

Stressed out in South Carolina

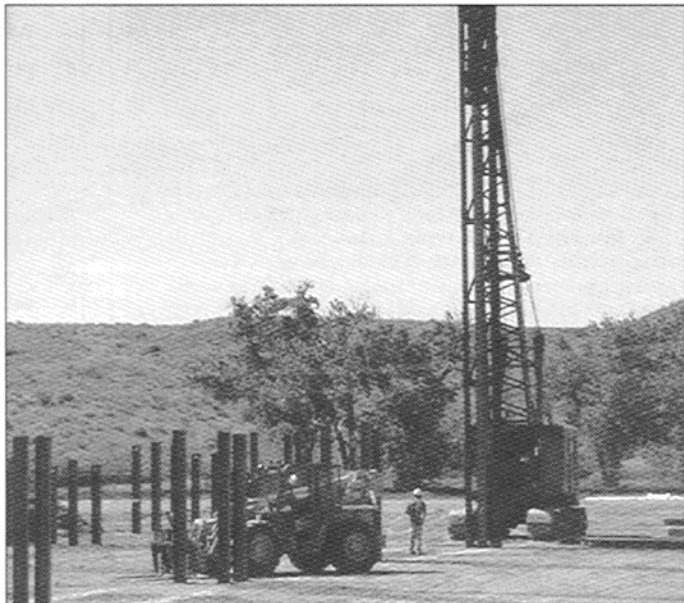
DYNAMIC TESTING of foundations for a new power plant in Fountain, Colorado, USA allowed the planned number of steel H piles to be cut by almost a third.

The original design called for 8,200m of 254mm wide HP10x57 H-piles, with a working stress of 62MPa and a safety factor of two, resulting in an ultimate stress at full capacity of 124MPa on the steel pile area.

Work was carried out by Lawrence Construction Company. The small test programme included driving one test pile and two reaction piles with an APE D19-32 diesel hammer.

The test pile was submitted to a static load test and a dynamic load test performed with Pile Dynamics' Pile Driving Analyzer (PDA). The static load test performed to the ASTM D1143 quick method correlated within 10% of the PDA test result.

A GRLWEAP wave equation analysis was then carried out to investigate the drivability and



Increasing pile capacities saved more than £127,000 on the project.

ultimate capacity achievable with a larger APE D30-32 hammer.

This revealed that the same piles could be driven to a higher

capacity than the initial design proposed. The target ultimate stress was then almost doubled to 242MPa, 70% of the steel's yield strength of 345MPa.

The PDA was used to confirm this increased capacity on 25 "critical" piles that would be subjected to the maximum loading. Because the site investigation showed silty clay over weathered claystone, a number of restrike dynamic tests were also done to ensure there was no relaxation in the soft rock bearing layer.

Dynamic testing was finished using the remote version of the PDA, PAL-R. The CAPWAP signal matching analysis of the data was begun immediately it was collected. This allowed reports to be completed rapidly and final recommendations sent to site.

By increasing the capacities of individual piles, the final amount of piling was reduced to 5,400m, saving the project owner more than \$200,000 (£127,000).