

# DELMAG Diesel Pile Hammers In The UK

ABI Equipment Limited (ABI's UK subsidiary) recently supplied DELMAG D19 and D62 diesel hammers for two separate port projects in the UK.

## Loch Ryan Port Development

This large scale project made use of a DELMAG D62-22 diesel hammer. The civil engineering company McLaughlin & Harvey Ltd. (Newtownabbey, Belfast in Northern Ireland), rented the DELMAG diesel hammer for the construction of a jetty at the new port facility on Loch Ryan near Cairnryan (Scotland). The client, Stena Line, wanted to move their existing North Route port by about 9 miles (approx. 15 km) from Stranraer to Cairnryan. This strategic move is to enable shipping journey times to be reduced by app. 45 min, being closer to the mouth of the Loch, whilst also permitting investment in larger commercial vessels, with the increased channel depth.

Among other things, the project comprises the construction of a 260 m long jetty, dolphins, terminal buildings, maintenance buildings, car parks, etc. Due to the amount of reclaimed land, most of the structures have to be piled.

The jetty is a design and build section of the project and includes a new automooring system. It must also withstand the high birthing forces associated with docking during stormy weather.

The jetty was built in two sections using two different methods to minimise environmental impact and to meet the project schedule. The first 120 m section was built from a stone platform pushed out into the sea, which was then used to install drilled tubular steel piles 36 m in soft alluvian clay. A concrete deck slab was then cast insitu on top.

The next 140 m section was built using the so called "over the top" method. The construction was not carried out from a barge, but instead from the land. An auxiliary piling frame was connected to the previously installed section. It served as a guide template for the driven elements, and ensured stability. The 60 m piles, with a diameter of 914 mm and a pile shoe, con-



*Photo: Aerial image of the job site at Loch Ryan, Detail: DELMAG diesel pile hammer D62 driving raked piles*

sisted of two spliced steel tubes. Three piles were placed in the piling frame by a crane and driven to their final depth. They were then connected to prefabricated 50 tons cross head units whilst also being tied back to the previously installed section with pre-cast planks. After that the piling frame was placed forwards for the next row of three piles, at 6 m spacings, making progress further out to sea.

As piling works were not completed from a barge, there were many external factors removed from the equation (ie. swell, barge stability, logistics). The "over



*Photo: DELMAG diesel pile hammer D19 with swinging lead MS 1202 in Glasgow*

the top” method also allowed a repetitive process with fewer crane operations. With most of the works undertaken during the winter months this was particularly important. The diesel hammer drove a total of 84 vertical piles to final depth. At the end of the jetty another 8 raking piles were installed. To do so, the D62 was equipped with a hydraulic starting device. The 1:3 raking piles consisted of 15 m sections which were driven a further 8 m deeper than the vertical piles, due to the expected tension loads.

McLaughlin & Harvey Ltd. chose the DELMAG diesel hammer for several reasons. The D62 was able to handle the heavy driving task in the existing geology with dense sands at final drive and with a pile shoe. The “over the top” method permitted the finishing works to be carried out directly after the piling work and the absence of a power pack and hydraulic hoses was a significant factor in this process. “The fact that no oil lines and power packs were present considerably reduced the risk of polluting the environment” said assistant project manager Martin McKeown, “in the end, the DELMAG offered us a highly efficient impact hammer with relatively low weight. It proved to be

a cost effective solution for us. The equipment was easy to look after and extremely reliable throughout the entire 12-month period of use.”

### **Kelvin Harbour in Glasgow**

Specialist marine civil engineering contractor LB Marine Ltd. (Lanark, Scotland), was awarded a contract to carry out the pile installation for the construction of the new slipway and mooring jetty on the mouth of the River Kelvin where it flows into the River Clyde, Glasgow for Main Contractor’s Luddon Construction Ltd (Glasgow, Scotland).

LB Marine’s contracts manager, David Gardner, is quite familiar with ABI Group products and had previously undertaken driven piling works on a project at the Govan shipyard in Glasgow using a DELMAG D62-22 diesel hammer. “Due to restricted working space we were limited in our choice of suitable cranes. We were looking for a high energy impact hammer with the lightest possible handling weight. Based on my experience at the Govan shipyard project

I knew that DELMAG diesel hammers offered high power to weight ratios, achieving bearing capacities of hydraulic hammers weighing almost twice as much. The DELMAG D19 offered us a solution with a total weight of just over 7-tonnes and completely eliminated the need for a power pack or hose bundle,” said Gardner.

The construction site is located near the New Transport Museum at Pointhouse Quay in Glasgow. The jetty is for the new passenger ferry between Scotstoun and Govan (districts of Glasgow). For the foundation of the slipway, 16 No piles with a diameter of 508 mm and a length of 24 m had to be installed. First they were vibrated in using an excavator mounted vibrator, then they were back driven using the DELMAG D19-52 with swinging lead MS 1202. Subsequent bearing capacity tests confirmed loadings between 380/450-tonnes had been achieved. Another 10 piles were driven for the floating mooring jetty. In June 2011 the first ships will dock at the new jetty. ■