



# The Institution of Engineers, Malaysia

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## Talk on Numerical Modeling and Computation Methods of Concrete Face Rockfill Dam

(Organised by the Geotechnical Engineering Technical Division, IEM)

BEM Approved CPD/PDP Hours: 2.0 Ref No: IEM15/HQ/420/T

Date/Day: Thursday, 26 November 2015

Time: 5.30 pm – 7.30 pm

Venue: Tan Sri Ir. Prof. Chin Fung Kee Auditorium, 3rd Floor, Wisma IEM, PJ

Speaker: Prof. Dr Xu Zeping

### SYNOPSIS

In CFRD (Concrete Faced Rockfill Dam) engineering, prediction of performance of the dam is very important for structure design and determination of construction schemes. In recent years, more and more high CFRD projects will be constructed and the topographic and geologic conditions of dam site are also more and more complicated, which have brought great challenges for the theoretic modelling and analytic method of the numerical analysis of CFRD. The talk focuses on the numerical modelling and computation methods for stress and deformation analysis of CFRD. With the discussion on engineering properties of rockfill material, the constitutive models for simulating stress-strain relationship of rockfill materials will be introduced, which include nonlinear elastic models, elasto-plastic models and the models for creep deformation. Numerical analysis on the stress and deformation properties of CFRD is conducted by finite element method. For CFRD, the computation method should consider the non-linear stress strain features of rockfill materials. In addition, the interface of concrete face slabs and rockfill should also be well simulated, as the non-linear contact properties of concrete and rockfill will have significant impacts on the stresses of concrete slabs. For high CFRD, the creep deformation of rockfill will be an important factor to be considered. Based on the mathematic models for creep deformation of rockfill, the correspondent computation method is developed to take into account the influences of the impacts of rockfill creep deformation. With the introduction of the theoretic models and computation methods for the numerical analysis of CFRD, several typical cases will be presented to illustrate the stress and deformation features of CFRD in different conditions. Furthermore, the latest technologies and developing trends for numerical analysis of CFRD will be discussed.

### BIODATA OF SPEAKER



**Prof. Dr Zeping Xu**, is a professor and senior engineer of China Institute of Water Resources and Hydropower Research. He graduated in Engineering Mechanics from Hohai University, China, in 1984, and then completed post-graduate course in Geotechnical Engineering and got PhD degree in China Institute of Water Resources and Hydropower Research (IWHR). He has more than 20 years of experience in the field of dam engineering, especially in rockfill dam engineering, working as researcher, dam engineer and engineering consultant.

He is the chairman for the Technical Committee on Embankment and dams (TC210) of International Society for Soil Mechanics & Geotechnical Engineering (ISSMGE), deputy secretary general of Chinese National Committee on Large Dams (CHINCOLD) and vice director of the technical committee of CFRD in China. He is also ICOLD technical committee member on dam safety and capacity building. Dr Xu mainly focuses on the studies of rockfill dam engineering, numerical analysis of geotechnical engineering, geotechnical testing, centrifuge modelling and assessment of dam safety. He has been keynote speaker of several international conferences and symposiums. He is the general reporter of Question 98 of the 25<sup>th</sup> ICOLD conference (Stavanger, Norway, 2015).

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Ir. Yee Thien Seng

Chairman, Geotechnical Engineering Technical Division, IEM

### ANNOUNCEMENTS TO NOTE

1. Preferential admission to talk shall be accorded to IEM members (pre-registration and online registration are NOT required). Telephone and/or fax reservation will NOT be entertained.
2. **Non members** may also attend the talk but will need to pay a registration fee of **RM 50** and an administrative fee of **RM 15**. GST is inclusive.
3. For members of affiliated organisations, there will be no registration fee payable. However, they are requested to produce their membership card as proof of membership. For the list of affiliated organisations, please refer to IEM website at [www.myiem.org.my](http://www.myiem.org.my) under International / MoU.
4. Limited seats are available on a "first come first served" basis (maximum 100 participants).
5. IEM members are required to produce membership cards for confirmation of attendance (CPD purpose).
6. Latecomers will not be allowed to enter if the lecture hall is full nor be entitled to CPD.
7. **IEM members who fail to produce their membership cards will be charged a fee of RM 25. GST is inclusive.**

### ADMINISTRATIVE FEE

1. Kindly be informed that an administrative fee of RM 15 is payable for talks organized by IEM.
2. The fee would be used to cover overhead costs, building maintenance expenses as well as to contribute to Wisma IEM Building Fund.
3. All contributions will be deeply appreciated by IEM.
4. Student Members are however exempted.

### CPD/PDP HOURS CONFIRMATION

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Signature: .....