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CIVIL ENGINEERING RESEARCH SYMPOSIUM 2026

Book of Extended Abstracts

A collection of the extended abstracts presented at the
Civil Engineering Research Symposium 2026

Organised by

Department of Civil Engineering

University of Moratuwa

Sri Lanka

8th October 2026

Proceedings of the Civil Engineering Research Symposium 2026

8th October 2026, University of Moratuwa

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University of Moratuwa

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Civil Engineering Research Symposium 2026

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Civil Engineering Research Symposium 2026

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Dr Ayomi Witharana	

Message from the Vice Chancellor

The Civil Engineering Research Symposium has become an important annual event of the Department of Civil Engineering. I was pleased to note the Department's continued enthusiasm in organising this focused research symposium, which showcases its research achievements and highlights its significant contribution to the broader research endeavours of the University.

One of the goals that the University strives to achieve is to have a thriving and sustainable research and innovation culture in our march towards a world-class university. To this end, attempts are made to attract funding from international entities, private sector funding for research investment, international collaborations and funding from other local institutions, in addition to enhanced Senate Research Grants. This is a great opportunity for the Civil Engineering Department to contribute to the development of resilient infrastructure, disaster mitigation and innovative technologies to support rapid infrastructure development of our country.

CERS provides a valuable platform for researchers, academics, students and professionals to share knowledge, present innovative research and engage in dialogue on the evolving challenges of civil engineering. I am particularly pleased that this year, the Symposium has been expanded to include researchers from other institutions, further strengthening collaboration and knowledge exchange with a wider engineering community.

Building on this progress, I would like to see the Civil Engineering Research Symposium evolve into an international conference in the coming years, attracting researchers and academics from around the world. As a next step, I encourage the Department to work towards establishing CERS as an internationally recognised conference with peer-reviewed proceedings published through a reputed indexed publication platform. Such a development would enhance the international visibility of our research and contribute to the University's aspiration to become a globally competitive and research-intensive university.

I am also pleased that this year's Symposium pays tribute to Prof. Ananda Jayawardane, whose more than four decades of distinguished service to the University of Moratuwa, as an academic, Dean of the Faculty of Engineering and Vice Chancellor, have left an enduring legacy within our university.

While expressing my appreciation to the Head of the Department of Civil Engineering and the Organising Committee for their dedicated efforts in organising this Symposium, I also congratulate all authors on their research achievements and wish the Civil Engineering Research Symposium 2026 a great success.

Prof. K.T.M.U. Hemapala

Vice Chancellor

University of Moratuwa



Message from the Dean, Faculty of Engineering

It is my great pleasure to congratulate the Department of Civil Engineering on organising the Civil Engineering Research Symposium 2026, continuing a valued tradition that has provided an important platform for showcasing and advancing research within the Department.

Over the years, CERS has evolved into a significant forum for bringing together students, academics, researchers, alumni and industry professionals to exchange knowledge and engage with emerging developments in civil engineering. I am particularly pleased to see the Symposium expanding its scope this year to provide opportunities for undergraduate and postgraduate researchers from universities across Sri Lanka to share their work and engage with the wider academic and professional community.

Civil engineering continues to play a fundamental role in the sustainable development of our country, addressing challenges relating to infrastructure, the built environment, resilience, sustainability and the responsible use of resources. In this context, research that combines scientific rigour with practical relevance is increasingly important. A forum such as CERS provides an excellent opportunity not only to disseminate new knowledge but also to strengthen the connection between university research and the evolving needs of industry and society.

The Department of Civil Engineering has continued to strengthen its contribution to the University through excellence in undergraduate and postgraduate education, research, innovation, industry engagement and professional service. Its academic staff contribute their expertise to research and consultancy, as well as to national initiatives involving engineering, technology and policy, while students benefit from strong exposure to contemporary engineering practice and research.

I am confident that CERS 2026 will further encourage a culture of inquiry, innovation and applied research among our students and young researchers, while fostering stronger collaboration between universities, industry and the profession.

A special highlight of this year's Symposium is the Valedictory Lecture by Prof. Ananda Jayawardane, recognising more than four decades of distinguished service and his lasting contribution to the University and engineering education in Sri Lanka.

I extend my sincere appreciation to the Head of the Department of Civil Engineering, the Co-chairs and members of the Organising Committee, the editors, reviewers, academic staff and all others who have contributed to making this Symposium possible. I also congratulate all authors and presenters on their research achievements and wish the Civil Engineering Research Symposium 2026 every success.

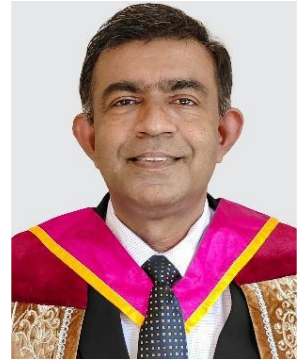
Prof. Jagath Manatunge

Dean, Faculty of Engineering
University of Moratuwa



Message from the Head of the Department

It is my great pleasure to welcome all participants to the Civil Engineering Research Symposium 2026, organised by the Department of Civil Engineering, University of Moratuwa. This year marks an important milestone in the evolution of CERS, as we welcome researchers and academics from other universities and institutions, creating a broader platform to share knowledge, present research findings, and exchange ideas on emerging challenges and opportunities in civil engineering.



This year's Symposium is particularly special as we honour Prof. Ananda Jayawardane for his outstanding service to the University of Moratuwa spanning more than four decades. Prof. Jayawardane has contributed immensely to the education of generations of civil engineers, particularly through his teaching in Construction Management, and has provided distinguished academic leadership as Dean of the Faculty of Engineering and Vice Chancellor of the University of Moratuwa. His long and dedicated service has made a lasting contribution to our Department, Faculty and University, and we are privileged to recognise his remarkable contribution at CERS 2026.

As we celebrate this legacy, we must also look towards the future. Civil engineering is undergoing rapid transformation through artificial intelligence, digitalisation, automation, advanced materials, data-driven engineering, and new approaches to sustainable and resilient infrastructure. These developments present both opportunities and challenges, requiring us to rethink how we conduct research, educate future engineers and translate knowledge into practice. At the same time, innovation must remain firmly grounded in engineering fundamentals, professional responsibility, ethics and the needs of society.

I hope CERS 2026 will encourage our students and researchers to embrace new ideas and technologies, work across disciplinary and institutional boundaries, and pursue research that is innovative, responsible and relevant to the challenges of our time.

On behalf of the Department of Civil Engineering, I extend my sincere appreciation to Prof. Ananda Jayawardane for his exceptional service and enduring contribution to the University of Moratuwa and the civil engineering profession. I wish all presenters, researchers, academics, industry professionals, and participants a stimulating and successful CERS 2026.

Prof. Udeni Nawagamuwa

Head, Department of Civil Engineering
University of Moratuwa

Preface and Acknowledgements

The Civil Engineering Research Symposium has, since its inception in 2011, provided a platform for undergraduate researchers of the University of Moratuwa to present their work to industry professionals and the academic community. CERS 2026 marks an important new phase in this journey, with the Symposium expanding its scope to include undergraduate and postgraduate research from universities across Sri Lanka. Through this broader national participation, CERS 2026 seeks to provide a platform for emerging researchers to present innovative ideas, share recent technological developments, exchange knowledge, and establish valuable connections with industry, academia, and policymakers.

This volume comprises 39 extended abstracts, each accompanied by a graphical abstract, organised under five thematic areas: Smart and Resilient Structures (11); Next-Generation Materials and Smart Construction (7); Environmental Sustainability and Climate Resilience (15); Intelligent Mobility and Transportation Systems (2); and Geotechnical, Water Resources, and Geospatial Technologies (4). Together, these contributions reflect the breadth of contemporary civil engineering research and highlight the growing emphasis on resilience, sustainability, digital technologies, advanced materials, and intelligent infrastructure.

All submissions were managed through the Microsoft Conference Management Toolkit (CMT) and subjected to a double-blind peer-review process. Authors of accepted extended abstracts subsequently submitted revised camera-ready versions incorporating the comments and recommendations of the reviewers. We sincerely thank all authors for their valuable contributions and for sharing their research through CERS 2026. We are equally grateful to the reviewers, whose careful assessments, constructive comments, and generous contribution of time and expertise have been essential in maintaining the quality of these proceedings.

Another key feature of this year's Symposium is the Live Three-Minute Thesis (3MT) Challenge, in which five presenters selected from the previously conducted round-robin session will compete live, communicating the significance and impact of their research through concise and engaging three-minute presentations.

CERS 2026 is made especially significant by the opportunity to honour Prof. Ananda Jayawardane in recognition of more than four decades of distinguished service to the University of Moratuwa. Through his teaching, academic leadership, and service as Dean of the Faculty of Engineering and Vice Chancellor of the University, he has made a lasting contribution to engineering education and to generations of civil engineers. We are deeply grateful to Prof. Jayawardane for delivering the Valedictory Lecture at this year's Symposium, making the occasion particularly memorable.

We also extend our sincere appreciation to our Chief Guest, Dr Patrick McNamara, Executive Director of the United States–Sri Lanka Fulbright Commission, for graciously accepting our invitation and joining us at the inauguration of CERS 2026.

The Symposium is held with the support and encouragement of the Vice Chancellor of the University of Moratuwa, the Dean of the Faculty of Engineering and the Head of the

Department of Civil Engineering, to whom we extend our sincere gratitude. We gratefully acknowledge the financial support provided by the Faculty of Graduate Studies (FGS), University of Moratuwa, towards the successful conduct of CERS 2026. We are grateful to the academic and non-academic staff of the Department, the student volunteers, all members of the Organising Committee, and our partners and sponsors for their generous and continued support.

On behalf of the Organising Committee

Prof. Chinthaka Mallikarachchi

Symposium Co-chair

Dr Chathura Rajapakse

Symposium Secretary

Dr Kanishka Chandrathilaka

Editor-in-Chief

Symposium Agenda

8th October 2026

Venue: Civil Engineering Auditorium, University of Moratuwa

08:00 – 08:30	Registration
08:30 – 08:35	Lighting of the Oil Lamp
08:35 – 08:40	National Anthem
08:40 – 08:50	Welcome Address by the Head, Department of Civil Engineering
08:50 – 08:55	Address by the Dean, Faculty of Engineering
08:55 – 09:00	Address by the Vice Chancellor, University of Moratuwa
09:00 – 09:30	“The Value of Values in Higher Education: Reflections from an Interdisciplinary Leader” Address by the Chief Guest Dr Patrick McNamara, Executive Director, United States–Sri Lanka Fulbright Commission
09:30 – 10:00	“Need Seed matching for industry competitiveness” Valedictory Lecture by Prof. Ananda Jayawardane Senior Professor, Department of Civil Engineering
10:00 – 10:15	Recognition of Student Excellence: Publications in Q1/Q2 Journals
10:15 – 10:30	Acknowledgement of Partners
10:30 – 11:00	Morning Tea
11:00 – 12:30	Technical Presentation: Morning Session
12:30 – 13:30	Lunch
13:30 – 15:15	Technical Presentation: Afternoon Session
15:15 – 15:45	Three-Minute Thesis Challenge: Live Final
15:45 – 15:50	Concluding Remarks and Vote of Thanks
15:50 – 16:15	Afternoon Tea

Chief Guest



Dr Patrick McNamara

Executive Director,
United States–Sri Lanka Fulbright Commission

Patrick McNamara, PhD, serves as Executive Director of the United States–Sri Lanka Fulbright Commission. He has worked with universities, governments, corporations, nonprofits and foundations for over 35 years. Before joining Fulbright Sri Lanka, he was at the University of Nebraska at Omaha (UNO), where he taught conflict resolution, sustainable development and social entrepreneurship. At UNO, he served as Senior International Officer, Director of the International Studies major and minor, Director of the Sustained Dialogue Initiative and Director of the Omaha World Affairs Council.

Dr McNamara earned a PhD from the School of Public Administration at UNO, an MSc in Conflict Analysis and Resolution from George Mason University, and a BA in Religion from Swarthmore College, where he studied comparative religions and ethics.

His address is titled “The Value of Values in Higher Education: Reflections from an Interdisciplinary Leader”.

Valedictory Lecture: “Need Seed matching for industry competitiveness”



Prof. Ananda Jayawardane

Professor, Department of Civil Engineering, University of Moratuwa

Professor Ananda Jayawardane is a distinguished academic, visionary leader and pioneering administrator who has shaped the University of Moratuwa through a career of more than four decades. His contributions span teaching, research, institutional governance and industry collaboration, and he has served the University as Head of two departments, Dean of the Faculty of Engineering and Vice Chancellor.

He graduated with First Class Honours in Civil Engineering from the University of Moratuwa in 1983, and obtained his MSc in Construction (1986) and PhD in Construction Management (1990) from Loughborough University of Technology, UK, followed by training in Technology Management at the Asian Institute of Technology, Thailand. He joined the Department of Civil Engineering as an Assistant Lecturer in 1984, and was promoted to Senior Lecturer in 1990, Associate Professor in 1998, Professor in 2001 and Senior Professor in 2009.

He was the founding Head of the Department of Management of Technology (1998 to 2002), where he launched the University’s first MBA programme, and Head of the Department of Civil Engineering (2002 to 2004). In the latter role he introduced student mentoring and industry-based leadership programmes, which have since become standard practice across the University, together with the 5S productivity programme and peer observation of teaching, well before formal quality assurance systems were in place. He was the lead architect of the University’s first participatory Corporate Plan (2001 to 2006), and subsequently led its strategic planning four times, covering the period 2007 to 2021.

As Dean of the Faculty of Engineering (2004 to 2010), he increased student intake by 35% while maintaining academic quality, established the Department of Transport and Logistics Management, secured the Faculty’s first endowed professorship, institutionalised departmental and faculty industry consultative boards, and ensured that the engineering degree programmes obtained Washington Accord accreditation.

As Vice Chancellor (2011 to 2017), he led a systemic transformation of the University. The Faculty of Graduate Studies and the Faculty of Business were established, the latter introducing

the Bachelor of Business Science, a pioneering degree in the national university system, and the foundation was laid for the Faculty of Medicine. He established the Enterprise Innovation and Entrepreneurship Incubator and seven focused research centres, and oversaw a major expansion of the University's land, buildings and infrastructure.

His service to the nation includes membership of the University Grants Commission (2020 to 2024), chairmanship of the Committee of Vice-Chancellors and Directors (2014), and membership of the councils of the National Institute of Education and the National Education Commission. He was President of the Institution of Engineers, Sri Lanka (2010 to 2011), and has served as Chairman of the Commercial Bank of Ceylon PLC and as a director of organisations including the Construction Industry Development Authority, HNB Life PLC, Sierra Cables PLC, the State Engineering Corporation and the Bank of Ceylon.

He is a Chartered Engineer, an International Professional Engineer, and a Fellow of the Institution of Engineers, Sri Lanka, the Institute of Project Managers, Sri Lanka, and the National Academy of Sciences of Sri Lanka. He is also a Founder Member of the Society of Structural Engineers, Sri Lanka, a Life Member of the Sri Lanka Association for the Advancement of Science and a Graduate Member of the Sri Lanka Institute of Directors. His awards include the IESL Award for Eminence in Engineering (2018), the highest lifetime award of the Institution for the practice of engineering, several awards for outstanding contribution to education from the World Education Congress and CMO Asia (2016 to 2018), and the National Achiever's Award for Engineering from the Lions Clubs International (2013).

Three-Minute Thesis (3MT) Challenge: Finalists



J.H.M.Y.U. Jayapathma

Effect of Particle-Size Distribution on the Resilient Modulus of Tunnel Muck for Pavement Applications



K.I. Keshani

T-Shaped Deep Mixing Method for Soft Ground Improvement



P.H.T. Punchihewa

Seismic Vulnerability Assessment of Residential Buildings in Sri Lanka



V.O. Ratnayake

Listening to a Heated Conversation



L.A.D.T. Senaratne

Buckling Behaviour of Cold-Formed Steel Z-Sections under Axial Compression and Bi-Axial Bending

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