

Increasing Reliability of SPT Testing in Saudi Arabia

Saudi Arabia geotechnical engineers have recently included special requirements for the frequently performed Standard Penetration Test (SPT). This test is widely used to estimate soil strength based on the number of hammer blows (known as the “N value”) required to drive a rod into the ground for 300 mm. Since SPT tests are performed with multiple types of SPT drilling rigs/hammers, the N value can vary from rig to rig on the same soil. This problem is addressed by taking into account the energy transferred to the rod by each hammer. The measured N value is multiplied by Energy Transfer Ratio, which is the ratio between the energy transferred to the rod and 60 percent of the theoretical potential energy of the hammer. Following the recommendations of the **American Society for Testing and Materials**, the Saudi engineers specify that the energy transferred to the rod must be obtained by measuring force and velocity on a rod instrumented with strain gages and accelerometers. Data collected with these sensors can be analyzed either with an SPT Analyzer or with a Pile Driving Analyzer® (PDA) system, both manufactured by **Pile Dynamics, Inc. (PDI)**, to compute the transferred energy. “PDI recently sold an SPT Analyzer to **Fugro Suhaimi**”, said



One of the recently calibrated Ayed Eid Al Osaimi Engineering Office SPT rigs

Anthony Barbieri, PDI’s client service representative for Saudi Arabia, noting that it would be used to calibrate a significant number of SPT drilling rigs. ■