



Reinforced Soil Retaining Walls: An Outline of Design Methods and Sources of Conservatism Workshop on “Soil Parameters - Interpretation for Design”

by Mr. Richard Ong Tian Hwa, Grad. IEM

Richard Ong Tian Hwa Grad. IEM is currently a co-opted member in the GeoTechnical Engineering Technical Division Session 2015/2016.

IEM’s Geotechnical Engineering Technical Division (GETD) organised an evening talk entitled “Reinforced Soil Retaining Walls - An Outline of Design Methods and Sources of Conservatism” on 21 August 2013 at the Tan Sri Prof. Chin Fung Kee Auditorium, Wisma IEM.

The talk was delivered by Mr. Mike Dobie and attended by 70 participants.

Three elements are being considered on the design of reinforced soil retaining walls: method of calculation; material parameters; and design factors. Each element was examined in turn where the practice of conservatism might be possible.

The first element being considered was on method of calculating the internal stability of reinforced soil retaining walls. This element may result in considerable conservatism due to many assumptions made to carry out the calculation. By using more realistic methods of calculation (e.g., two-part wedge method), the optimum use of the reinforcement can be achieved while improving the design of reinforced soil retaining walls (e.g., able to identify the effects of any weak points such as low connection strength between reinforcement and facing).

The second element being considered was the material properties, which include the fill soils, the reinforcement and the interaction between the two. Fill soil properties (i.e., shear strength and unit weight) are the most important material properties for the design of reinforced soil retaining walls since more than 99% of the walls consist of soils. Therefore it is most important that the correct soil test procedures are used, especially for finer soils where quick undrained tests are not suitable. With regard to the strength of the reinforcement, it must be determined as suitable for the full design life of the retaining wall, taking into account that degradation continues throughout its service life.

The third element being considered was the design factors. These design factors are defined partly to take into account uncertainties, partly to ensure a safe structure and partly to ensure adequate serviceability during the life of the structure. In engineering practice, these factors are well defined in the code of practice or standard (e.g., BS8006).

At the end of the presentation, Mr. Mike took on a few questions from the floor. To a question related to the durability of plastic (i.e., geosynthetics) reinforcement, Mr. Mike said that a well designed reinforced soil retaining wall using geosynthetics could have design life of up to 120 years. The evening talk came to the end after the presentation of appreciation certificate and memento to Mike by Ir. Yee Thien Seng.