

Case Study

Vacuum Preloading Field Trial

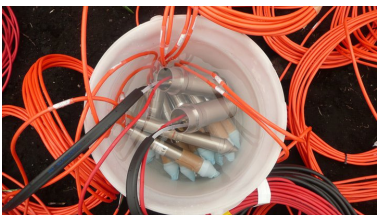
Ireland

Project Summary

PROJECT NAME: Ballydermot Bog

YEAR: 2009

CLIENT: Trinity College Dublin




Overview	Monitoring	Products used
NVM Ltd was commissioned by Eric Farrell of Trinity College Dublin and the National Roads Authority (TCD/NRA) to provide the instrumentation and expertise to carry out the Vacuum Preloading Field Trial at Ballydermot Bog. NVM Ltd, in close affiliation with Geosense Instrumentation UK, provided monitoring instrumentation and in situ backup during the trial. The main objective was to evaluate vacuum preloading as a technique for improving peat ground and its feasibility for improving conditions and reducing the maintenance costs for bog roads and rampart roads. Vacuum preloading is a construction method used to accelerate settlement and increase shear strength by applying a vacuum pressure to the ground by means of prefabricated vertical drains, an impervious tight sheet and a vacuum pump. Consolidating the ground by applying a vacuum load has several advantages over other techniques, for example, no fill material is required, construction periods are generally shorter and there is no need for chemical admixtures.	The TCD/NRA Vacuum Preloading Field Trial commenced on 30th November 2009. The vacuum preloading field trial test covered a 10x10m surface area. Initially, 0.4m depth of the fill layer was excavated over a 12x12m area and levelled. It is important to note that all depths are taken from the original ground level. Ninety-eight prefabricated vertical drains (PVDs) were pushed vertically into the peat to a depth of 2.65m using the bucket of a bog digger and an aluminium box section as the lance. This left approximately 1.35m depth of peat between the base of the PVDs and the peat-clay interface to prevent the escape of the vacuum. The TCD/NRA Vacuum Preloading Field Trial was implemented by NVM Ltd and showed that this technique can be successfully used in peat soils. This was the first time that this technique was used in Ireland.	• Push-in vibrating wire settlement cells • Push-in vibrating wire piezometers (calibrated for both positive and negative pressures) • Surface barometer/thermometer • Stand pipes to monitor the ground water table level • Water meter and rain gauge • Datalogger
Testimonial <i>"On top of reliable, accurate and easy-to-use instruments, I have always found somebody willing to help me every step of the way, from the system design to the installation and monitoring, with a friendly attitude, whether over the phone or on site, even in the worst winter we have seen in 40 years."</i> J.P. Osorio Salas (BEng, MEng), Geotechnical Research Group, Department of Civil, Structural and Environmental Engineering, Trinity College Dublin		