



ΕΛΛΗΝΙΚΗ  
ΕΠΙΣΤΗΜΟΝΙΚΗ  
ΕΤΑΙΡΕΙΑ  
ΕΔΑΦΟΜΗΧΑΝΙΚΗΣ  
& ΓΕΩΤΕΧΝΙΚΗΣ  
ΜΗΧΑΝΙΚΗΣ

Αθήνα, 11 Ιανουαρίου 2019

## ΠΡΟΣΚΛΗΣΗ

Η Ελληνική Επιστημονική Εταιρεία Εδαφομηχανικής και Γεωτεχνικής Μηχανικής (ΕΕΕΕΓΜ) έχει την τιμή να σας προσκαλέσει στην

### **12<sup>η</sup> Αθηναϊκή Διάλεξη Γεωτεχνικής Μηχανικής**

η οποία θα δοθεί από την **Lidija Zdravkovic**,  
Καθηγήτρια του Imperial College του Λονδίνου με θέμα

### **Assessing the geotechnical risk associated with natural and cut slopes**

Η διάλεξη θα δοθεί στην Αίθουσα Τελετών του Κτιρίου Διοίκησης του  
Εθνικού Μετσοβίου Πολυτεχνείου στην Πολυτεχνειούπολη Ζωγράφου  
την Τετάρτη **23 Ιανουαρίου 2019, ώρα 17:30**  
(προσέλευση από 17:00)

Ο Πρόεδρος  
Καθηγητής Γ. ΓΚΑΖΕΤΑΣ

Ο Γραμματέας  
Δρ Μ. ΜΠΑΡΔΑΝΗΣ

The 12<sup>th</sup> Athenian Lecture  
of the Hellenic Society of Soil Mechanics and Geotechnical Engineering (HSSMGE)  
**23<sup>rd</sup> January 2019**

## Assessing the geotechnical risk associated with natural and cut slopes

Professor Lidija Zdravkovic, Imperial College London, UK

### ABSTRACT

Natural and infrastructure slopes are invariably exposed to seasonal variations of atmospheric conditions. Statistics from around the world are showing that the effects of climate change in the recent decade have increased the frequency and intensity of extreme atmospheric events, with material devastation and loss of life being frequent consequences. With current design requirements for a life-cycle assessment of civil engineering construction, the need for robust and reliable assessment tools has become pertinent. Evidently, computational analysis of some form is the main candidate to enable predictions of the long-term behaviour of civil infrastructure and to quantify the geotechnical risk associated with extreme atmospheric conditions.

The lecture starts with a brief overview of advanced computational tools, in conjunction with the finite element method, necessary for realistic modelling of soil-atmosphere interaction. A study is then presented of the whole life-cycle of an infrastructure slope, capturing the recorded seasonal rainfall, as well as the vegetation growth before and after slope excavation. Advanced algorithms for assessing safety factors at various stages of the slope's life are employed to demonstrate and quantify the geotechnical hazard associated with extreme changes in seasonal patterns and how such knowledge can be used to inform the safe design and maintenance of infrastructure slopes. In continuation, triggering mechanisms for catastrophic mudslides are discussed based on a case study of a natural slope, using the same computational tools. This study highlights and quantifies the prerequisite geotechnical conditions that can lead to slope failure as a result of changes in atmospheric conditions on the slope.

### SPEAKER

Lidija Zdravkovic is Professor of Computational Geomechanics and Head of the Geotechnics Division at Imperial College London, UK. She holds an MEng degree in Civil Engineering and an MSc in Geotechnical Engineering from the University of Belgrade in Serbia, and obtained a PhD degree in Geotechnical Engineering from Imperial College in 1996. Lidija has led and managed several research projects in collaboration with industry and other academic groups, focusing on the development and application of numerical methods in geotechnical design and providing solutions to a wide range of geotechnical problems, including renewable energy, nuclear waste disposal and infrastructure resilience. Lidija has authored and co-authored over 150 technical publications and received prizes from the Institution of Civil Engineers and the British Geotechnical Association, UK. She is also active in the profession, advising on recent projects involving Heathrow Terminal 5 development, Crossrail excavations, and embankments and cut slopes on the High Speed Rail route in the UK. From 2010 to 2013 she served as an elected member on the British Geotechnical Association's Executive Committee.

