Tree Risk Management

According to the Health and Safety Executive, on average 5 people are killed in the UK each year from falling trees or branches, around half of which occur from trees in public spaces. As far as non-fatal injuries in the UK are concerned, research commissioned by the National Tree Safety Group (ref 1) shows the number of accident and emergency cases (A&E) attributable to being struck by trees to be about 55 a year.

Whilst these figures indicate a low level of risk to human safety, this is not the full picture; importantly, businesses should recognise the risk of tree damage to property and the effect such damage may have on business continuity, which can dramatically impact on the tree risk profile.

Legal Framework

Under both the civil law and criminal law, an owner of land on which a tree stands has responsibilities for the health and safety of those on or near the land and has potential liabilities arising from the falling of a tree or branch. The civil law gives rise to duties and potential liabilities to pay damages in the event of a breach of those duties. The criminal law gives rise to the risk of prosecution in the event of an infringement of the criminal law.

- **Civil Law** - the owner of the land on which a tree stands, together with any party who has control over the tree’s management, owes a duty of care at common law to all people who might be injured by the tree. The duty of care is to take reasonable steps to avoid acts or omissions that cause a reasonably foreseeable risk of injury to persons or property. The duty holder is the person who has control of the tree’s management whether as owner, lessee, licensee or occupier of the land on which the tree stands.

- **Criminal Law** – the Health and Safety at Work etc. Act 1974 places a duty on employers to ensure, so far as is reasonably practicable, that in the course of conducting their undertaking, employees and members of the public are not put at risk.

Under the Management of Health and Safety at Work Regulations 1999, employers and self-employed persons are required to carry out suitable and sufficient risk assessments of their operations, in which hazards are identified and the level of risk assessed to employees and others. This should include a risk assessment of the tree stock on the land which forms part of the undertaking. Breach of the duty under the Act, or the regulations derived from the Act, can give rise to a criminal prosecution against the employer.
**Tree Protection**

There are several ways in which trees in the UK may be protected by law. These include Tree Preservation Orders, Conservation Areas, the Felling Licence system, Restrictive Covenants, and planning conditions. Prior to undertaking work on a tree, it is important that the local Council is consulted to ascertain whether any legal restrictions apply. Failure to do so may result in prosecution.

**Risk Management Strategy**

Recent years have seen an increasing level of concern and uncertainty over the safety management of trees, which has been stimulated by a number of court cases and other responses to rare incidents where a falling tree has resulted in death or serious injury. Addressing these concerns requires an understanding of the “real” level of risk, ensuring that a balanced approach is adopted, and that risk control measures are a proportional response to the risk exposure. Typically, this will include, but is not limited to, consideration of the following aspects:

- A key starting point of an effective tree risk management programme is to **assess the usage of the land** on which the trees stand, together with the estimated loss in monetary terms of any property exposed to damage and, for businesses, the potential impact on business continuity (the target risks). This will inform the process of tree assessment. Where large tree stocks are encountered, this may involve, as far as the life safety risk is concerned, the practice of zoning, in which landowners and managers define areas of land according to their use from which tree inspection can be effectively prioritised, focusing resources where most needed.

- Determining the extent and nature of the tree stock by species, age, condition, etc.

- Where necessary, conducting tree inspection to identify and assess obvious defects.

- Managing the risk at an acceptable level by identifying, prioritising and undertaking safety work according to the level of risk.

The best person to conduct an initial review of the site will normally be someone who is familiar with the land and how it is used including, where appropriate, the nature of the premises and business operations conducted and the nature of the trees present. This typically could be the landowner, occupier or land/business manager. **Specialist intervention will normally only be required in cases of perceived “high risk”**.

In some cases, a method of quantified tree risk assessment may be advisable. This can be highly beneficial in obtaining an **accurate risk profile** enabling tree managers to balance safety with tree values and operate to predetermined limits of tolerable or acceptable risk. One such system, developed and marketed in the UK by **Quantified Tree Risk Assessment Ltd.**, is highly respected and has been adopted by many local Councils throughout the UK for their assessment of the tree risk in parks and other public places. Details of this risk assessment method can be found at [www.qtra.co.uk](http://www.qtra.co.uk).

**Tree Inspection**

There are three recognised forms of tree inspection, the extent of which is needed should be governed by the outcome of the risk assessment:

- **Informal observations** – these are essentially the ongoing, day-to-day observations made by owners, occupiers and employees of a site.
who have good local knowledge of the trees and location, and see them during the course of their daily lives and work. Defects reported by employees or the general public are a fundamental part of informal observations and should be acted upon.

- **Formal inspections** – these involve a specific visit to a tree for the sole purpose of performing an inspection, ranging from survey work for tree inventories, to health and condition assessments. This is an important method of identifying when further action is needed, including immediate tree surgery or further detailed inspection. Persons conducting formal inspection would not normally require a specific tree-related qualification, but would need to possess sufficient knowledge to be able to recognise serious ill health or significant structural issues.

The frequency of formal inspection should be determined as a consequence of the risk assessment and the zoning of the site, in which trees are categorised for periodic inspection, depending on the risk exposure. Inspections should also be carried out immediately after any exceptionally severe weather event that might have caused damage to trees.

- **Detailed inspections** – these involve an initial ground-level, visual assessment of a tree by a specialist contractor looking for structural failure, which may be followed by a more detailed examination, including using specialist diagnostic tools. Such inspections would normally be reserved for trees valued for their heritage, amenity or habit and which are suspected of posing a high level of risk.

The subject of tree risk management would not be complete without addressing the potential risk of subsidence and structural damage caused by tree roots.

In the UK, it is uncommon for tree roots to cause direct physical damage to sound foundations and in rare circumstances is likely to only occur a tree is planted extremely close to a building, or where dead tree roots decay, causing the formation of cavities below the foundations. Most reported damage is secondary in nature and occurs when trees are planted in soil types which shrink considerably on drying, mainly consisting of clay and some peaty, fen soils.

During prolonged periods of drought, trees in close proximity to buildings can dry out the soil beneath the foundations causing the soil to shrink, potentially leading to subsidence of the foundations and cracking in the building’s superstructure. **Buildings up to four storeys in height, constructed before the 1950’s are considered to be most at risk**, as they frequently have comparatively shallow foundations. Whilst Building Regulations over the years have evolved requiring more substantial foundations, it **should not be assumed** that **modern buildings erected on shrinkable clay are immune** from subsidence damage.

Whether appointing a specialist Arboricultural Consultant for detailed tree inspection or a Tree Surgeon to remedy defects, it is recommended that they are selected from a recognised accreditation scheme such as that operated the Arboricultural Association, which can be searched at www.trees.org.uk/Find-a-professional

Trees and Building Foundations

The subject of tree risk management would not be complete without addressing the potential risk of subsidence and structural damage caused by tree roots.
Most trees in the UK have a significant radial root system, extending one to one-and-a-half times the height of the tree. With some species, this can be even greater.

**There are no hard and fast rules relating to minimum safe distances between trees and buildings.** This is a complex issue in which due regard should be taken of several factors, including the species and variety of the tree, the precise nature of the soil, foundation design and climate.

Reliable studies (ref 2) have been conducted in the UK of insurance subsidence claims data where tree roots were implicated, collated from information obtained in the field during arboricultural surveys and site investigations, in which the results of the maximum straight line root spread recorded for various species of tree are summarised in the following table:

<table>
<thead>
<tr>
<th>Tree species</th>
<th>Maximum root spread (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple, Birch, Pear,</td>
<td>10</td>
</tr>
<tr>
<td>Cherry, Plum, Peach, Mountain Ash</td>
<td>11</td>
</tr>
<tr>
<td>Hawthorn</td>
<td>12</td>
</tr>
<tr>
<td>Plane, Beech</td>
<td>15</td>
</tr>
<tr>
<td>Cypress, Lime, Maple and Sycamore</td>
<td>20</td>
</tr>
<tr>
<td>Ash</td>
<td>21</td>
</tr>
<tr>
<td>Horse Chestnut</td>
<td>23</td>
</tr>
<tr>
<td>Poplar, Oak</td>
<td>30</td>
</tr>
<tr>
<td>Willow</td>
<td>40</td>
</tr>
</tbody>
</table>

**Inherently variable** and can depend of several factors which may not be taken into account in a simplistic ‘straight line’ approach. As a result, a more balanced view should be taken having regard to the individual circumstances, which in some cases can lead to recommended safe planting distances being reduced from the figures shown, sometimes by as much as 50%. Equally, distances in excess of those in the table may on rare occasions have to be taken into consideration.

In addition to subsidence, the risk of heave also requires to be considered. Felling and removal of existing trees is often seen as an immediate remedy to any future potential subsidence risk. However, by doing so, the risk of heave can be introduced in which an upward movement of the site is caused by expansion or swelling of the subsoil, resulting in structural damage. Heave is most commonly caused by the removal of trees and other vegetation, causing the clay subsoil to re-wet and swell.

Whether obtaining an assessment of the tree risk in relation to subsidence or advice regarding felling, it is strongly recommended that the services of an Arboricultural Consultant, accredited by the Arboricultural Association is employed.

**References**


**Disclaimer.**

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