Geocell mattress: Encased fly ash column composite systems in soft clay

This study narrates the use of post-consumer waste plastic water bottles for developing a new type encasement to confine the fly ash columns fully penetrated in soft clay. Geocell reinforced fly ash beds along with a jute geotextile separator were also placed over the fly ash columns, while the cellular mattresses were also made of same type plastic water bottles.



A series of systematic model tests were carried out on encased fly ash columns, geocell composite systems and encased fly ash column-geocell



composite systems in soft clay, while the three different systems produced improved footing capacity around fivefold, 8.5 times and twelvefold, respectively as compared to the untreated clay bed. It was observed that with increase in mattress height over the encased fly ash column, the contribution from the encased column decreased accompanying higher contribution from the geocell mattress in the overall footing capacity over encased fly ash columngeocell composite systems. Besides,

models tests were also performed on groups of three and four end bearing encased fly ash columns in triangular and square patterns, respectively to find out efficacy of the proposed plastic bottle encasement in group column situation. The group of four columns showed better footing capacity than that over single column and group of three columns.

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