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 first Liquefied Natural Gas (LNG) terrain located in the Zaire province (near the city of Soyo) is situated in the delta of the Congo River. A major part of the area exists of reclaimed land. The Western Reclamation Area of the project has been provided with 2.100.000 metres vertical drains type Mebradrain® MD88-H. The vertical drains in the area have been installed through a reclaimed sand layer in order to consolidate the underlying compressible soft clay layer. The bottom part of the drain is anchored in the top level of the very stiff clay layer. The maximum depth of the vertical drains was 25 meters. In a strip besides the north and west boundaries of the Western Reclamation Area the vertical drains have been installed through a sand key. This sand key prevents the slope of the reclaimed sand from sliding. This means that the drains have to be installed through a sand layer with a thickness of approximately 12 meters.

Equipment
For this project a CAT385, 2 CAT365’s, a LH954 and a CAT345 have been used in combination with normal and heavy winch rigs. The CAT385 was equipped with extra counter-weight to ensure penetration in the sand key. 70% of the quantity of the drains have been installed, working 24 hours a day to ensure the milestones of the project. The installation of vertical drains needed to fit the planning of the reclamation of sand by the dredging company.

Drain configuration
Drains were installed up to a depth of 25 meters in a triangular spacing of 1.5 metres.

Review
Drains have been installed in a satisfactory way in the limited time of 8 weeks. Before vertical drains were installed, trails with the installation-sets have been carried out to determine the top of the stiff clay. The maximum depth of an individual drain was set based on the information gained from the computer that registered the installation force of the drain over the full depth.