

CASE STUDY

New Reservoir, Dublin Airport.

Project: Construction of a new reservoir at Dublin Airport

Location: Dublin, Republic of Ireland.

Client: John Paul Construction

Project Overview

A 3,000m² reservoir is under construction at Dublin Airport to hold 14,500l³ litres of water for drinking and fire safety use.

The initial project scope included anti-floatation ground anchors which were costly and involved an increased programme time. We were called in to give our expert take on the design and came up with a cost saving piled solution.



Result

The €130,000 contract consisted of the design, installation and testing of a CFA (Continuous Flight Auger) tension piling solution to support the base of the reservoir structure.

The structure requires the piles to act under tension due to the potential up lift as water is withdrawn from the reservoir. This is opposed to a typical load bearing solution for compressive loadings. The piling system also means that the reservoir can be emptied and maintained whilst the structure remains stable.



Originally there was a costly number of anchors planned but we could see that if we used CFA tension piles in a 3m grid matrix then the contractor could save money by reducing their planned 700mm slabs to 450mm and considerably reduce the programme length for both the piling element and slab construction.

One of Van Elle's modern rigs, the Soilmec SF50, was used for the project. The Van Elle fleet, including the SF50 is fitted with the new PL3000 on-board pile monitoring computer system.

This means pile construction data can be recorded for every pile, downloaded in real-time and sent back and forth between any site in Ireland and HQ to ensure quality is monitored constantly on all projects.

This rig achieved high production rates on the job with an average of 30 CFA piles being installed per day. The job was finished on budget and met the reduced programme deadlines.

Passing such a stringent vetting process by an Irish government agency like Dublin Airport Authority shows that we have the credentials and experience the industry is looking for.

Technical information

400 No. 500mm CFA tension piles were installed. The piles were reinforced with a standard steel cage allowing for easy steel connections into the slab.

3 No. tension tests were also carried out to verify the pile design. The tests involve utilising a reaction beam over the test pile and then using a jack system to apply upward force.