



Invited Keynote Lecturer at CNGF2025 in Timișoara Romanian National Conference on Soil Mechanics and Foundations

Univ.-Prof. Dr.-Ing. habil. Christian Moormann

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Curriculum

Christian Moormann is full professor and head of department of the Institute of Geotechnical Engineering at the University of Stuttgart (IGS). He earned his Diploma in civil engineering from the University of Hannover (Germany) and received his Ph.D. and Habilitation from the Technical University of Darmstadt (Germany). Prof Moormann has been involved in geotechnical research, consulting and education for over 25 years providing solutions to a wide range of geotechnical research projects and tasks, including physical and numerical modelling, resilience, renewable energy, underground structures and deep foundations. He has published more than 450 scientific papers covering a wide range of soil and rock mechanics, geotechnical design, tunneling, geothermics etc. aspects. As authorised and certified court expert advisor and owner of Moormann Geotechnical Consult (MGC) he has been responsible for the design, peer-review and checking of 1,000+ projects in civil, geotechnical and environmental engineering in more than 40 countries worldwide. Prof. Moormann is also certified independent checking engineer for all kind of geotechnical structures. He is a management group member of SC7 drafting the next generation of Eurocode 7 and led the project team for the new Part 3 'Geotechnical Structures'. Since 2022 Prof. Moormann is serving as president of the German Geotechnical Society (DGGT).



Abstract of invited Keynote Lecture

Title:

**Forensic geotechnical investigations on the Cologne Metro Station box collapse –
Lessons learned for quality assurance and risk analysis in geotechnical engineering**

Abstract:

In the field of geotechnical engineering, risks that materialise can have a significant impact on the serviceability and stability of a geotechnical structure, as well as its construction timeline. Additionally, these risks can potentially affect the surrounding environment. Those risks arise not alone from variable and complex characteristics of the subsoil and groundwater, as well as from design and modelling of the soil-structure interaction, but also from execution process. Hence, risk management must identify various sources of risk and conduct risk analyses to assess the probability and consequences of undesirable events. Risk control and mitigation measures should cover all stages of ground investigation, geotechnical interpretation, design and construction. These aspects will be explored and reflected on the collapse of the Historical Archive of the city of Cologne as an example. On March 3rd, 2009, the collapse of the archive and adjacent buildings occurred during the construction of the new North-South metro line. This incident caused significant damage to the city of Cologne, but also affected the underground construction sector in general. With a total damage sum of around 1.3 billion euros, it stands as the most severe accident on a German construction site to date. The investigation of the damage evidence was a technically challenging task that lasted more than twelve years. It involved numerous steps, including the construction of a 34 m deep investigation shaft. Based on these experiences the consequences for the independent checking of design and execution, for the quality assurance of underground works and their supervision, but also the need for a risk prevention based on communication and partnership between all parties involved in the construction process will be reflected.