MebraDrain

Project report

Kingston, Jamaica

The method
Vertical wick drains can be used for soil stabilization in areas with compressible and water saturated soils. When loads such as road embankments, hydraulic fills or dikes are placed on soft compressible soils, significant settlement may occur and this in turn could create serious problems. MebraDrain installed, evenly spaced, into the depth of the compressible layer, will allow pore water to flow in a horizontal direction to the nearest drain and escape freely, thereby reducing the consolidation period significantly.

The project
The Kingston Container Terminal 5 (KCT 5) project is located at Port Bustamante, Kingston, Jamaica. This reclaimed land is bordered on the east side by KCT 3 and 4 and the Bustamante Port and Highway 2000 on the south, west and north side.

The complete project involves construction of a large container storage area on reclaimed land. A part of this reclaimed land has been in use for over 25 years and does not need any ground improvement works and is suitable for the usage as a container storage. However, soft and variable ground conditions at the reclaimed area west of the Portmore Causeway, make ground improvement works necessary before any storage can take place.

The 2.700.000 metres of vertical drains type MD7007 at KCT 5 have been installed through the already present working platform of about 1 meter thickness. The lower end of the drain will anchor in the stiff clay or dense sand for approximately 0.5 meters.

Equipment
For this project a CAT365 and a CAT330 have been used in combination with standard winch rigs. Pre drilling equipment and a bulldozer with ripper teeth were used to overcome the heavy consolidated top layer of 1-2 metres.

Drain configuration
The maximum depth of the vertical drains has been 18 meters below the top of the working platform. Drains have been installed in a square drain spacing of 1.20 and 1.80 metres.

Review
Drains have been used in a satisfactory way on the areas to minimize settlement during useful life. Surcharge material has been used in several areas during the settlement period to decrease the quantity of drain needed.