

11
2017

NOON TALK @ DIATI

Mercoledì 1 FEBBRAIO 2017
ore 13.00

Politecnico di Torino
Sala Riunioni 1° Piano DIATI
ingresso 3

Daniel Dias

Professor of Geotechnical Engineering at the
Grenoble Alpes University (France)

**“Upper Bound Limit Analysis on
Tunnel Face Stability”**



**POLITECNICO
DI TORINO**

Dipartimento di Ingegneria
dell'Ambiente, del Territorio
e delle Infrastrutture



ABSTRACT

The existing theoretical methods for the evaluation of tunnel face stability mainly include the limit equilibrium and the upper-bound limit analysis methods. In recent years, more emphasis has been focused on the calculation of the required face pressure when the excavation is done using a tunneling boring machine. Another alternative technique, the New Austrian Tunneling Method (NATM), has also been extensively used for tunneling recently. In the NATM, no supporting pressure is applied to the tunnel face due to the open-face excavation, therefore the more important and appropriate factor for the design in the open-face tunneling is the estimation of the safety factor.

In this lecture, a new 3D rotational mechanism based on the kinematical approach of the limit analysis applied to the tunnel face stability will be presented. A first application will be the design of the critical face pressure to be applied at the tunnel face. Then this method was adapted (use of the strength reduction method) to calculate the factor of safety of a non-circular tunnel face. Other developments considering the tunnel face reinforcement, the groundwater table will also be presented in a deterministic context. A probabilistic analysis using random fields will end this oral presentation.

BIOGRAFIA

Daniel Dias obtained his MSc in Civil Engineering from INSA (National Institute of Applied Sciences) of Lyon (France). He finished his PhD in 2000 on Numerical modelling of tunnel face reinforcement at INSA of Lyon. From 2000 to 2011 he was an associate professor at INSA of Lyon. For more than 10 years he has worked on Geomechanics (numerical and experimental modelling of tunnels and soil reinforcement). Since 2011, he is a professor of Geotechnical engineering at the Grenoble Alpes University (France). In the last 5 years his main areas of interest are:

- the design of underground excavations and pile embankments,
- the hydromechanic behaviour of municipal solid waste,
- the impact of soil variability on the reliability of geotechnical structures.

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Please bring
your own mug.
Coffee and tea
will be
provided
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Save the date for our next speaker-event, on March 1 2017, at 13:00.