Assessment of Drainage Properties of PBDs(Prefabricated Board Drains) for Soft Soil Reinforcement

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Abstract

Theoretical studies have been performed for drainage and filtration characteristics, low consolidation rate of sandmat and prefabricated horizontal and vertical drains. Discussion on quality control and methodology, cost analysis for sandmat and prefabricated horizontal drains were performed.

Introduction

Sand drain, pack drain, sand compaction pile and plastic vertical drain have been used to improve soft ground. In this study, a theoretical analysis on the drainage characteristics and low consolidation rate of sand mat and prefabricated horizontal drains(PHDs) were performed. Instrumentation is conducted to investigate the drainage capacity and applicability of PHDs and finally, guidlines for the design and construction of PHDs are proposed.

Experimental

PHDs are comprised of PVC core and polyester filter. Its dimension is 5～25mm of thickness and 30～100cm of width.
Ground water is flowed in the inner part drainage material through filter around PHDs, and pass drain portion of main frame.
Various types of PHDs were used at two highway construction sites to investigate drainage capacity and filed applicability. Monitoring with piezometers, settlement gauges and inclinometers were performed.

Results

Figure 1 shows the results that degree of consolidation with PHDs is larger than sandmat pore water pressure.
Horizontal drainage material has various practical use such as drainage hole for bank stability, mountain district extension part's drainage hole, construction drainage hole as well as soft ground width drainage hole is possible.
It has construction examples for methods of constructions widely used in international scale and it will be presented next.

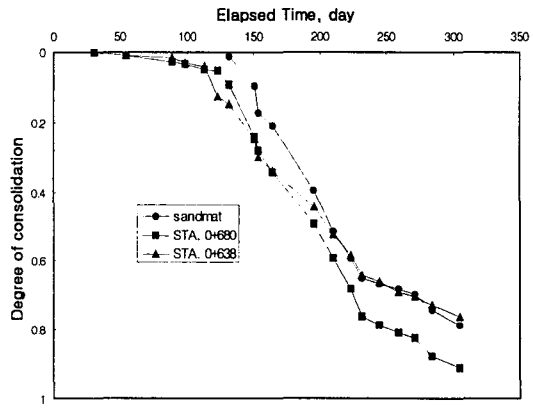

Figure 1. Degree of consolidation degree of PHDs and sandmat

Conclusions

PHDs have enough drainage capacity in comparison with sand, even though surcharge is present. PHDs material can be used for a substitute of sand mat principal parts in soft ground processing method.
PHDs material has various practical use such as drainage hole for bank stability, mountain district extension department's drainage hole, construction drainage hole as well as soft ground width drainage hole.

References

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