

Trees near buildings SOURCE: ROYAL HORTICULTURAL SOCIETY.

Trees near buildings

APPENDIX TWENTY SIX

Most trees growing near buildings cause no damage, but in some cases, subsidence and structural damage can be linked to tree roots.

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Tree roots can grow far beyond the width of the canopy.

Quick facts

- Most trees cause no damage
- Tree roots spread up to three times the height of the tree
- Modern buildings are seldom affected
- Shrinkable clay soils are most at risk
- Subsidence is worst in dry years

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What is the problem with trees and buildings?

As well as subsidence and structural damage by tree roots, blocked drains and lifted paving may also be a problem. Understanding the factors involved in tree damage to buildings, including soil type and depth of foundations, will help both tree and house owners determine what action to take and when to get professional help.

Structural damage caused by subsidence

- This is generally only a problem on shrinkable clay soils. Buildings up to four storeys constructed before the 1950s are most at risk, as they frequently have comparatively shallow foundations

Drain damage

- Roots may enter and block drains. If the drain leaks, it can lead to the formation of cavities where water flows into the soil. Older drains with poor seals and rigid joints are most susceptible

Physical damage

- Branches can cause damage to roofs and guttering. Suckers and expanding roots can lift paving and lightweight structures, such as garages and sheds, but are incapable of lifting heavier structures

Cause and control

Just how can tree roots cause problems?

- If there is a shrinkable clay soil, during prolonged periods of drought, trees can dry out the soil below the foundations causing the soil to shrink. This shrinking usually reaches a maximum in late summer, and is termed 'seasonal soil moisture deficit' because the soil normally has chance to rewet after winter rains. The movement in the soil can result in **subsidence** of the foundations and structural cracking. Cracks are most likely to develop around windows and doors (note: 5-10mm of movement is usually needed before cracks develop). Less commonly, a permanent soil moisture deficit can develop where the soil continues to get drier at depth year-on-year. In rare cases tree removal on such soils can lead to **heave** (i.e. upward movement of the foundations due to clay expansion rather than shrinkage)
- Tree roots are unlikely to directly penetrate sound footings
- Tree roots will proliferate where water is available, and this is what causes them to grow into drains. If the drains are watertight, then tree roots will not generally trouble them

How can damage be prevented or minimised?

Careful selection of trees for a site where buildings are close by is needed, but this does not mean large trees cannot be planted in a built-up area. The loss of street trees and garden trees in our towns and cities due to an overly cautious approach by insurers and councils is itself a worry, as urban areas need trees to maintain a healthy environment.

It is hard to predict which trees will cause damage because even where conditions mean the risk is high, only a very small proportion of trees will go on to cause subsidence. Risk prediction systems are largely fallible so it is normally best to wait until a tree becomes a real risk (i.e. causes damage) before taking action. Things to bear in mind if you're concerned about trees near houses and other buildings:

- It must be noted that many trees grow near buildings and, in most cases, these will not cause any damage
- However, sometimes trees growing near buildings can cause major problems, especially after a long period of dry weather
- Subsidence is the main problem posed by trees, but there are also the physical threats caused by falling limbs or structural failure of the main trunk
- If you own a substantial tree near a building or public highway, it is well worth having it professionally surveyed every few years to assess its overall health and to determine any pruning or felling requirements. Ensure that you keep these reports in a safe place, as they may be useful in any negotiations with insurance companies or public bodies

Tree legislation

A tree is the property and responsibility of the land owner, who may be liable for any damage caused. Always check with the Local Planning Authority whether a Tree Preservation Order is in place before working on a tree.

Worried about trees and damage?

Trees can cause concern for both tree owners and house owners. See below for Frequently Asked Questions.

Tree owners – Frequently Asked Questions

Is my tree likely to cause a problem to buildings?

This depends on a number of factors. Gardens on non-clay soils (e.g. chalk or sand) are very unlikely to encounter problems with trees damaging buildings. However, if you are on a heavy clay soil, there is an increased risk. In addition, the larger the tree, the higher the 'water uptake' for that species of tree and the closer the tree is to buildings, the higher the risk too.

How to I find out what the 'water uptake' is of my tree?

The book *Tree Root Damage to Buildings* by Biddle P.G (see Further reading) contains a useful table of tree water uptake, listing trees with the lowest demand (posing the least risk) to the highest demand (posing the most risk). **Low water demand trees include:** [broadleaved] *Catalpa*, *Corvus*, *Liquidambar*, *Liriodendron*, *Magnolia*, *Morus*, *Sambucus*, [conifers] *Abies*, *Araucaria*, *Ginkgo*, *Larix*, *Picea* and *Pinus*. **High water demand trees include:** [broadleaved] *Eucalyptus*, *Populus*, *Quercus*, *Salix*, [conifers] *Cupressus*, *Chamaecyparis* and *X Cuprocypris*. *Quercus* (oak) accounts for the highest number of subsidence cases in the UK. Other species generally have an intermediate water demand.

How far from a tree could problems to buildings be caused?

Tree to damage distance will depend on the type and size of tree. Indications of these distances for some tree species can be found in the book *Tree Roots and Buildings* by Cutler, D F and Richardson (see Further reading). As a general rule, for high water demand species, expect soil drying influence to extend outwards from the tree to a distance equivalent to the height of the tree. For intermediate and low water demand species influence is unlikely to extend more than half the tree's height. But remember, other factors contribute to damage occurring and most trees never cause problems for buildings.