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## Introduction

Your comments on this draft are invited and will assist in the preparation of the resulting British Standard. If no comments are received to the contrary, this draft may be implemented unchanged as a British Standard.

Please note that this is a draft and not a typeset document. Editorial comments are welcomed, but you are advised not to comment on detailed matters of typography and layout.

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BRITISH STANDARD

# Recommendations for tree safety inspection

ICS x.xxx.xx

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British Standards

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## **Foreword**

### **Publishing information**

This British Standard is published by BSI and came into effect on XX Month 200X. It was prepared by Technical Committee B/213, *Trees*. A list of organizations represented on this committee can be obtained on request to its secretary.

### **Information about this document**

This is a new British Standard that has been prepared in order to provide authoritative recommendations and guidance on tree inspection for health and safety purposes.

### **Use of this document**

As a code of practice, this British Standard takes the form of guidance and recommendations. It should not be quoted as if it were a specification and particular care should be taken to ensure that claims of compliance are not misleading.

Any user claiming compliance with this British Standard is expected to be able to justify any course of action that deviates from its recommendations.

It has been assumed in the preparation of this British Standard that the execution of its provisions will be entrusted to appropriately qualified and experienced people, for whose use it has been produced.

### **Presentational conventions**

The provisions in this standard are presented in roman (i.e. upright) type. Its recommendations are expressed in sentences in which the principal auxiliary verb is “should”.

*Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.*

### **Contractual and legal considerations**

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

**Compliance with a British Standard cannot confer immunity from legal obligations.**

## **Introduction**

Trees are dynamic living organisms capable of achieving considerable size and structural complexity. The laws and forces of nature dictate a natural failure rate even among intact trees: by their very nature trees cannot be considered entirely free of risk, though this is generally present at very low and acceptable levels.

Trees are exposed to and can become damaged by the elements, and have co-evolved with pathogens that can degrade and sometimes destroy their structural integrity. Due to genetic characteristics and local microenvironmental factors, this integrity may be innately uncertain.

Where trees grow in areas of public access or within falling distance of man-made structures (collectively termed “targets”), branch shedding or whole tree failure can potentially cause severe harm, including loss of life.

Owners or occupiers of land have a duty of care (see Annex A) that could have implications for tree management, including proactive inspection and maintenance.

It is important that people having or taking ownership of or responsibility for trees (collectively termed “tree owners”) are aware of their condition. Tree inspection (see Clause 4 and Clause 7), provides relevant information to inform management decisions and demonstrates that care has been taken. This will be enhanced by carrying out any recommended actions (see BS 3998:2008).

The inherent risks associated with trees mean that it is a mistake to manage them in an overly risk-averse manner. In addition to considerations of tree safety, it is important that management decisions are taken in light of their wider benefits (aesthetic, ecological, environmental and sociological). Management decisions to address identified hazards that exceed what is necessary to the detriment of these benefits are inappropriate.

Finally, attractive and/or notable trees can be severely damaged by structural failure so as to threaten their viable retention: in such cases, expert inspection to identify tree work to prevent major collapse can be justified on purely arboricultural grounds.

### **1 Scope**

This British Standard addresses considerations arising from the need to inspect trees in order to assess, and if necessary reduce their potential for structural failure.

This standard does not apply to other risks associated with trees (such as obstruction of highway visibility, slip and trip hazards and tree root damage to buildings).

It is aimed at tree owners and managers, and at all those designing tree inspection regimes and undertaking tree inspections.

### **2 Normative references**

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS 3998:2008, *Recommendations for tree work*

### **3 Terms and definitions**

For the purposes of this British Standard, the following terms and definitions apply.

### **3.1**

#### **competent person**

person (e.g. an arboriculturist) who has training and experience relevant to the matter being addressed and can demonstrate competence to undertake systematic expert tree inspection, in order to identify and recommend remediation for hazards arising from impaired structural integrity in trees

### **3.2**

#### **decay**

enzymatic alteration of wood by specialized fungi leading to a biodegradation of the load-bearing properties of affected trees and their constituent parts

### **3.3**

#### **decay mapping**

examination by invasive or non-invasive means of the internal tissues of a tree, including above and below ground parts

*NOTE Used to determine the extent and significance of decay initially identified by visual tree assessment (VTA).*

### **3.4**

#### **hazard**

source or situation with a potential for harm in terms of death, ill health or injury, or a combination of these

(BS 8800:2004, 2.5)

*NOTE Tree inspection is a process of hazard identification.*

### **3.5**

#### **hazard tree**

tree in such a condition that structural failure is expected with the potential to result in harm to persons or property (see 3.9)

*NOTE Trees can have wholly internalized structural weaknesses, including decay, which are not apparent on visual inspection, such that their failure, should this occur, is not reasonably foreseeable*

### **3.6**

#### **risk**

combination of the likelihood and consequence(s) of a specified hazardous event

(BS 8800:2004, 2.16)

### **3.7**

#### **risk assessment**

process of identifying hazards and evaluating the risks to health and safety arising from these hazards taking account of the existing risk controls (or, in the case of a new activity, the proposed risk controls)

(BS 8800:2004, 2.17)

### **3.8**

#### **risk control**

selection and application of suitable measures to reduce risk

(BS 8800:2004, 2.18)

### **3.9**

#### **target**

persons or objects, the latter having variable value and vulnerability, present, perhaps temporarily, within falling distance (or impact radius) of a tree or its branches



### **3.10**

#### **tree inspection**

visual assessment to determine various attributes of trees as determined by the level of arboricultural knowledge of the person concerned

*NOTE Different levels of inspection are defined in 3.10.1 to 3.10.4.*

#### **3.10.1**

##### **lay**

rudimentary inspection by untrained persons (e.g. owners of trees at private residential addresses) that might identify very obvious potential hazards and/or significant change, so as to prompt, where appropriate, an inspection by a competent person

*NOTE Very obvious potential hazards and/or significant change include to their growing environment (e.g. loss of an adjacent tree formerly providing shelter), presence of fungal fruiting bodies (e.g. brackets and toadstools), large dead branches, broken or storm damaged parts and partial uprooting (including root damage resulting from adjacent excavation).*

#### **3.10.2**

##### **basic**

preliminary but systematic inspection undertaken (possibly using binoculars, mallet and probe) by a person trained to observe obvious potential hazards (e.g. tree warden, park ranger, or highway safety inspector) so as to inform, where appropriate, a risk control decision, including inspection by an expert

*NOTE Obvious potential hazards include altered exposure, large dead branches, crown decline, exudates on trunks, presence of fungal structures, cankerous lesions, cavities, compression forks, cracks/splits, dead/peeling bark, injury (including lightning strike), wilting, thinning of foliage and severed roots (including root damage resulting from adjacent excavation).*

#### **3.10.3**

##### **expert**

systematic and diagnostic process of visual inspection by a competent person (e.g. an arboriculturist) from ground level using binoculars, mallet and probe as necessary in order to gain sufficient understanding of a tree's structural condition, so as to inform, where appropriate, reinspection interval and management recommendations (risk control measures) including detailed inspection (see 3.10.4)

#### **3.10.4**

##### **detailed**

specialized examination identified as being necessary during expert inspection by a competent person (e.g. an arboriculturist), variously comprising aerial access to view upper parts of the tree, or the use of specialized (e.g. decay mapping) equipment

*NOTE 1 Those undertaking basic, expert and detailed inspection need to have professional indemnity insurance.*

*NOTE 2 The practice of inspecting trees in the United States from a moving vehicle with two people (one driving, one inspecting, known as "windshield inspection") has proved an efficient and economical way to cover many miles of tree-lined roads. However, the practicalities are greatly reduced when carried out in an urban environment. Research of the efficacy of this approach has demonstrated an 89% correlation of hazard assessment given to trees based on defects found, when the same trees were subsequently assessed by an inspector on foot<sup>1)</sup>.*

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<sup>1)</sup> Research carried out by Christopher Rooney a Graduate student of University of Massachusetts and reported at the ISA conference in Montreal in August 2003.

### **3.11**

#### **visual tree assessment (VTA) [1]**

method of tree inspection used by arboriculturists to evaluate the structural integrity of a tree, relying on observation of biomechanical and biological features including decay and fungal structures

## **4 Factors to consider**

### **4.1 Timing of inspections**

#### *COMMENTARY ON 4.1*

*Due to the reliance of expert inspection on visually apparent symptoms as diagnostic aids, inspections undertaken at differing times of the year present a variety of benefits and obstacles. For example, inspecting a tree in full leaf assists in determining physiological condition from foliage quality, but is hindered by leaves obscuring the tree's structure. Conversely, inspecting a deciduous tree in bare branch condition allows a good view of the structure but no assessment of foliage.*

Successive expert inspections should, where practicable, be undertaken at differing times of year (unless there are indications to the contrary; see Clause 7), as this facilitates inspection under a range of conditions (albeit over time).

*NOTE It is important that inspection regimes are implemented and reviewed, and that records are maintained.*

### **4.2 Prioritising inspections**

#### *COMMENTARY ON 4.2*

*People or organisations with responsibility for large numbers of trees might need to prioritize their inspections (however this does not negate the recommendation for quinquennial inspection: see Clause 7).*

A prioritized inspection schedule should be undertaken based on levels of access (i.e. exposure of people to hazard) and arboricultural advice, taking account of relevant factors (where known) that affect safety such as the age class, condition, size and species of the trees.

Where exposure increases, for example an outdoor concert held in a normally unoccupied park, the inspection regime should respond to the changed demands of the site usage, to ensure that appropriate and effective risk controls are provided (see Clause 6 and Clause 8). BS 8800:2004, 3.5.3, states (in part):

A risk assessment should always be carried out, and the control measures implemented, before changes are made to work activities or before new activities commence.

### **4.3 Data recording**

#### **4.3.1 General**

The data to be recorded varies with the level of inspection and should reflect the findings.

Lay and basic inspections need not be as exhaustive as expert inspections, though any observations giving rise to concern over tree safety should be recorded (together with the date) and referred for expert inspection in a timely manner (i.e. as soon as can reasonably be arranged).

#### **4.3.2 Basic inspection**

Those undertaking or managing basic inspections should retain a written record of:

- a) date of inspection;

- b) name of person undertaking the inspection;
- c) trees inspected (listed by common name, or identification number referenced to a tree tag or a plan) and/or the specific location or area (zone) in which trees were inspected;
- d) any obvious hazards observed;
- e) any limitations preventing inspection to the required level;
- f) species (listed by common name) and location or identification number of the hazard trees concerned;
- g) action taken (including referring the trees concerned for timely expert inspection).

### **4.3.3 Expert inspection**

For expert inspection, the minimum data recorded (and retained) should be:

- a) date of inspection;
- b) name of person undertaking the inspection;
- c) trees inspected or the specific area (zone) in which trees were inspected;
- d) identification and location of individual hazard trees;
- e) species (by common and scientific name);
- f) age class;
- g) significant defects present assessed as being hazardous;
- h) any limitations preventing systematic inspection;
- i) recommended actions (if required);
- j) timescale for implementing the recommendations (based on the risk posed);
- k) interval to and preferred time of year for the next expert inspection.

*NOTE 1 Optional data could include, for example, tree dimensions.*

*NOTE 2 Trees not found to have significant defects, and/or not directly threatening an identified target, need not be recorded during the inspection [2]: providing that the date of inspection and the area inspected are recorded, it can be assumed by implication that all trees present within the area have been inspected. This may be appropriate particularly where large numbers of trees are involved and the practicalities of identifying each tree are unrealistic and uneconomical.*

Recommendations for risk control measures (see Clause 8) should be reported to the level of management or person with the authority to initiate the necessary action.

### **4.4 Climatic considerations**

#### *COMMENTARY ON 4.4*

*Severe weather conditions can damage and so weaken the structure of trees, causing primary failure, thereby predisposing them to secondary failure (i.e. collapse).*

*Example conditions include:*

- *strong winds (especially of Force 8 or greater), particularly from atypical directions;*
- *heavy rain reducing root adhesion due to soil saturation;*
- *heavy snowfall leading to branch failure.*

Consideration should be given to implementing at least basic inspections in the aftermath of storm events, especially for trees previously identified as being

particularly vulnerable, and/or for those standing adjacent to high-value targets (e.g. trunk roads).

Trees known to have been struck by lightning should be inspected as soon as is practicable thereafter.

#### **4.5 Ivy and other climbing plants**

Ivy and other climbing plants can obscure the structure of a tree preventing thorough inspection. The target and risk should determine the need for inspection via aerial access (climbing inspection or inspection from a hydraulic work platform), or the removal of the plants concerned prior to inspection.

Ivy and other climbing plants can provide a valuable wildlife habitat and may harbour protected species (attention is drawn to relevant legislation, summarized in Tree Damage Alert No. 123 [3]). Such plants should, therefore, only be removed where this is essential to allow thorough inspection (usually at expert level).

### **5 Legal and related considerations**

The following documents should be considered when planning and/or undertaking tree inspections:

- Government Circular 90/73 (reproduced in part in Annex B), Inspection, Maintenance and Planting of Roadside Trees.
- Government Circular Roads 52/75 (reproduced in full in Annex C), Inspection of Highway Trees.

*NOTE 1 See also the Network Maintenance Manual (Highways Agency 2007) [4] and Well Maintained Highways: Code of Practice for Highway Maintenance Management, (Department for Transport 2005) [5] (see Annex A).*

*NOTE 2 See Annex A to Annex C for detailed information on legal considerations, including statutes and case law.*

### **6 Quantifying the risk from hazard trees**

Where consideration is being given to the retention of a hazard tree in identifiably poor structural condition, a detailed assessment should be undertaken to quantify the associated risk and a written record retained.

*NOTE Such quantified risk assessments can also be employed in other cases.*

Where tree risk is to be quantified, the following factors should be considered:

- a) likelihood that an identified defect (including decay) will lead to structural failure;
- b) nature of the target (see also 4.2);
- c) consequences for the target concerned of an impact from the defective part (i.e. scale of impact relative to durability of target).

These three factors should be systematically assessed and considered in combination in order to determine the risk posed by the tree concerned, and to confirm its suitability for retention, including where this is only acceptable through implementation of risk control measures (see Clause 8).

*NOTE Various proprietary methods are available for use by arboriculturists in analysing the inter-relationships of the factors referred to above. Whilst such methods can assist in managing hazard trees, the judgement of a competent person (e.g. an arboriculturist) remains the most reliable analytical tool.*

## **7 Frequency of inspections**

### **7.1 Lay inspection**

It is generally accepted that layman tree owners should be familiar with the condition of their trees, most suitably facilitated by regular observation and/or annual inspection.

### **7.2 Basic inspection**

In the case of basic tree inspection, the interval between inspections should be driven by site usage, though annual inspection is usually appropriate for targets such as well-used highways.

*NOTE A two to three year cycle may be appropriate for less frequented sites.*

### **7.3 Expert inspection**

The maximum interval between expert inspections where a target is or foreseeably may be present should be five years.

*NOTE Departure from this recommendation may be justified where there is identifiably infrequent access, recorded as such at a strategic level.*

Within this maximum parameter, the interval between systematic expert inspections should be varied in order to take account of a tree's condition and context, including site usage and changes in circumstances and growing conditions. The interval should also take account of the findings of each previous expert inspection, and those of any lesser inspections undertaken in the meantime.

The precise timing of inspections should reflect the nature of any defects known to be present (e.g. seasonally occurring fungal structures; see also 4.1), and should also address, where possible, any limitations that formerly reduced the effectiveness of a prior inspection (e.g. dense foliage; see also 4.5).

The competent person (e.g. arboriculturist) undertaking an expert inspection should identify the appropriate interval to, and preferred time of year for, the next scheduled expert inspection.

## **8 Remedial action**

### **8.1 Target management (non-arboricultural intervention)**

Where defects are identified that are assessed as posing an unacceptable risk, thereby requiring risk control measures, consideration should firstly be given to modifying the target, including:

- a) exclusion (e.g. erection of barriers or establishment of deterrent plants such as blackthorn);
- b) diversion (e.g. re-routing paths away from the tree);
- c) relocation (e.g. moving benches from under the canopy spread).

### **8.2 Tree work (arboricultural intervention)**

Due to the various benefits conferred by trees (including habitats protected by law), risk control measures should be directed specifically at remediating the identified potential hazards. For example, a large dead branch identified as hazardous but also having habitat value should be considered for partial retention by truncation rather than complete removal (see BS 3998:2008 para.???)

*NOTE Options for arboricultural intervention are set out in BS 3998:2008.*

## **Annex A (informative)**

### **Legal and related considerations**

#### **A.1 Statutes**

##### **A.1.1 The Occupiers Liability Act 1957 & 1984 [6]**

Section 1(1) of the 1957 Act and section 1(1)(a) of the 1984 Act define the scope of the Acts in regulating the duty which an occupier of premises owes “in respect of dangers due to the state of the premises or things done or omitted to be done on them”.

The 1984 Act extended the scope of duty of care to “others” (i.e. those present on land uninvited), though three additional criteria need to be met before any duty is owed. These criteria are set out at section 1(3) of the 1984 Act:

“An occupier of premises owes a duty to another (not being his visitor) in respect of any such risk as is referred to in subsection (1) above if – (a) he is aware of the danger or has reasonable grounds to believe that it exists; (b) he knows or has reasonable grounds to believe that the other is in the vicinity of the danger concerned or that he may come into the vicinity of the danger (in either case, whether he has lawful authority for being in that vicinity or not); and (c) the risk is one against which, in all the circumstances of the case, he may reasonably be expected to offer the other some protection.”

The duty under both Acts applies to those who occupy the land, i.e. those who have a sufficient degree of control over it such that they ought to realize that any failure on their part could result in injury to those visiting (whether invited or not) or passing by. Two or more parties can simultaneously be occupiers, each with the same duty towards visitors/passers by.

The duty should be thought of as a requirement to take what care is reasonable, under all the circumstances, to ensure that the visitor/ passer by is reasonably safe. This includes a consideration of the circumstances of the occupier(s) and the reasonable availability of measures to prevent injury.

##### **A.1.2 The Health and Safety at Work etc Act 1974 [7]**

This Act requires that risks to employees and also third parties be reduced so far as is reasonably practicable. Section 3 of this Act has been used by the Health and Safety Executive to prosecute a local authority following fatalities arising from tree failure. Section 3(1) states:

“It shall be the duty of every employer to conduct his undertaking in such a way as to ensure, so far as is reasonably practicable, that persons not in his employment who may be affected thereby are not thereby exposed to risks to their health or safety.”

##### **A.1.3 The Local Government (Miscellaneous Provisions) Act 1976 [8]**

Section 23 of this Act provides local authorities with the power to make safe imminently dangerous trees on land under third party ownership. The power extends to a recovery of any costs incurred by the authority in exercising the power.

##### **A.1.4 Highways Act 1980 [9]**

Section 130 confers on highway authorities a duty in law to “prevent, as far as possible, the stopping up or obstruction” of highways.

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Section 154 of this Act provides highway authorities with the power to require any vegetation that threatens the safe use of any highway, or other road or footpath to which the public have access, to be cut or felled within 14 days. The power under section 154(1) relates to “danger”, “obstruction” and “interference” with the operation of the highway, including endangerment, impeding passage of vehicles, horseriders and pedestrians, and restrictions of visibility.

Section 154(2) of the Highways Act 1980 is designed to address dangers arising from hedges, trees and shrubs that are “dead, diseased, damaged or insecurely rooted”, such that the whole or a part “is likely to cause a danger by falling on the highway, road or footpath”.

### **A.2 Non-statutory guidance**

The Network Maintenance Manual (Highways Agency 2007) [4] states in Woodlands, Trees and Hedgerows, paragraph **3.13.3**:

“Management of trees, woodlands and hedgerows must be planned to ensure these elements fulfil their objectives and functions as defined in the DMRB Volume 10, Section 0, and as set out in the appropriate landscape management plan.

Trees are an important amenity feature of the roadside soft estate and their contribution to the environment is such that they must be retained wherever it is safe to do so. Highway trees do however have the potential to pose a threat to the safety of road users, pedestrians and to adjoining property and livestock. Any external signs of decay or deterioration must be reported by the inspector for action by a qualified arboriculturist.

Trees that lie within falling distance of the highway boundary but located outside the highway boundary and not in the ownership of the Service Manager are classified as highway trees as described in Section 154, Highways Act 1980. If such trees are found to be in an unsafe condition the Service Manager has the power to order the owner to carry out such work as may be necessary to make the tree safe. If this is not carried out by the owner within 14 days, the Service Manager has the power, in accord with the provisions of Section 154 of the 1980 Highways Act, to carry out the work and recharge the cost of the work to the owner.

However, trees beyond the highway boundary may be subject to tree preservation orders (TPO). In these situations The Highways Act 1980 may not apply and planning permission may need to be sought to remove the tree; discussion with the appropriate Local Authority Tree Officer must be undertaken.

Qualified arboriculturists must be employed by the Service Provider to carry out specialist inspections and to advise on signs of ill health or damage to trees. Care must be taken to ensure the appropriate maintenance of ‘veteran trees’ (trees that are of interest biologically, aesthetically, or culturally because of their age).”

### **A.3 Case law**

Attention is drawn to the following case law:

***Shirvell v Hackwood Estates Co Ltd [1938] 2 K.B. 577***

It was held that the owner of a tree standing in a remote location where no public access could reasonably have been foreseen was not liable for the death of a person which resulted from the tree’s collapse.

***Edwards v National Coal Board [1949] All ER 743 (CA)***

This case gave rise to the concept of reasonable practicability in relation to risk reduction, as set out by the Court of Appeal:

“ ‘Reasonably practicable’ is a narrower term than ‘physically possible’ ... a computation must be made by the owner in which the quantum of risk is placed on one scale and the sacrifice involved in the measures necessary for averting the risk (whether in money, time or trouble) is placed in the other, and that, if it be shown that there is a gross disproportion between them – the risk being insignificant in relation to the sacrifice – the defendants discharge the onus on them.”

***Chapman v Barking & Dagenham LBC [1997] 2 E.G.L.R. 141; [1997] 48 E.G. 154***

It was held that a local authority was liable for serious injuries caused to a member of the public due to a falling branch, in that the authority could not show that the tree in question had been subjected to “systematic expert inspection”.

***Tomlinson v Congleton Borough Council [2003] 1 AC 46; [2004] UKHL 47***

The House of Lords ruling in this case held that natural features with inherent but obvious dangers could be left available for public access at the discretion of the users, rather than at the liability of the owners, providing that the features were no more dangerous than would normally be the case for others of their type. Thus, if harm to a user results from an activity that elevates the risk, and not the state of the premises, liability would not necessarily attach to the owner. However, the danger may not be equivalent for all types of user, e.g. fit and active adults compared to children or the disabled, with this, in turn, affecting whether liability for harm suffered might attach to the owners of the features concerned.

***Poll v Bartholomew and Bartholomew [2006] EWHC***

The preliminary judgement in this case held that tree inspections should be undertaken by suitably competent inspectors.



**Annex B (informative)**

**Government Circular 90/73**

**Inspection, maintenance and planting of roadside trees on rural roads**

This annex contains relevant text from the Government Circular 90/73 Inspection, Maintenance and Planting of Roadside Trees, for information purposes.

**Inspection and road safety**

- 7) The Secretaries of State wish to draw your Council's attention once again to the need for regular inspection of roadside trees in order that any considered to be a danger to road users can be made safe or felled. The Secretaries of State are advised that an authority or any person responsible for the safety of a tree is under a duty to have it inspected by a competent person at reasonably frequent intervals so that any indication of disease or possible disease present at the time of inspection can be noted and acted upon. The frequency of investigation will depend on age, kind, condition and circumstances of each tree; inspections should be made preferably when the trees are in leaf and symptoms of disease most apparent. There have been serious accidents over the last few years caused by trees falling on to cars; some of these accidents might have been avoided by regular inspection, proper maintenance and felling where necessary.
- 8) Accordingly the Secretaries of State request their trunk road agent authorities to pay special attention to the inspection of trees on trunk road slopes and verges. The importance of preserving both horizontal and vertical visibility must also be borne in mind during inspections and pruning work. It is particularly important to preserve vertical visibility by preventing sightlines across sag curves in the road being interrupted by overhanging trees. Where inspections reveal that important specimens or numerous trees require felling, this should be drawn to the attention of the Department of the Environment's Horticultural Advisers; any work should be carried out in accordance with the British Standard "Recommendations for Tree Work". It is suggested that local authorities should act similarly in respect of trees on their own roads.

**Annex C (informative)**  
**Government circular 52/75**  
**Inspection of highway trees**

This annex contains the text from the Government Circular 52/75 Inspection of Highway Trees verbatim, for information purposes.

- 1) General advice on the inspection and maintenance of wayside trees and hedges is given in DOE Circular No. 90/73 which, together with a Circular to be issued later relating to trees in urban areas, replaces an earlier Circular ROADS on this subject. The timing of these inspections and the detail in which they should reasonably be carried out have presented highway engineers with some problems, and the purpose of this Circular, which replaces Circular ROADS 34/74, now cancelled, is to help in resolving them.
- 2) Trees growing within the highway are a most important amenity feature, but they can also present very real danger to persons using the highway. For this reason the trees should receive adequate attention to preserve healthy growth, and they should also be examined regularly for any signs of injury or decay which could lead to their becoming a hazard.
- 3) During the course of his work the road inspector should make a note of any obviously dead, dying or dangerous trees, whether within the highway itself or within falling distance of the highway. If he finds there has been any accident or damage to a tree, that it is unstable in any way, large branches have been broken or, if in leaf, there is any sign of wilting or die-back, then the facts should be reported to the County Engineer, who will arrange for further examination by a competent person and for any follow-up action found to be necessary.
- 4) In addition the County Engineer should arrange for examination of the trees by a competent person at regular intervals, preferably when they are in full leaf, in order to make sure that they are safe and are likely to present no danger to road users before the next inspection takes place. If further action is considered necessary, this should take place urgently. The period between these inspections and the degree of examination will depend on the age and history of the trees, surgery, disease, accidents, etc. It would be helpful to the examining officer if a record could be kept of any previous damage or work done etc. on wayside trees, and brought up to date at subsequent inspections. The officer should also pay attention to trees growing on private land which are within falling distance of the highway, and examine any which are suspect. The highway authority has a right of access for this purpose, and may require the owner or occupier of land on which there is any tree which is dead, diseased, damaged or insecurely rooted to be cut or felled in order to remove the likelihood of danger (Sec. 10 Highways (Miscellaneous Provisions) Act, 1961).
- 5) Points which should particularly be noted during inspections are those related to general symptoms of debility. Thinning of the foliage and dying back of the branches is an indication of ill health in a tree. Trees in this state will need close inspection. Wounds where branches have been removed should be checked, as it is often through these that disease enters a tree. Areas where bark has peeled off should be examined, as they indicate dead wood beneath. Galls and cankerous lesions are a sign of fungal or bacterial disease and the presence of toadstools or brackets usually indicates an advanced state of fungal decay. Any moisture issuing

**WARNING. THIS IS A DRAFT AND MUST NOT BE REGARDED OR USED AS A BRITISH STANDARD. THIS DRAFT IS NOT CURRENT BEYOND 31 JULY 2008.**

from the trunk of the tree, or staining by water running down the trunk, may also indicate the presence of internal rot. When symptoms such as these have been spotted, either they should be further investigated with an auger, or the advice of a tree surgeon should be sought.

- 6) Regard should also be paid to works carried out by statutory undertakers near trees in the highway, and. consideration given to felling if it is ascertained that so many of the roots have been severed that the tree may become unstable. Similar consideration should also be given to mature trees remaining after roadworks or statutory undertakers works have removed the protection afforded by other trees, or where root systems have been damaged either by the works or by alterations to the soil level. Inspection should also cover the possibility of damage to footways, carriageways and street furniture by roots. As a rough guide root spread is usually about 1 1/3 times height. Any such damage should be reported to the County Engineer or other officer responsible

## **Bibliography**

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- [3] *Tree Damage Alert no. 123 (18.1.08)*
- [4] *Network Maintenance Manual*, Highways Agency, 2007 (updated on a rolling basis)
- [5] *Well Maintained Highways: Code of Practice for Highway Maintenance Management*, Department of Transport 2005
- [6] The Occupiers Liability Act 1957 & 1984
- [7] The Health and Safety at Work etc Act 1974
- [8] The Local Government (Miscellaneous Provisions) Act 1976
- [9] Highways Act 1980

## **Further reading**

- Principles of Tree Hazard Assessment & Management, Dr D Lonsdale, TSO 1999
- Diagnosis of Ill Health in Trees, RG Strouts & TG Winter, TSO 2<sup>nd</sup> Edition 2000
- Fungal Strategies of Wood Decay in Trees, FWMR Schwarze, J Engels, C Mattheck, Springer 2000
- Diseases of Trees and Shrubs, WA Sinclair & HH Lyon, Cornell University Press, 2<sup>nd</sup> Edition 2005