



Sustainable Technology

# VACUUM CONSOLIDATION

## Vacuum Consolidation

Vacuum Consolidation offers a highly efficient method of ground improvement for the rapid consolidation of soft saturated cohesive soils that are essentially impervious.

This method of consolidation involves the placement of a sand blanket over the area to be treated, to act as a transition layer between the vertical drains, installed to the base of the soil to be consolidated on a close centered grid pattern, and the horizontal drains laid into the sand blanket to facilitate the removal of water delivered by the consolidation process.

An airtight impervious membrane is used to encapsulate the area of the vacuum treatment and is sealed at the perimeter of the area into a trench extending below the ground water table.

The horizontal drains are connected through the membrane to the vacuum pumps, which when activated cause the creation of a partial vacuum within the soil. This "negative" pressure, relative to atmospheric, effects an accelerated isotropic consolidation throughout the soil mass, generating significant time savings over other methods of consolidation and eliminating the risk of stability failure associated with conventional surcharge loading.



Vacuum Consolidation can be used in isolation or in conjunction with surcharge loading in, for instance, embankment construction, where final embankment loadings exceed the maximum partial vacuum achievable. In fact the method is even more beneficial in conjunction with high surcharge loads, allowing earlier placement of embankments by virtue of the increased stability generated by the partial vacuum in the soil.