE LINKS

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### ISCP "STUDENT RESEARCH SPOTLIGHT"

<https://www.concretepavements.org/2022/09/18/student-research-spotlight-september-2022/>

### LinkedIn

<https://www.linkedin.com/in/nandisumit/>

### ResearchGate

[https://www.researchgate.net/profile/Sumit-Nandi-3?ev=hdr\\_xprf](https://www.researchgate.net/profile/Sumit-Nandi-3?ev=hdr_xprf)

### ORCID

<https://orcid.org/my-orcid?orcid=0000-0002-1274-079X>

### SCOPUS

<https://www.scopus.com/authid/detail.uri?authorId=57219530019>

### Web of Science

<https://www.webofscience.com/wos/author/record/ABG-8598-2021>

## REFEREES

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**Dr. G. D. Ransinchung R. N.,** Professor  
Department of Civil Engineering  
Indian Institute of Technology-Roorkee, India  
Roorkee, Uttarakhand 247667, India  
Contact: +91-8126924834  
Email: g.n@ce.iitr.ac.in

**Dr. Partha Pratim Sarkar,** Professor  
Department of Civil Engineering  
National Institute of Technology Agartala, India  
Agartala, Tripura 799046, India  
Contact: +91-9774051947  
Email: ps\_partha@yahoo.com

**Dr. Sushobhan Sen,** Assistant Professor  
Department of Civil Engineering  
Indian Institute of Technology-Gandhinagar, India  
Gandhinagar, Gujarat 382355, India  
Contact: +91-9652988143  
Email: sushobhan.sen@iitgn.ac.in

**Dr. Surender Singh,** Associate Professor  
Department of Civil Engineering  
Indian Institute of Technology-Madras, India  
Chennai, Tamil Nadu 600036, India  
Contact: +91-9812955285  
Email: surender@civil.iitm.ac.in