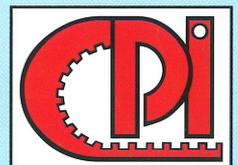




Flexi-Drain[®]

• Prefabricated Vertical Drains

Your Reliable Choice for Soil Improvement Work



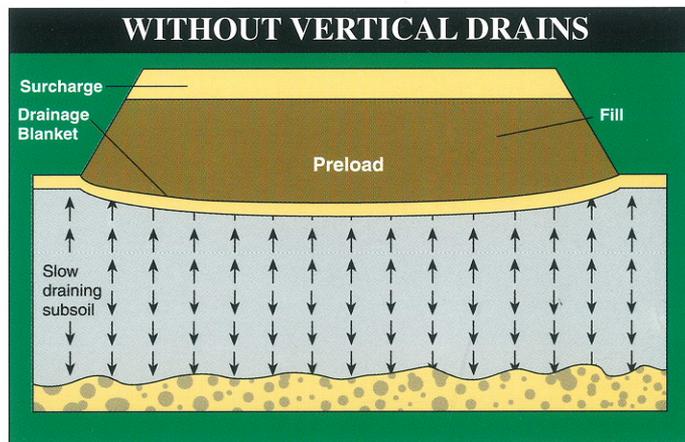
PRELIMINARY

PRINCIPLES AND FUNCTIONS

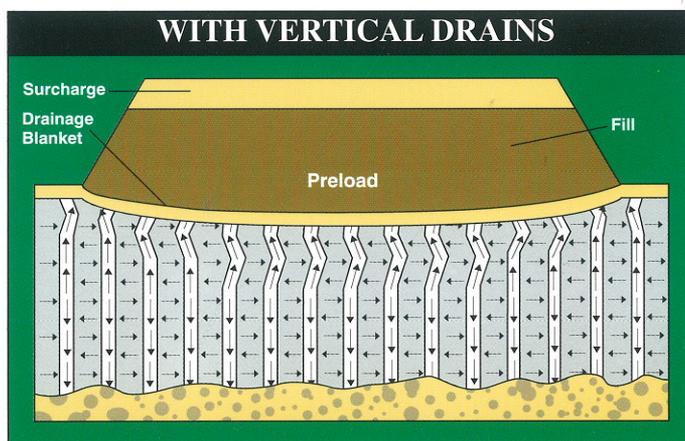
Often, engineers are required to build on sites which consist of fine grained, saturated soil that have poor drainage properties. It is critical that all excess water be removed from the soil before construction of new buildings, infrastructures and other amenities structure. Presently, there are various methods available to improve the soft compressible soils. Soil improvement with Prefabricated Vertical Drain is among the most economical method.

THE CONSOLIDATION PROCESS

The application of load on top of the soil will result in an initial increase in pore water pressure which will dissipate slowly as the pore water drains off. In saturated soils which have a large percentage of voids or pores usually filled with water, the settlement process will be lengthy. This process will further extend if the soil is finer as it will be more difficult and time consuming for water to drain. Besides the permeability of the soil, the drainage time also depends on factors such as the thickness of the soil layers and the distance the water has to flow through the soil to escape. During this process known as consolidation, the load is gradually transferred to the soil particles as the volumes of the voids are reduced and this culminates in the form of settlement.



Without inserting PVD, dissipation of excess pore pressure is a slow process.



With PVD the excess pore pressure dissipates quickly through shorter drainage paths.

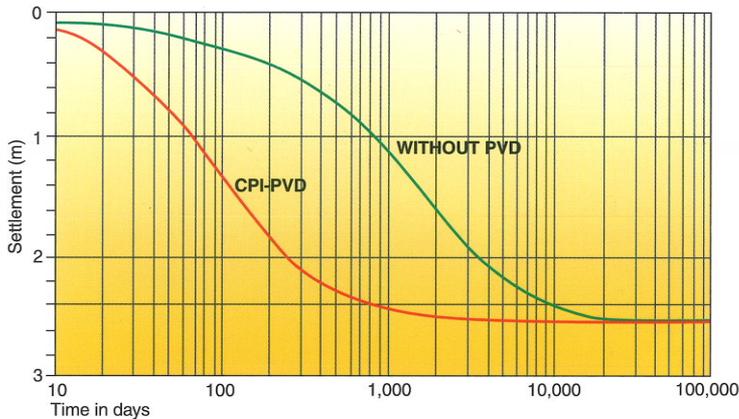
PERFORMANCE OF VERTICAL DRAINS

The low permeability of the soil thus results to a lengthy consolidation process. In order to accelerate the consolidation process, vertical drains are installed in regular spacing into the full depth of the compressible soil layer. This creates an artificial and shorter horizontal drainage paths. Vertical drains enable the pressurised water to flow horizontally towards the nearest drains, and escape freely through the longitudinal grooves on both sides of the vertical drain core. Usually it is used in conjunction with pre-loading the surcharge with soil or vacuum pressure.

Though the principle of vertical drains is simple, the process is complicated. Great care has to be taken when choosing vertical drains as they are subjected to both tensile and compressive forces when the soil shifts and settles during the consolidation process. This can severely affect the ability of the drains to function as intended.

- Lateral soil displacements can cause certain drains to elongate beyond their rupture point.
- Substantial vertical soil pressure can cause some drains to pinch off, as they experience folding and buckling of the core.

Therefore, it is of utmost importance that drain performance under both conditions be considered when selecting a vertical drain. Remember, drain failure can severely jeopardise the project's construction schedule and structure stability.



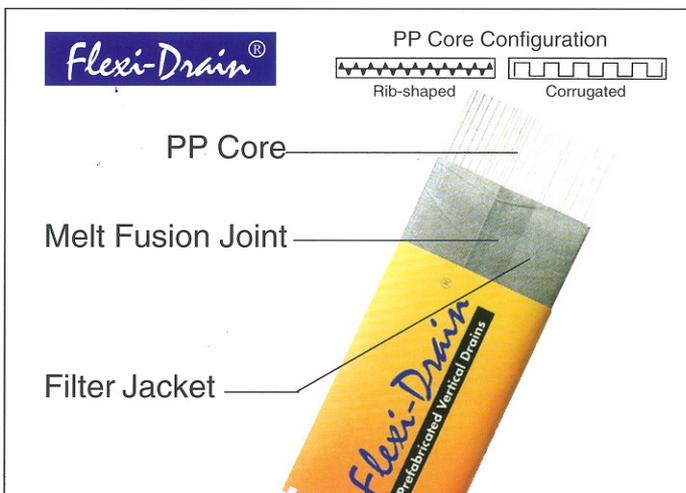
VERTICAL DRAINS ACCELERATE CONSOLIDATION

THE FLEXI-DRAIN SYSTEM

Flexi-Drain consists of :-

- Drain body - a unique, corrugated / rib-shaped Flexi-drain core made of polypropylene is specifically designed to provide high discharge capacity, high tensile and compressive strength.
- Filter jacket - a strong and durable non-woven polypropylene with high tensile strength, high permeability and effective filtering properties. It acts as a filter to allow passage of ground water into the drain core while eliminating movement of soil particles and preventing piping. It also serves as an outer skin to maintain the cross-sectional shape and hydraulic capacity of the core channels.

By combining both the features of the unique cores and filter jacket, Flexi-Drain system provides effective, fast and reliable performance for soil improvement. The range of Flexi-Drain is available with different core shapes and filter fabrics to suit various soil conditions and engineering practices.



ADVANTAGES OF THE FLEXI-DRAIN SYSTEM

- Minimum disturbance to the soil layers during installation.
- High water discharge capacity.
- Customised cores and filters to suit the various soil conditions.
- High compressive strength core prevents the collapse of the flow path.
- The unique and flexible core will not pinch off or flatten during the consolidation process.
- Deep installation exceeding 40 metres in depth.
- Fast and easy installation.
- Proven performance under different soil conditions.

PERFORMANCE OF FLEXI-DRAIN

Successful project accomplishments supplied by Flexi-Drain under various soil conditions are:-

- Construction of roads, highways and expressways.
- Land reclamation for the construction of airport runways of soft soil area.
- Treatment of ex-minefield for road construction.
- Commercial development in ex-agricultural land.
- Treatment for housing development.

The properties and functions of Flexi-Drain in both straight and buckled forms have been extensively researched by well-known independent laboratories. Results of these tests are available upon request.



For full details and technical data, please contact us at

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