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Timber is a hugely capable civil engineering material, with the additional advantage of being sustainable. Trees, in particular conifers, make natural piles. Timber foundations may be particularly suitable for countryside structures such as bridges, forest chalets and activity centres, as well as post-and-beam timber buildings in waterfront or flood prone locations. Home grown treated softwood and hardwood timber can offer alternatives to imported tropical hardwoods.

This Digest gives information on the design and installation of timber piling, its history and background, suitable timber species and preservative treatment.

*Installing timber piles  
for beach protection*

*(Photograph courtesy of Aarsleff Piling)*



Although timber piles are rarely used on shore in the UK, in other countries notably the United States, Canada and Australia, they are used widely. For many structures, timber piles are a highly suitable choice of foundation, given appropriate ground conditions. They are economical, easy to transport, handle, cut to length and work with on site; and particularly suited for locations with access difficulties, or where excavations and the delivery of concrete would pose problems.

Short, driven timber piles can be the solution for foundations in ground with a high water table, and where firm strata exists below surface material of loose sand, soft clays, or organic soils. In deep silt deposits, where the capacity of the pile is determined by shaft friction, timber piles are especially suitable being tapered and easy to splice. In Sweden and the Netherlands, timber piles are used below the water table, where they have proved practically invulnerable to decay, and extended to the surface using concrete sections. They are resistant to acidic and alkaline soils, and

soils with high sulphate or free carbon dioxide content. Timber piles can also be driven for ground improvement, to densify loose granular soils.

Preservative treated softwood or durable hardwood timber can be used for the construction of retaining walls, bank seats, and for foundation pads and footings. Recent advances in the development of cost effective wood modification and timber treatment processes will allow much greater use to be made of timber species which are either non-durable or difficult to impregnate. Polymer encasement may be used in conjunction with environmentally friendly preservatives to protect timber.

One of the suggested methods of reducing global warming has been to bury timber to create carbon dumps. Using timber for piled foundations would effectively achieve this.

