

Project Fact Sheet

Client – Farrans Construction Ltd

Project – Berth 7 & 8 Combi Wall Installation

Location – Montrose Harbour, Angus, Scotland, UK

Start Date – 16th September 2018

Completion of Piling – 2nd November 2018

Contract Value – Approx. £7.5m

FARRANS



Project Brief – Following on from Farrans successful installation of the south side deep water berth at Montrose Harbour, they were the preferred bidder for berths 7&8 on the north side harbour. The existing berths were dilapidated to a state that significant point loads were no longer deemed safe. Farrans were appointed main contractor to install a new combi-wall running the length of the 2 existing berths incorporating tie back anchor wall and decking piles to form a structural stable berth where ships could dock.

The project was to split into 2 phases starting with phase one to install 72No anchor tubes, 34No combi wall tubes with 33No infill AZ sheets and 2 return AZ sheet pile wing walls.



Project Parameters – With the existing quay walls in disrepair and not able to take point loadings over 10t, the challenge was to come up with a method on installing the combi-wall tubes & sheets **10m** back from the pile line ensuring plant and machinery were not adding stress to existing berths. This meant that standard rig piling works wouldn't be a solution therefore an alternative means of conventional piling was required. The combi wall consisted of 40m long steel tubes 1219mm diameter approx. 2m tube to tube with infill AZ18-700

sheet piles driven between.

Trench Control Ltd. in-house design team got work on designing and fabricating a hydraulic gate that would allow tubes and sheets to be installed up to 10m away from the pile line held by the hitch of a 32t excavator. With accuracy being a premium and to design tolerance of 75mm TCL enlisted the help of Micro-Hydraulics to devise and hydraulic self levelling system which would aid the installation of the tubes and ensure they would be installed plumb and straight.



AutoCad design drawings for fabrication



Trench Control Ltd – Piling & Ground Support Systems





Gate fabricated In Naas workshop

Hydraulic hinged opening

Piling Gate - The piling gate was designed and fabricated in-house at our head office in Naas and on completion was plumbed to the hydraulic system of our Komatsu 360 excavator. The hydraulics are controlled by our the self levelling system which can adjust the position of the gate in all 3 axis to prevent alignment, creep & leaning issues of the combi wall tubes.



Setup for Tube No 1



10m offset from pile line observed



Tube installed through gate



Installation - After tube No1 was installed the gate can be hydraulically plumbed for the next tube by holding the previous one, giving stability to the frame for setting up the next. The auto-levelling system enables the excavator operator that the next tube to be lowered into position is the correct distance away form the previous one and in complete alignment. Once the tubes have been installed in position they are impacted to formation level or refusal.



Impact Hammer

Impact Hammer

Impact hammer drives tube to set



Finished Product – When all 32No tubes had been driven through the gate and impacted to set TCL installed 20m AZ-sheet piles between the tubes to formation level. Some of the sheets required to be impacted to formation level



Final sheets being impacted

Sunset over the harbour

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