

Still worker presses ahead

Noise and vibration have been considered as an inevitable consequence of piling and the resulting disturbance and building vibration reluctantly accepted. However, Still Worker, which was invented about 25 years ago by the Tosa Machinery Industries Co, is described as “virtually noise and vibration free”. Tosa also claim to have 2000 units in regular use in Japan,

Still Worker is a static load type of hydraulic piling machine for pressure insertion and extraction of various configurations of sheet pile with low noise and vibration, making it ideally suitable for work near housing or ancient structures. Typical applications have been:

- Reinforcing the Graeco-Roman Umberto Bridge in Siracusa, Sicily. Still Worker was used to drive piles to create a barrier in order to pump out water and dry up the area near the bridge.
- Canal repair work in Venice. Carried out without damage to fragile surrounding buildings.

The thump of piling, shattering in both its noise and vibration, could be a thing of the past if more attention was given to modern quiet piling systems. A new Japanese entrant to Europe and the USA is Still Worker, currently being used around Europe in sensitive locations.

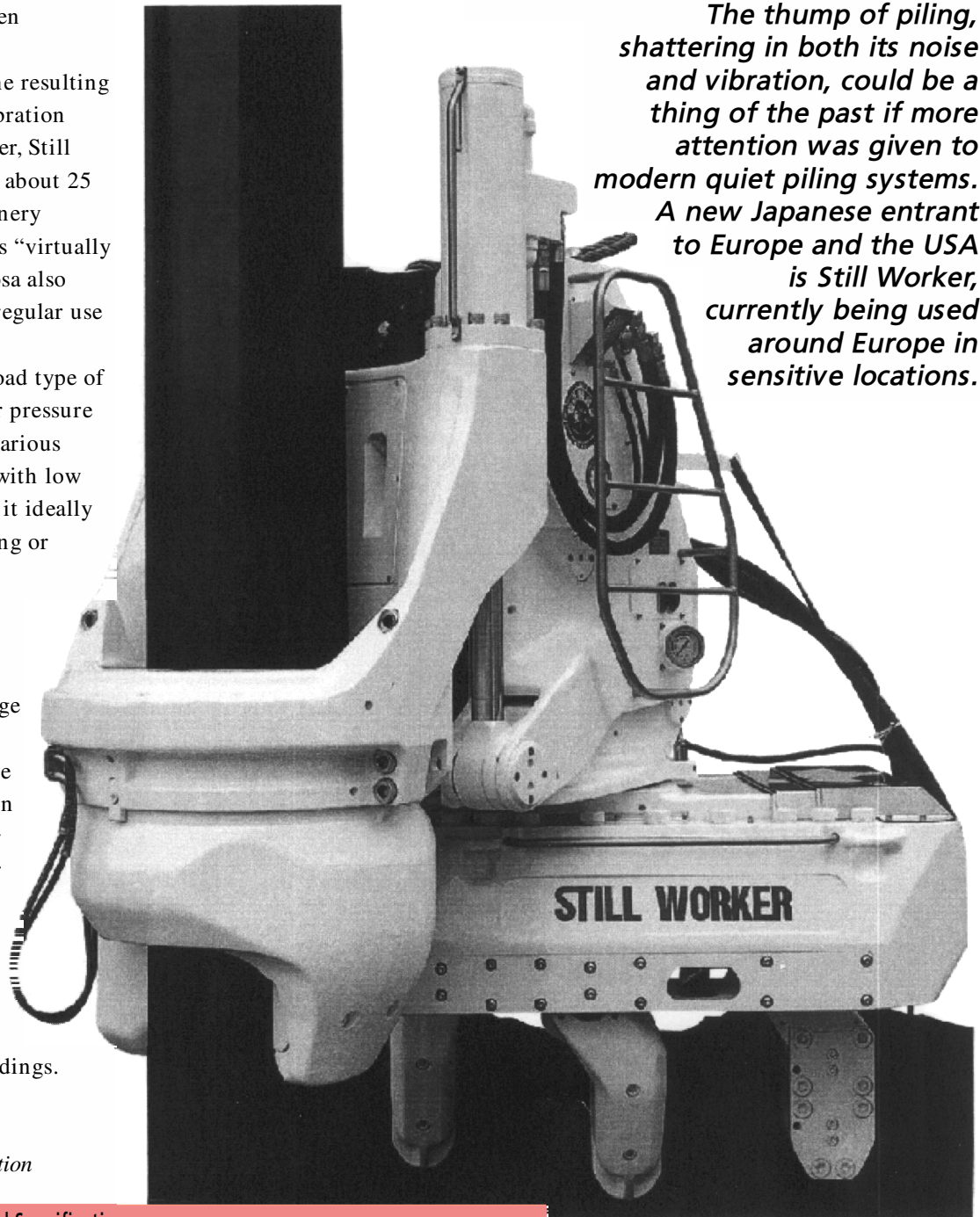


Table 1. Still Worker Specification

Still Worker WP 150 Mechanical Specification	
Driving force	1, 471 kN (150 tonnes)
Extracting force	1,569kN (160tonnes)
Stroke	800mm
Driving speed	1.8 - 23 m/min
Extracting speed	1.9 - 18 m/min
Main unit weight	8,800 kg
Overall height	2550mm
Width along piles	2390mm
Depth	1140mm

Figure 1. Still Worker piling machine

Operation

Still Worker is reminiscent of a large spider. The WP150 is shown in Figure 1 and its mechanical specification in Table 1. The three pairs of legs grip existing piles, whilst the chuck rises to hold the next pile. The chuck can tilt $\pm 5^\circ$ to assist interlocking the new pile into the previous one and then, when everything is firmly gripped, the hydraulic push commences, with a stroke of up to 800mm. At the end of the stroke, the chuck is released and raised before gripping for the next stroke. Piling can be carried out as close as 500mm to existing buildings

Still Worker “walks” along the tops of inserted piles by using the ability of the arm of the chuck to extend horizontally with respect to the main body. Alternate gripping and releasing of the legs and chuck, coupled with horizontal extension and retraction, leads to horizontal body movement and correct positioning for the next pile. The chuck can also rotate $\pm 90^\circ$ with respect to the main body, enabling Still Worker to carry out corner piling.

Overall sound power levels of the Still Worker machines are around 95 – 100dBA, giving sound pressure levels

of about 60 – 65dBA at 20m. Power comes from a hydraulic unit coupled to an enclosed low noise diesel engine. The hydraulic hose is up to 20m long. Control is by radio signals.

Driving resistance is generated when the pile driver clamps onto existing driven piles and drives the next pile into the ground. The resistance is overcome by the force generated by the pile driver, taken up by the driven piles and by the weight of the pile driver itself. At the commencement of the piling, before there are driven piles to attach to, a reaction frame is used, weighted by, for example, piles waiting to be driven. The requirement is that the reaction force exceeds the driving resistance.

A comparison of noise and vibration levels is given in Figure 2. Still Worker is seen to be nearly 40dB lower noise level than a pile hammer, although this is one of those difficult - to - interpret comparisons of noises of different characteristics. Similarly, the vibration levels are nearly 50dB lower than a pile hammer.

For further information:

www.tosakikai.co.jp

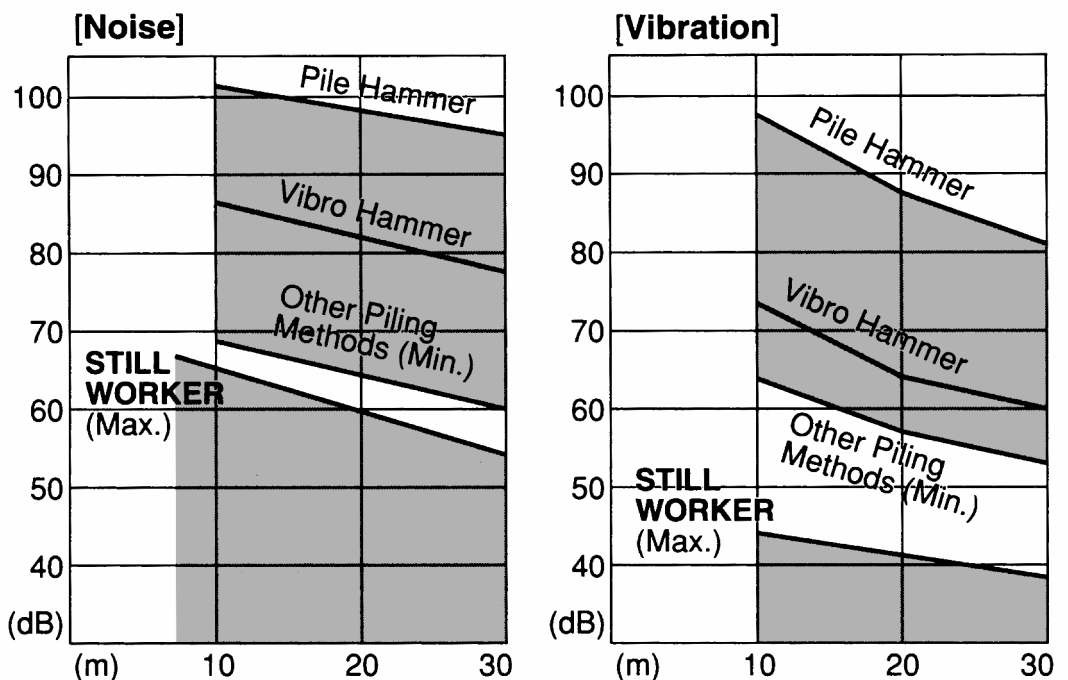


Figure 2. Comparison of noise and vibration of different piling methods