

SystemFS - geological survey

Product Sheet

With elevations in open areas using driven piles, it is indispensable to carry out surveys to determine the corresponding pile forces. The geological survey is the basis for the creation of the structural analysis of the foundation. In order to get the most exact picture of the situation on location, the following surveys are carried out by our specialists.

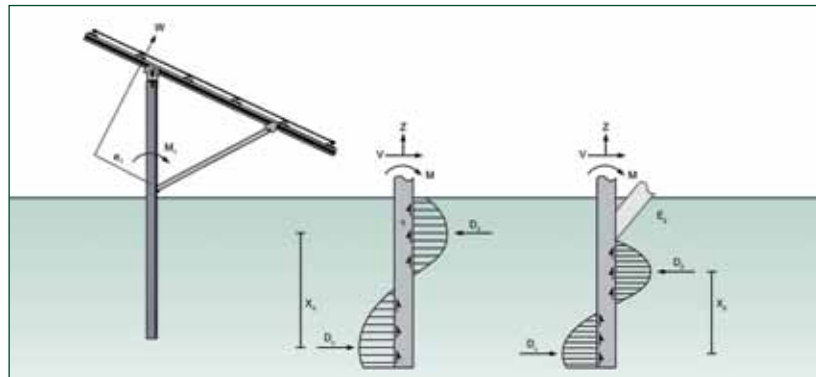
- Inclined pull tests
- Horizontal pressure tests
- Creation of soil profiles
- Chemical analysis in a laboratory



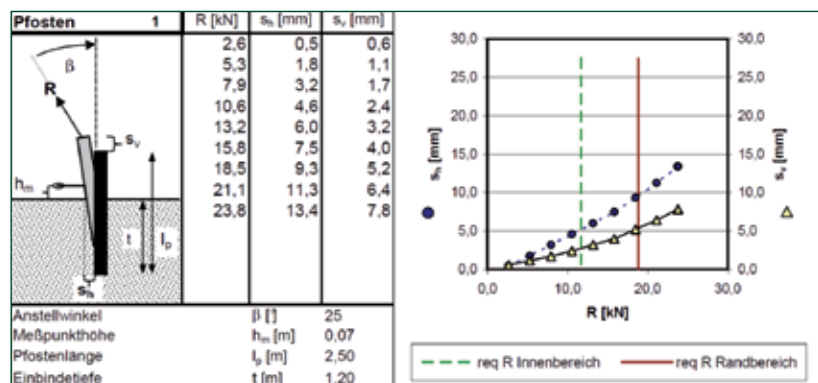
Inclined pull tests

Mechanical background of inclined pulling

The basic idea of horizontal pull tests is the fact that the wind does not act in an isolated manner in vertical or horizontal direction, but impacts the module area almost vertically. Thus, a surface pressure is created from the application of the bending moment in the form of a pair of forces. In case of inclinations of more than 15°, the frictional resistance between the pile and the surrounding ground is usually higher than the jacket friction, which leads to a higher pull-out resistance.



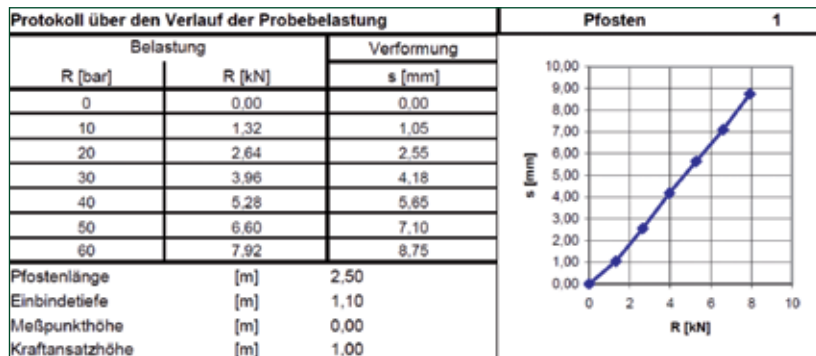
In order to carry out the inclined pull tests, profiles are driven into the ground according to a pre-determined pattern. These profiles are used to determine the behaviour of the pile under the loads predetermined by our structural engineers. The load is applied with a safety factor of 1.3 of the design loads that were determined (regulated by standards).



For this purpose, the lifting and the deformation of the pile under steadily increased load is observed. In doing so, the tensile force is applied in the angle that corresponds to the load impact. The pattern depends on the local conditions. If the soil is very homogeneous, a wider pile distance can be chosen, in inhomogeneous conditions, the pattern is reduced step by step. If very different results are observed, the site is subdivided in several sections and different anchoring depths are defined locally.

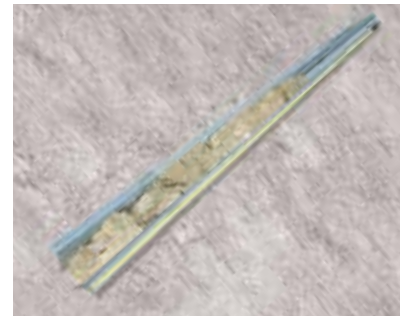
Horizontal pressure tests

This procedure serves for the determination of the bedding modulus (horizontal compressive strength) of the subsoil. With this test set-up, the profiles are pile driven into the ground and loaded with the test load (Safety factor 1.3 of the design loads that were determined).



Creation of soil profiles

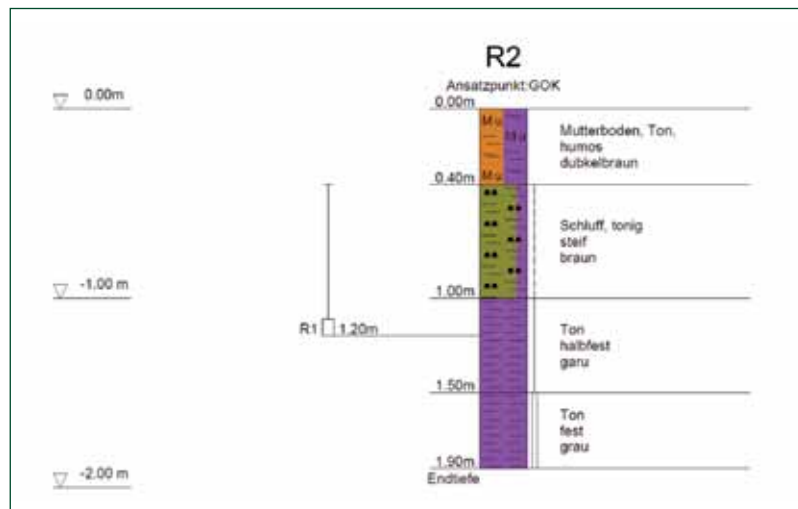
In order to gain detailed knowledge about the layer structure, the driven piles are pulled out again. After that, the soil structure of the multi-layer soil sample that was gained by pulling out the driven pile is determined. On the basis of this multi-layer soil sample gained by pile driving, an evaluation is carried out by our experienced geologists. Moreover, it is determined in this procedure which mechanical efforts will be required for the pile driving operations and the construction of the plant.



Chemical examination

In the course of the chemical examination in the laboratory, the soil samples that were taken on the site are examined regarding steel corrosiveness in order to gain an impression the rusting behaviour in the long run. The evaluation of these samples takes at least 7 days, as solutions are applied on nutrient media.

The evaluation of the results allows an exact conclusion regarding the expectable durability of the steel foundations in the ground (usually much longer than 50 years).



Evaluation

The results of these examinations are compiled in a comprehensive report (German, English, Italian, French, or Spanish) and evaluated in a structural analysis (determination of the anchoring depth). A geological survey only gives an impression of the installation site. An evaluation can only be carried out by a specialized soil structural engineer. In order to get a testable evaluation, this structural engineer must be entitled to officially submit documents.

These surveys are exclusively carried out by our specialists. Surveys from other sources cannot be used for the calculation of the structural analysis of the foundation.