



## DRIVEN PILING IN RESIDENTIAL AREAS

Balfour Beatty Ground Engineering's (BBGE's) technical ability ensures that driven piling can be carried out in residential areas with minimum disruption to neighbouring occupants.

### BASIC TECHNIQUE

Installing driven precast concrete piles adjacent to existing housing is relatively common, particularly in large phased developments. BBGE has undertaken numerous projects where piles have been driven within 5 metres of existing housing. One example is Thamesmead where a number of phases of a large residential development were later followed by phases of the project which were in close proximity to occupied properties.

The principal factors which dictate the suitability of driven piles adjacent to existing residential buildings are: ground conditions; pile loads; distance and the condition of the existing structure.

### GROUND CONDITIONS

Dense or more compact ground, particularly near the surface will tend to increase levels of both noise and vibration.

### PILE LOADS

In general the higher the pile loading the more energy is required to install the pile and therefore the higher the noise and vibration. An exception to this is when a dense granular material is overlain by soft alluvial deposits. In this case, little energy is required to reach the founding strata with hard driving only required for a short duration. The soft alluvial material tends to have the effect of damping vibration at the surface.

### DISTANCE & CONDITION OF EXISTING STRUCTURES

Obviously the greater the distance from the pile to the point of interest the lower the noise and vibration. Also the more structurally sound a building is, the less susceptible it is to damage.



PRECAST PILES DRIVEN TO DESIGN LENGTH



PILE CAPS IN PLACE &amp; BEAMS BEING LAID

### MEASURES TO MINIMISE NOISE & VIBRATION

BBGE can take the following measures to minimise the effects of noise and vibration:

- ✓ A modern, well maintained piling rig and hydraulic enclosed hammer.
- ✓ Suitable packing between the hammer & pile.
- ✓ The orientation of the piling rig.
- ✓ Pre-bore the pile positions.
- ✓ Reduce the hammer drop height.
- ✓ Reduce the pile load & increase the number of piles.

Of these measures, not all may be possible on a given site and some have cost implications. BBGE will also advise local residents about the works & reassure them that works will be carried out with minimum disruption, using the best practical means in the circumstances.

### BENEFITS OF PRECAST PILES

A driven precast concrete pile will generate lower noise & vibration than a driven cast in situ pile for the following reasons:

- ✓ With precast piles the hammer blow is cushioned by a plastic insert and timber packing.
- ✓ Hammer drop heights tend to be lower with precast piles to avoid damage to the pile.
- ✓ The cross sectional area of a precast pile is normally lower for a given load thus less energy is required to cause penetration.



### TECHNICAL CAPABILITIES – DRIVEN PILING

Dimension	From					To
Practical Depth	2.5m					Unlimited (72m longest to date)
Standard Pile Sizes	190mm <sup>2</sup>	235mm <sup>2</sup>	275mm <sup>2</sup>	350mm <sup>2</sup>	400mm <sup>2</sup>	
<i>Note: piles are capable of carrying loads up to 25% more in correct conditions</i>						
Typical Load Capacity	300kN	500kN	800kN	1200kN	1500kN	
Pile Segment Length	3m					15m (1m increments)
Working Height	12m					23m
Typical Rig Weight	36,000kg					67,000kg
Noise Profile at 10m	77-82db (rear of rig)					85-90db (front of rig)

### CONTACT US

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