

TECHNICAL NOTE NO. 2 – TREES AND THEIR EFFECTS – PART 1

The subject of trees, shrubs and other greenery and their effects on buildings is large. This technical note will therefore be split into two parts. Part 1 will discuss selected tree types while Part 2 will look at some of the effects of trees. Trees on the whole split into two categories, namely Broad-leaf or Deciduous trees and Conifer or Evergreen trees. The distinction is clear in the winter because the Evergreen does not lose its leaves, pines, cones, needles and colour. Deciduous trees lose their leaves every year and change the landscape. There are other growths which have influence such as Ivy not to be underestimated. Some of the factors involved with trees and their effects on buildings are tree type, water demand and availability, soil type, drain runs, topography, location, proximity to buildings, tree height and age of tree and building.



1. Copper Beech - Deciduous



2. Weeping Willow - Deciduous



3. Fir Tree – Evergreen



4. Extensive Ivy Growth on a Roof

Typical high water demand trees are Oak (all varieties), Elm, Poplar, Willow and Lawson's and Monterey Cypress Trees. Trees such as Ash, Horse Chestnut, Plane, Sycamore, Cherry, Douglas Fir, Pine and Leyland Cypress have a moderate water demand. Low water demand trees are Beech and Birch. A tree has what is known as a Zone of Influence around it. As a general rule of thumb trees closer to any property than 0.50-1.25 times the mature tree height will have some effect on the structure. This is not so straightforward in practice and depends upon all the variables listed earlier. In the 'Oak photo no. 5, for example, you will not be surprised to learn that the garage walls were found to have been lifted up 15mm by the tree roots. The ivy growth on the roof of the building in the photograph herein caused havoc inside the building by growing through the walls. The external walls of the 18th century Grade II listed house next to the Copper Beech in the photo no. 1 was found to have extensive cracking and required numerous bar stitching crack repairs.



5. A Splendid Oak - Deciduous

The soil and its moisture content are some of the most important items to consider with adjacent trees. Technically, shrinkable clays, which have the largest influence on foundations with adjacent trees, are those soils with a clay/silt content greater than 35-40% and a plasticity index (PI) greater than 10-15%. Highly shrinkable soils will have a PI value much greater than 40% often into the 50%'s. The next Consulting Engineer's Note will provide examples of the effects of trees on buildings with some guidance on defects and how to spot them.

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