

Comparative Study of Pile Design Between Conventional Working Stress Method and EC7 Limit State Design Method

GEOTECHNICAL ENGINEERING TECHNICAL DIVISION



reported by
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Ir. Yee Thien Seng is the Chairman of Geotechnical Engineering Technical Division. He is the principal of Geo. Consult, a practice offering expert and specialist consultancy to the construction industry and in particular, on geotechnical engineering aspects. He has authored and co-authored more than a dozen technical papers in local and international conferences. Ir. Yee is an expert witness and accredited checker for design of geotechnical engineering works registered with the Board of Engineer Malaysia.

An evening talk on "Comparative Study Of Pile Design Between Conventional Working Stress Method And EC7 Limit State Design Method", held on 23 June 2015 at the Tan Sri Professor Chin Fung Kee Auditorium, had an attendance of 42 IEM members.

Giving the talk was Ir. Balakrishnan ETTY Gaunder who briefly described the philosophy behind the new design approach that was required under MS EN 1997.

It is similar to the ultimate limit state design method that has been used for a long time by reinforced concrete design engineers. In the limit state design approach, the designer factors in the loads to be applied on the supporting element after its characteristic material strength or resistance, is factored in.

CONVENTIONAL DESIGN PRACTICE

The conventional design practice of determining the working load of a pile by either summing up its estimated component shaft and base resistances after dividing by the respective Factors Of Safety or alternately dividing its gross estimated resistance by a common Factor Of Safety to arrive the required design length was revisited by Ir. Balakrishnan.

MS EN 1997 WITH THE MALAYSIA NATIONAL ANNEX (MY-NA)

He then discussed the computation procedures to obtain design pile lengths using MS EN 1997 with the Malaysia National Annex (MY-NA) where the key activity was the determination of the pile's characteristic resistances from the ground at various pile penetration lengths. A pile's design resistance is obtained by factoring in its characteristic resistance with the partial resistance factor appropriate to the pile type considered. The

principle applies to both the Model Pile and Alternative methods of design.

Finally, Ir. Balakrishnan presented a comparative study of required pile lengths as well as the Factors Of Safety that would arise from the use of both the traditional practice and MS EN 1997 methods at a building project site in Kenny Hill formation.

The study encompassed bored piles and prestressed spun concrete pipe piles. His study showed that the design using MS EN 1997, with MY-NA adopting both the Model Pile and Alternative methods employing ground parameters from pile load tests results for the site, was comparable to that from the conventional design practice. Otherwise, MS EN 1997 produced slightly more conservative design pile lengths. ■

IEM DIARY OF EVENTS

Title: 2-Day Course on Welding Knowledge & Its Application In Engineering & Construction

16 - 17 December 2015

Organised by : The Young Engineers Section –
Graduates & Student
Time : 9.00 a.m. – 5.30 p.m.
CPD/PDP : 14

Title: 1-Day Course on Leadership for Engineers 3 - Leadership for Entrepreneurs

17 December 2015

Organised by : Public Sector Engineers
Special Interest Group
Time : 9.00 a.m. – 5.00 p.m.
CPD/PDP : 6.5

Kindly note that the scheduled events below are subject to change. Please visit the IEM website at www.myiem.org.my for more information on the upcoming events.