

EESD 2025

Engineers as Changemakers

The 12th International Conference on

Engineering Education for Sustainable Development

Engineers as Changemakers

King's College London 15-18 June 2025

www.eesd2025.org



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Whitbybird Foundation

The SIEMENS logo is centered within a light gray rectangular box. The word 'SIEMENS' is written in a bold, teal-colored, sans-serif font.



Programme

Venue

King's College London

Great Hall & Edmond J. Safra Lecture Theatre (King's Building)

Enter through the Main Reception on Strand (next to St Mary le Strand)

Sunday 15 June 2025

- **5.15 pm – Opening remarks & Welcome Address (registration open from 4 pm)**
- **6.00 pm – Leo Jansen Prize Lecture**
Prof Edmond Byrne, University College Cork – Recipient of the 2023 Leo Jansen Prize
- **7.00 pm – Welcome Reception**
An informal evening to connect with colleagues and meet new faces in the EESD community
- **8.00 pm – Dinner on own**

Monday 16 June 2025

Morning: 9 am – 1 pm

- **9.00 am – Welcome & practical information**
- **9.15 am – Opening Keynote Address**
Dr Michael K. J. Milligan, CEO of ABET
- **10.15 am – Information about the Gala Dinner & Dinner Carousel**
- **10.30 am – Break & refreshments**
- **11.00 am – Parallel Sessions (presentation sessions A-D & workshops 1-2)**

Lunch: 1 pm – 2 pm

Afternoon: 2 pm – 5 pm

- **2.00 pm – Keynote Address**
Emma Crichton, Engineers Without Borders UK
Prof Sarah Hitt, Engineering Professors' Council / NMITE
- **3.00 pm – Break & refreshments**
- **3.30 pm – Plenary Panel #1: Education in Focus**
This panel takes a critical look at the current state of engineering education.
Dr Michael Milligan, CEO of ABET
Prof Sarah Hitt, NMITE and Engineering Professors Council
Dr Tanya Morton, Global Director of Customer Success Engineering, MathWorks
- **4.45 pm – Closing remarks**
- **5.00 pm – Time on own**

Evening

- **6.15 pm – Gala Dinner IET Institution of Engineering & Technology**

Tuesday 17 June 2025

Morning: 9 am – 1 pm

- **9.00 am – Parallel Sessions (presentation sessions E-H & workshops 3-4)**
- **11.00 am – Break & refreshments**
- **11.30 am – Plenary Panel #2: Industry in Focus**

This session brings together leading industry voices to explore how sustainability is transforming engineering practice.

Brian Holliday, Managing Director, Siemens Digital Industries (UK & Ireland)

Maria Jobenius, Sustainability Expert at Scania & Industrial PhD Researcher, KTH

Sebastian Wood, Whitbybird Foundation

Lunch: 1 pm – 2 pm

Afternoon: 2 pm – 5.30 pm

- **2.00 pm – Parallel Sessions (presentation sessions I-L & workshops 5-6)**
- **4.00 pm – Break & refreshments**
- **4.30 pm – Keynote Address**

Prof Michele John, Curtin University

- **5.15 pm – Closing remarks**
- **5.30 pm – Time on own**

Evening

- **Dinner Carousel (at own expense)**

A chance to unwind, share ideas informally, and experience London in a relaxed setting

Wednesday 18 June 2025

Morning: 9 am – 1 pm

- **9.00 am – Parallel Sessions (presentation sessions M-N & workshops 7-9)**
- **11.00 am – Break & refreshments**
- **11.30 am – Parallel Sessions (presentation sessions O-P & workshops 10-12)**

Lunch: 1 pm – 2 pm

Afternoon: 2 pm – 5 pm

- **2.00 pm – Plenary Panel #3: Chairs of the Conference**
Reflecting back on the conference and highlighting trends, ideas and discussions
- **3.00 pm – Award announcements**
- **3.25 pm – EESD2027**
- **3.45 pm – Thanks you and good bye!**
- **4.00 pm – Break & refreshments**

Parallel sessions: *presentations and workshops*

Monday 16 June	Parallel track #1 Room K0.16	Parallel track #2 Room K0.18	Parallel track #3 Room K0.20	Parallel track #4: Edmond J Safra	Workshop: River Room	Workshop: Room K0.19	
11.00-13.00	Session A Key Competences for Sustainability Papers #76, #17, #27, #29	Session B Makerspace & Project-Based Learning Papers #54, #55, #80, #83	Session C Sustainability in Industry & Practice Papers #78, #16, #18, #45	Session D Pedagogical Strategies & Good Practice Papers #34, #35, #40, #63	Workshop #1 Paper #90 Marincel Payne & Williams	Workshop #2 Paper #36 Robertson	
Tuesday 17 June	Parallel track #1 Room K0.16	Parallel track #2 Room K0.18	Parallel track #3 Room K0.20	Parallel track #4: Edmond J Safra	Workshop: River Room	Workshop: Quad -1.26 (N)	Workshop: Quad -1.47 (S)
9:00-11:00	Session E Curriculum & Programme Development Papers #30, #10, #14, #19	Session F Curriculum & Programme Development Papers #13, #21, #70	Session G Project-Based Learning & Design Papers #66, #91, #92	Session H Technology for Sustainability Papers #3, #7, #8, #37	Workshop #3 Paper #53 Truslove, Hitt & Crichton	Workshop #4 Paper #11 Shah, Preston & Fuller	Workshop #10 DSL/FESTO Teimoori
14:00-16:00	Session I Engineers as Changemakers Papers #4, #56, #82, #46	Session J Problem-Based & Experiential Learning Papers #44, #69	Session K HE Capacity Building in students, staff & systems Papers #6, #31, #49	Session L AI for Sustainability Papers #62, #68, #5	Workshop #5 Paper #50/#79 Segalàs et al	Workshop #6 Paper #9 Anderson	Workshop #10 DSL/FESTO Teimoori
Wednesday 18 June	Parallel track #1 Room K0.16			Parallel track #4: Edmond J Safra	Workshop: River Room	Workshop: Quad -1.26 (N)	Workshop: Quad -1.47 (S)
9:00-11:00	Session M Ethics and Responsibility in Engineering Papers #12, #20, #88			Session N Transformative & Deep Learning Approaches Papers #52, #61, #26, #86	Workshop #7 Paper #33 Agg & Quazi	Workshop #8 Paper #77 Dahlin, Bonfield & Polmear	Workshop #9 Paper #71 Murphy & Goodman
11:30-13:00	Session O Sustainability in Industry & Practice Papers #32, #51, #59			Session P Curriculum & Programme Development Papers #57, #58, #67	Roundtable #1 Kirsten Williamson & Anna Garton	Workshop #11 Paper #25 Ficzkowski, Donald & Zytner	Workshop #12 Paper #84 Lawson-Bulten & Witmer

Workshops

1. Paper #90 Author(s): Michelle Marincel Payne and Julia Williams
Title: Enabling Perspective-Taking with Narrative Story to Teach Sustainability
2. Paper #36 Author(s): Elizabeth Robertson
Title: Ethical Change: Equipping the next generation of changemakers with the tools to engage in Sustainable Engineering
3. Paper #53 Author(s): Jonathan Truslove, Sarah Hitt and Emma Crichton
Title: How to navigate transformational change in engineering education
4. Paper #11 Author(s): Rehan Shah, Anne Preston and Stephanie Fuller
Title: Promoting equity in engineering education for sustainable development through community-based learning and teaching
5. Paper #50/79 Author(s): Jordi Segalàs, Gemma Tejedor, Boris Lazzarini, Carme Martín, Johanna Martínez, Barbara Sureda, David López, Torsten Masseck, Giulia Sonetti, Gemma Molins and Eva Vidal
Title: We're Hiring: Cook for a Transformative Learning Kitchen
6. Paper #9 Author(s): Cynthia Anderson
Title: Co-creating Sustainability Engineering Curricula for All
7. Paper #33 Author(s): Chloe Agg and Sophia Quazi
Title: Workshop to Support Embedding EDI in Teaching
8. Paper #77 Author(s): Jon-Erik Dahlin, Dawn Bonfield and Madeline Polmear
Title: Engaging Students with Sustainability: A Hands-On Workshop in Game-Based Learning
9. Paper #71 Author(s): Eva Murphy and Lizbeth Goodman
Title: Unmasking Bias, Embracing Inclusion: A Hands-on Inclusive Design Workshop for Engineering Educators to apply in their classrooms
10. DSL/FESTO Author(s): Omid Teimoori
Title: Sustainability in Industry 4.0 – Live Demonstration and Interactive Workshop
11. Paper #25 Author(s): Negin Ficzkowski, John Donald and Richard Zytner
Title: Co-Creating Regenerative Design Frameworks for Engineering Education and Practice
12. Paper #84 Author(s): Emily Lawson-Bulten and Ann-Perry Witmer
Title: Teaching Positionality for Sustainable Development: A Workshop on Identity's Influence on Design

Roundtables

1. Roundtable #1 Facilitator(s): Kirsten Williamson & Anna Garton
Title: Credentials as mechanism to embed sustainability into engineering education

Session A. Key Competences for Sustainability

- i. Paper #76 Author(s): Jon-Erik Dahlin, Cristina Al-Khalili Szigyarto, Ted Johansson, Roger Karlsson, and Madeline Polmear
Title: Fostering Values Thinking in Engineering Students through a Game-Based Sustainability Intervention
- ii. Paper #17 Author(s): Linlin Pei, Arnoud Onnink, Arturo Susarrey-Arce, Jéré van Lente, Albert Wong, André ten Elshof, H. Wormeester and L. Krab-Hüsken
Title: Integrating Essential Skills and Systems Thinking into Chemistry Education: The CLEAR Initiative for Sustainability
- iii. Paper #27 Author(s): Madeline Polmear
Title: Exploring Engineering Identity Development Through Narrative and Arts-based Approaches
- iv. Paper #29 Author(s): Rhythima Shinde, Ana Andrade, Aisha Salim, Kristen Macaskill, Laurence Chater and Pratistha Poudel
Title: Pre- and Post-Module Assessment of Improvement in Systems Thinking among Design Engineering Students: An Interactive Case Study-Based Approach

Session B. Makerspace & Project-Based Learning

- i. Paper #54 Author(s): Corrina Cory
Title: Engineering Maker Space and culture to enhance human creativity, exploration and collaboration for graduate success during industry 5.0
- ii. Paper #55 Author(s): Laura Fogg Rogers, Joe Butchers and Kat Corbett
Title: Creating MAKERS Spaces
- iii. Paper #80 Author(s): Jennifer Farmer and Ariel Chan
Title: Integrating Sustainability Principles into a Chemical Engineering Laboratory Curriculum
- iv. Paper #83 Author(s): Ana Rubio Denniss, Samuel Piper and Charlotte Palmer
Title: Making Sustainably: Embedding Sustainable Practices in Project-based Design Engineering

Session C. Sustainability in Industry & Practice

- i. Paper #78 Author(s): Anthony Heynen and Melanie Fleming
Title: Relational, place-based learning for the energy transition through the application of social frameworks
- ii. Paper #16 Author(s): Andrew Cowell, Ursula Canton, Christopher Smith and Alan Nesbitt
Title: Writing for Sustainability in Work-Based Projects
- iii. Paper #18 Author(s): Muhammad Talal Khalid, Listowell Appiah and Ann-Perry Witmer
Title: Contextual inquiry: Ten guideposts for investigating a community's context.
- iv. Paper #45 Author(s): Meeri Karvinen and Tiina Pajukari
Title: Reality check of sustainable engineering education: Exploring the leverage power of graduates in the early career

Session D. Pedagogical Strategies & Good Practice

- i. Paper #34 Author(s): Chloe Agg and Marc Masen
Title: Sustainable Teaching Practices for Teaching Sustainability
- ii. Paper #35 Author(s): Joseph Oyekale and James Atuonwu
Title: Embedding Sustainable Development in Engineering Education: Showcasing a Practice Within an Energy Engineering Module at NMITE
- iii. Paper #40 Author(s): Pritpal Singh
Title: Embedding Sustainability Concepts into a Renewable Energy Class
- iv. Paper #63 Author(s): Caitlin Bentley, Mira Vogel, Francesco Ciriello, Gabrielle Samuel, Jon-Erik Dahlin, Maira Klyshbekova, Ningyou Hou, Saumya Srivavastava, Amir Rahim and Sebastian Lehuede
Title: Co-designing Encounters with AI in Education for Sustainable Development

Session E. Curriculum & Programme Development

- i. Paper #30 Author(s): Tatiana Vakhitova, Nicolas Martin and Piers Ireland
Title: Teaching social sustainability to engineering students with the help of Social Impact Audit Tool
- ii. Paper #10 Author(s): Cynthia Anderson
Title: How Open Source Engineering for One Planet (EOP) Teaching Resources are Helping Faculty Infuse Sustainability in Diverse Courses and Programs
- iii. Paper #14 Author(s): Christianos Burlotos and Kristen MacAskill
Title: Strategies for embedding engineering for sustainable development in undergraduate teaching
- iv. Paper #19 Author(s): Manoj Ravi
Title: Asking the engineering educators: prevalence of SDGs in the engineering curriculum & analysing accreditation requirements

Session F. Curriculum & Programme Development

- i. Paper #13 Author(s): Pranav Chintalapati and Naoko Ellis
Title: Fostering Inclusive Leadership through Systems Thinking and Mentorship: A Collaborative Approach in Chemical Engineering Education
- ii. Paper #21 Author(s): Pinar Omur-Ozbek, Tom Siller and Gerry Johnson
Title: What's Wrong with "Engineering Education for Sustainable Development?" -It must be required
- iii. Paper #70 Author(s): Sarah M.C. Peers
Title: Mathematics in Engineering Education as a catalyst for Diversity, Sustainability, and Global Impact

Session G. Project-Based Learning & Design

- i. Paper #66 Author(s): Mari-Selina Kantanen and Katri Hendriksson
Title: Project-based studies strengthening expertise in circular economy and responsibility– case Mechanical Engineering
- ii. Paper #91 Author(s): Gowtham N, Vidya N L, Savyasachi G K, Utpal Deka, H V Balachandra Achar and S N Prasad
Title: Transforming Engineering Pedagogy: PBL for Creativity and Sustainable Quality Education
- iii. Paper #92 Author(s): Vidya N L, Gowtham N, Shobha Shankar, Savyasachi G K, Bhuvana S and Rakesh P M
Title: Fostering STEM Careers for Women: A Project-Based Learning Initiative in Engineering Education

Session H. Technology for Sustainability

- i. Paper #3 Author(s): Christian Farrelly and Shannon Chance
Title: Leveraging BIM Technologies to Achieve Net-Zero Carbon Design and Maximise LEED Efficacy
- ii. Paper #7 Author(s): Kauser Jahan, Ying Tang and George Lecakes
Title: WaterWorks: An Innovative Attempt at Promoting Careers in Environmental Engineering
- iii. Paper #8 Author(s): Gina Javanbakht and John Allport
Title: Redesigning Petroleum Engineering for a Sustainable Future: Integrating Clean Energy and Biofuels into University Curriculum
- iv. Paper #37 Author(s): Laura Mueller, Niclas Meihofener, Gabriel Siemoneit and Iryna Mozgova
Title: Introduction of Electronic Lab Notebooks in Engineering Education – Opportunities for a Cultural Change

Session I. Engineers as Changemakers

- i. Paper #4 Author(s): Taru Konst and Johanna Krappe
Title: Handprint of ESD – Case Universities of Applied Sciences in Finland
- ii. Paper #56 Author(s): Jose Martinez and Lizbeth Goodman
Title: Invention before Theory: How the Practical Often Leads Theory
- iii. Paper #82 Author(s): Emily Lawson-Bulten, Jess Mingee, Connor LaSalle and Ann-Perry Witmer
Title: Decolonizing Relationships: Moving from an Empowerment to Agency Mindset in International Engineering Interventions
- iv. Paper #46 Author(s): Vivek Ramachandran, Kate Roach and Emanuela Tilley
Title: Weaving Responsibility into Engineering Education

Session J. Problem-Based & Experiential Learning

- i. Paper #44 Author(s): Andrea Grech La Rosa, Peter Simpson and Thomas Peach
Title: Piloting Circular Economy Initiatives in an Educational Maker Space
- ii. Paper #69 Author(s): Graham Ward, Andreas Georgakarakos, Sarah Peers and Bertie Knight
Title: Sustainable and Equitable Energy Systems: Engineers as Changemakers and Innovative Pedagogy in Engineering Education

Session K. Capacity Building within Higher Education

- i. Paper #6 Author(s): Jennifer Mueller, Mark Minster and Rebecca DeVasher
Title: Building a Community of Practice to Facilitate Integration of Sustainability into Higher Education Curriculum
- ii. Paper #31 Author(s): Nicole Kirk, Jessie Wong, Rehan Shah and Anne Preston
Title: Student Researchers Breaking Barriers: Exploring How STEM Can Drive Education for Sustainability in UK Higher Education
- iii. Paper #49 Author(s): Marianna Malkamäki and Meeri Karvinen
Title: Organisational support in Driving Sustainability Integration in Engineering Education

Session L. AI for Sustainability

- i. Paper #62 Author(s): Princewill Ikpeka and Mary Richards
Title: AI-Enhanced TPACK for Transdisciplinary Programs in Higher Education
- ii. Paper #68 Author(s): Edmond Byrne
Title: Asymmetrical Innovation; AI as educational disruptor or as ethical-ecological tinderbox?
- iii. Paper #5 Author(s): Swagata Sarkar, Harini K, Sri Pavatharani S and Varsha G S
Title: Automated Trash Boat Using AI

Session M. Ethics and Responsibility in Engineering

- i. Paper #12 Author(s): Cecilia Gustavsson, Ali Al-Adili, Robert Frost and Andreas Solders
Title: Introducing ethical sustainability dilemmas in nuclear engineering education
- ii. Paper #20 Author(s): Richard Fenner
Title: Dangers of the technical fix, techno-optimism, technological inevitability and the stories we tell
- iii. Paper #88 Author(s): Riadh Habash
Title: Course-Based Undergraduate Research through the Lens of Ethics and Sustainability for Equity- and Quality-Driven Education

Session N. Transformative & Deep Learning Approaches

- i. Paper #52 Author(s): Dai Morgan, Jennifer Ahern, Edmond Byrne, Naoko Ellis and Derek Gladwin
Title: Fostering Hope in Engineering for Sustainable Development
- ii. Paper #61 Author(s): Daniel Pargman, Elina Eriksson, Arjun Rajendran Menon, Minna Laurell Thorslund and Aksel Bjørn-Hansen
Title: Navigating Complexity and Embracing Uncertainty: Teaching Participatory Leadership in Engineering Education
- iii. Paper #26 Author(s): Gearold Johnson and Thomas Siller
Title: Degrowth by design rather than disaster
- iv. Paper #86 Author(s): Claudia Moorhouse
Title: The impact of misaligned ideals within engineering faculties on student disillusionment

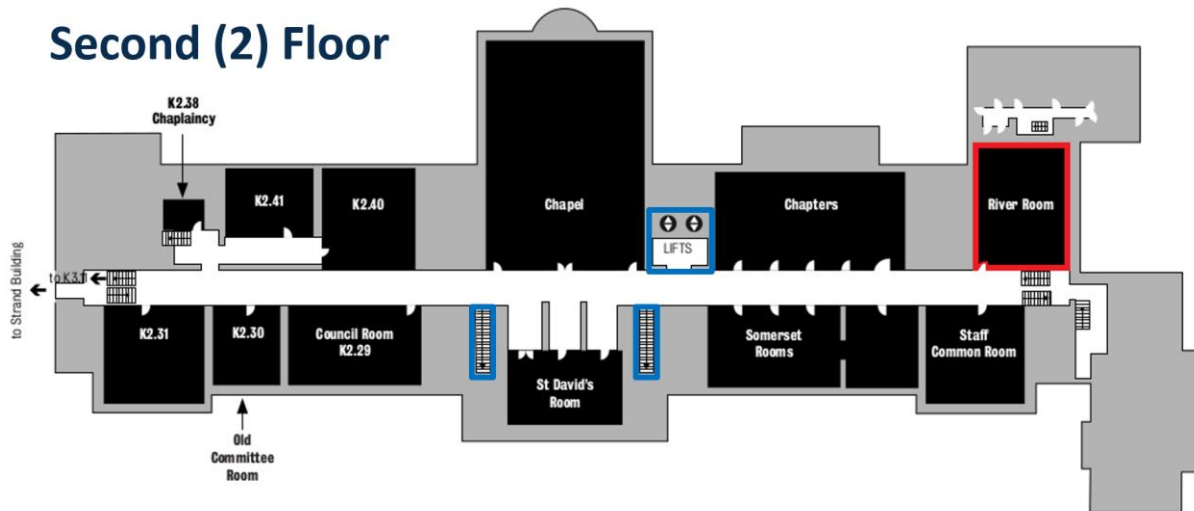
Session O. Sustainability in Industry & Practice

- i. Paper #32 Author(s): Maria Jobenius, Anne-Katrin Peters and Lena Gumaelius
Title: Sustainability change agents in business transformation - empowerment through training
- ii. Paper #51 Author(s): Stephen Hunt, Diana Martin, John Mitchell and David Guile
Title: Graduate insights on the development and use of sustainability skills
- iii. Paper #59 Author(s): Robert Hesketh, Barnabas Gao, Thien An Pham, Emma Padros, Andrew Malec, Amarelys Rios, J. Patterson, C. S. Slater and K. M. Yenkie
Title: Academic and Industrial Collaboration for Sustainability and Process Efficiency

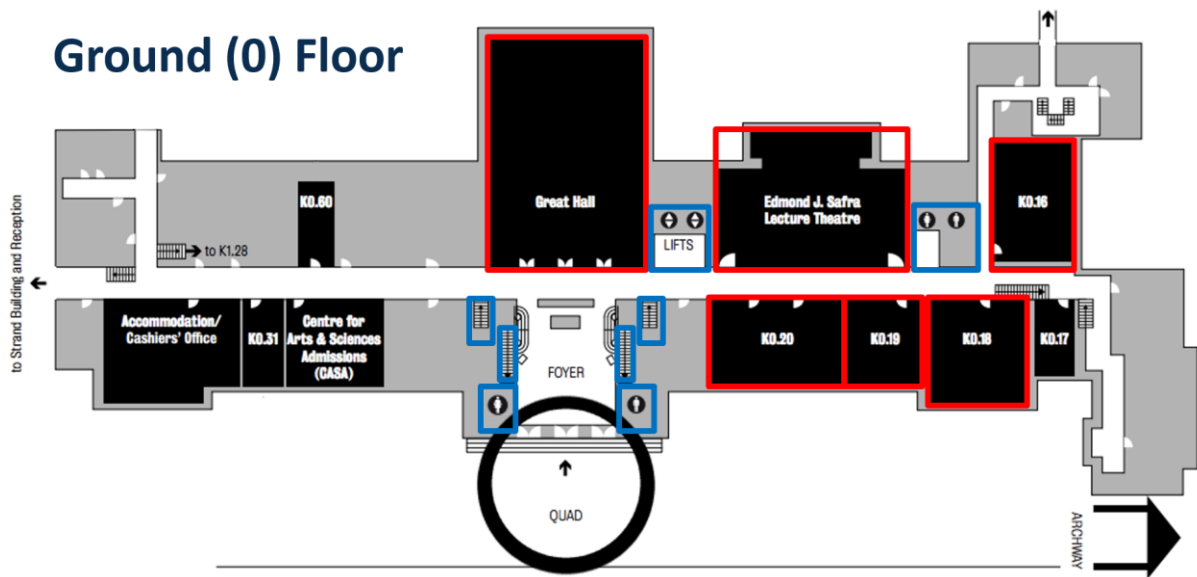
Session P. Curriculum & Programme Development

- i. Paper #57 Author(s): Dr Maryam Masood, Lauren Schrock and Asima Iqbal
Title: Embedding sustainability in engineering education through a multi-disciplinary postgraduate research methods module
- ii. Paper #58 Author(s): Jan Andersson and Karin Stensjö
Title: Integrating Sustainability Competencies into Molecular Biotechnology Engineering Education: A Strategic Approach
- iii. Paper #67 Author(s): Bruna Sá Couto, Jordi Segalàs and Joana Maia Dias
Title: Sustainability Learning Outcomes in Engineering: A Review of Concepts and Course differences

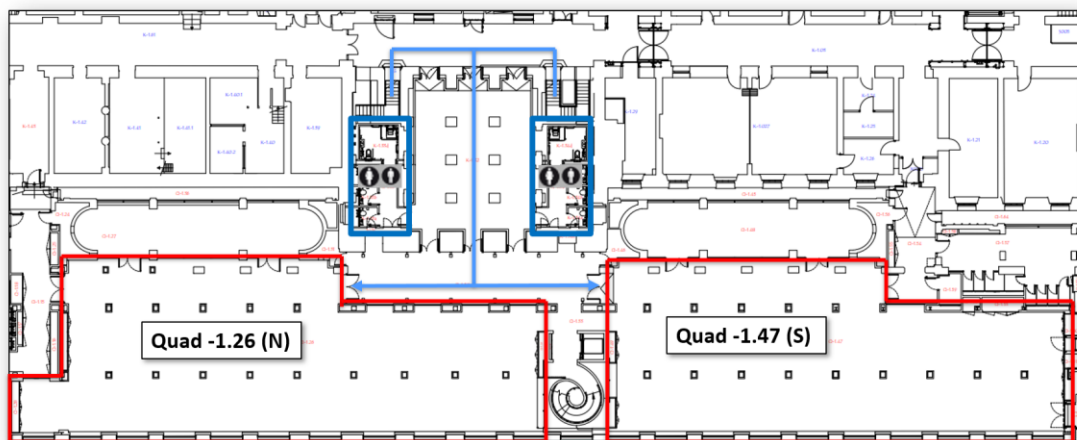
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