

Discussion: Rock socket piles at Mall of the Emirates, Dubai

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The author does not make clear whether he has used the design line in Fig. 6 or a mean value of the measured unconfined compression strengths (UCS) as plotted in this diagram, for the purpose of predicting the ultimate socket friction in the Upper Sandstone and Conglomerate formations. Fig. 6 indicates that the mean UCS/depth relationship is appreciably higher than the conservative design line.

This affects the author's findings on the predicted/observed ratios for the various design methods listed in Table 10.

Author's response

The UCS design line shown in Fig. 6 was used for the purpose of predicting the ultimate skin friction along the rock socket. It was selected following consultations with ground investigation contractors in Dubai. The adopted design line is not considered to be conservative because, when it was used in the

preliminary pile design (which was based on the relationship between pile capacity and the UCS¹¹), the ultimate pile capacity was overestimated, as shown in Fig.12.

The UCS design line in Fig. 6 was adopted in the preliminary pile design with a view to controlling the geotechnical risk arising from the widely differing prediction results of pile design methods. Had the mean UCS profile been used in the preliminary design it would have resulted in a further overestimation of the ultimate pile capacity compared with that measured in the preliminary pile testing (refer to Fig. 12).

It is worth noting that, if the mean value of the UCS is used for the purpose of comparing the predicted/observed ratios for the various design methods listed in Table 10, the conclusion stated in section 7.11.7 on the most suitable design method for rock socket piles in the carbonate sandstone in Dubai remains unaffected.