

Deep compaction, Fredericia

852 plunges increased the angles of shearing resistance



AARSLEFF

Per Aarsleff A/S has carried out deep compaction on an area of 13.500 cubic metres at Port of Fredericia for the construction of eight grain silos and various buildings to be directly founded.

Between 1972 and 1977, the area was backfilled as a part of an extension of Port of Fredericia. The back-filling was made with e.g. marine aggregates. Under the pumped-in sand layers, the underground consists of post-glacial sand layers on tertiary deposits of micaceous clay.

Favourable soil conditions

On the examined part of the area, the tertiary surface was located in approx. level -6. SPT tests in the area showed in general N<10 blows for every 20 cm of penetration, which corresponds to loose deposit, and a plane angle of shearing resistance of 28-30 degrees. This means that the soil conditions are favourable for deep compaction.

Deep compaction

The deep compaction is carried out with a PVE40VM vibrator and a tubular steel pile welded with vibro

wings, an equilateral triangle with a side length of two metres. The vibro wings were installed five metres into the ground and was kept there for 20 seconds with vibration. Subsequently, they were pulled up two metres and kept there for another 20 seconds. Finally, they were pulled up another two metres and kept there for 20 seconds, before we moved on to the next plunge.

Increased angles of shearing resistance

After the deep compaction, we carried out new SPT tests which showed increased angles of shearing resistance of 36-42 degrees between 1 and 5 metres under ground level. This significant improvement allowed direct foundation of the buildings in the area. The work was completed by grubbing and rolling the upper one metre of soil under ground level.



Data

- 852 plunges to 5 m under ground level

Client

Ingeniørfirmaet Læssøe-Simonsen A/S

Contractor

Per Aarsleff A/S

Type of contract

Subcontract

Consulting engineer

Jens Johan Andersen A/S

Construction period

January-February 2018

Contract value

DKK 1.2 million

Aarsleff Ground Engineering is one of Europe's leading piling contractors, and we undertake a wide variety of piling, drilling and foundation projects in Denmark and abroad. We have offices in Poland, Sweden, Germany and the UK.

Our fleet covers fully hydraulic piling and drilling rigs as well as cranes and vibrators.

Contact

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