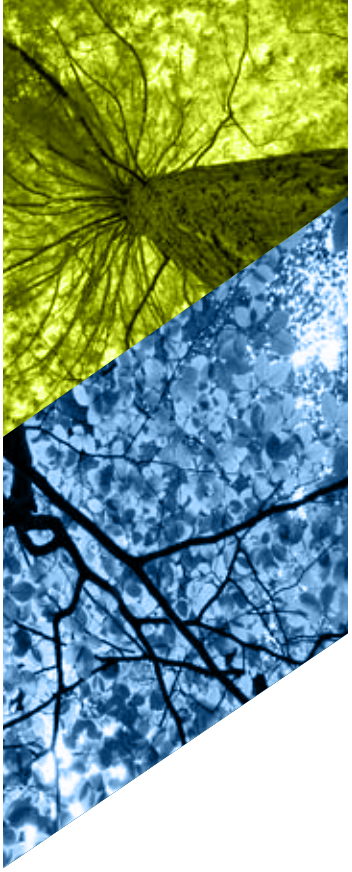

Bridges near trees

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A common problem when developing a site with mature trees is constructing the access road between them without causing harm to their roots. Where the cellular confinement option is not appropriate, an alternative is to build a bridge to lift the roadway above the sensitive area. Similar to the principle of supporting buildings on piles, the structure of the bridge can be supported in the same way. This allows the structure to be installed with minimal excavation and the soil surface remains accessible to air and water, thus minimising the impact on the trees. This 'road on stilts' concept minimises disturbance to the vulnerable rooting environment and allows important trees to coexist with the road.

Case study: Southampton case study

This site is a large development of over 100 units by Banner Homes in Southampton. The only access was along an existing bungalow driveway, very close to two maturing mountain redwood trees. Both trees were prominent in the wider setting because they were in excess of 35m in height and the council planning consent required their retention. Close co-operation between us, Banner Homes and Southampton City Council resulted in the successful installation of the entrance and the trees being retained with very good prospects for their long-term survival.

The two mountain redwoods showing their importance to local amenity before development in 2003.

A closer view showing the existing access to the right and the original bungalow behind the trees.

The bungalow had to be carefully demolished ready for fencing the trees to prevent accidental damage to their trunks.

The pile locations were all hand dug to a depth of 0.75m to ensure that no large roots would be damaged. If roots were found, the pile locations were shifted to avoid them.

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The piling rig was lightweight and its load spread by a temporary surface installed specifically for the process. The auger drilled out the holes, which were then filled with reinforcing steel and concrete to form the piles.

The rows of piles across the entrance were then connected by a concrete beam, which supported the main bridge structure above the ground, thus protecting the sensitive rooting area for the trees.

The concrete bridge is cast on top of the piles (2003) ready for the final surfacing.

The completed development and new access in 2006.

The trees in 2007 are still looking good and with excellent prospects for long term retention.

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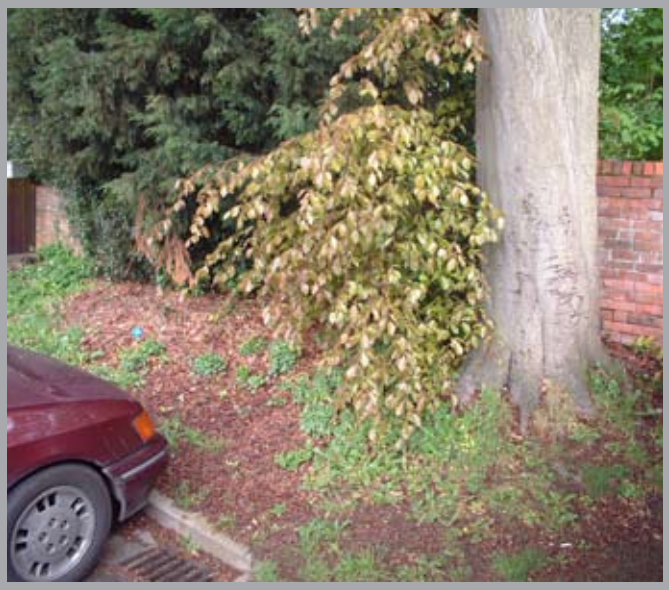
Reading case study

Consent was given for this infill development in 2003, with an entrance right next to a mature beech tree. The tree was very important to local amenity and Reading Borough Council had stipulated that it had to be retained without any damage. Through close co-operation between us, the developer and the council, a piled bridge design was agreed and carefully installed. The tree showed no signs of distress during the construction and was still healthy four years after completion.



The new access had to be a continuation of the existing road through the wall to the left of the tree.

Work started in 2003 by cutting the wall at each side of the access and carefully removing the top, leaving the footings still in the ground to avoid damaging roots. The pile holes were dug by hand to 0.75m depth to ensure that no significant roots had to be cut.

The small diameter piles were installed by a lightweight machine, with their tops sticking out of the ground ready for the fitting of the concrete roadway.

The concrete bridge was cast above ground level, supported by the piles, and the tree is still healthy in 2008.

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