

Recommendations for Tree work

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- Association of County Councils
- Association of District Councils
- Association of Metropolitan Authorities
- Building Employers Confederation
- Construction Health and Safety Group
- Department of the Environment (Property Services Agency)
- Engineering Equipment and Materials Users' Association
- Federation of Civil Engineering Contractors
- Federation of Manufacturers of Construction Equipment and Cranes
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- Health and Safety Executive
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- National Federation of Demolition Contractors
- Royal Institute of British Architects
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- Scottish Development Department
- Trades Union Congress

The following bodies were also represented in the drafting of the standard, through subcommittees and panels:

- Association of British Insurers
- Department of the Environment
- Department of the Environment (Construction Industries Directorate)
- Forestry Commission
- Horticultural Trades Association
- House Builders Federation
- Institute of Leisure and Amenity Management
- Timber Trade Federation

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Foreword

This British Standard, which is a revision and expansion of BS 3998:1966, has been prepared under the direction of the Basic Data and Performance Criteria for Civil Engineering and Building Structures Standards Committee.

The revision was found to be necessary due to research findings, changes in techniques, equipment and chemicals; and due to the requirements for safety at work under the Health and Safety at Work etc. Act, 1974 and the Food and Environment Protection Act, 1985, Part 3: Pesticides etc.

This standard gives general recommendations for tree work, for owners of established trees, for agents of the owners, and for those responsible for planning, specifying and undertaking work on maturing trees.

Attention is drawn to BS 4043, BS 4428 and BS 5837.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 16, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This British Standard gives general recommendations for tree work.

Recommendations regarding safety precautions, sterilization of tools; preparations for wound treatment; bracing materials; techniques for applying nutrients and improving soil physical conditions; chemical treatments; and a method for protecting a large tree to be used as an anchor are given in appendices A to G.

NOTE The titles of the publications referred to in this standard are listed on the inside back cover.

2 Definitions

For the purposes of this British Standard the following definitions apply.

2.1

cambium

layer of actively dividing cells between bark and wood

2.2

cavity

hole in a tree resulting from decay or damage

2.3

crown

that part of a tree which is composed of the branches and foliage

2.4

epicormic shoot

growth from dormant or adventitious buds on the stem or main branches

NOTE 1 The term epicormic shoot should not be confused with a sucker that arises from a root or root stock.

NOTE 2 Water sprout and water shoot are deprecated terms.

2.5

heartwood

central core of mature and hardened timber

2.6

sapwood

softer and more recently formed wood between the bark and heartwood

2.7

slime-flux

watery, often fermenting, sometimes foul-smelling, liquid issuing from a stem or branch, as a result of infection or injury

2.8

sound wood

wood that is not infected, decayed or damaged

3 General

3.1 Consideration of trees individually and collectively

Trees should be considered both individually and collectively. Work to be specified should be determined in relation to the species, age, shape, size, character, condition and situation of the tree(s) concerned.

3.2 Avoidance of damage

All operations should be carefully planned and carried out so as to avoid damage to the tree being treated or to neighbouring trees. Care should be taken to avoid damage to nearby property and services below, on or above the ground, by equipment, materials, spillage of fuels and chemicals, falling branches or trees.

3.3 Completion

All surgery on trees, whether carried out for reasons of safety, health, space requirements or for aesthetic reasons, should be completed so as to leave them well balanced and of pleasing appearance.

4 Inspection of trees

NOTE In most cases an assessment of work needed will be made by an observer at ground level during a *general inspection*. Foreknowledge of hidden defects, especially in the crown of a tree, cannot be expected.

If abnormal features indicating ill health or the presence of potentially weak structures are found, a *detailed inspection*, which may necessitate climbing the tree, should be undertaken. Significant defects detected during a *detailed inspection* should be recorded and reported to the owner or agent.

5 Legislative controls

Enquiries should be made to ascertain whether any legislative controls apply to the tree(s), e.g. does a tree form part of a defined Conservation Area or is it subject to a Tree Preservation Order? If this is the case appropriate notice should be given or permission should be obtained before work is started.

6 Tree specialists

Only specialists of proven experience, and who are properly equipped with the appropriate working and safety equipment, should be engaged upon tree work. Operators should be skilled in tree work and should have been trained in safe techniques.

NOTE Consideration should be given to the need for adequate public liability and employer's liability insurance (see also clause 7).

7 Safety

7.1 General

Tree work can be dangerous both for those engaged in it and for people and property in the vicinity of the work. All work should be done taking account of the Health and Safety at Work etc. Act, 1974 (see also appendix A). The public and surrounding property should be safeguarded at all times. Tree work sites should be left safe at the end of each day's work.

7.2 Precautions

Safety precautions should be taken as recommended in appendix A.

NOTE 1 If chemicals are to be used attention is drawn to the requirements of the Food and Environmental Protection Act, 1985, Part 3: Pesticides etc. and the Control of Pesticides Regulations (SI 1510) 1986.

NOTE 2 Sources of specific safety information are given in appendix A.

8 Season

Most tree work operations can be carried out at any time of year. At certain times of the year, however, a few species respond to wounding by production of a copious exudation of watery liquid, resin or gum ("bleeding"); except on *Prunus* species and resinous conifers, work during these periods should be avoided if possible.

NOTE The gum from *Prunus* species, produced in summer, affords protection against certain diseases, e.g. silver-leaf and bacterial canker.

9 Equipment

9.1 General

Tools and equipment should be serviceable and appropriate for the work. Cutting tools should be sharp.

9.2 Avoiding transmission of diseases on tools

9.2.1 Extreme caution should be exercised to prevent the introduction of foreign diseases into this country on tools that have been previously used abroad.

NOTE Within this country, fireblight (*Erwinia amylovora*) and watermark disease (*Erwinia Salicis*) are the diseases most likely to be transmitted on tools.

9.2.2 Work on infected trees should be carried out with hand tools. After use these should be sterilized, following the procedures given in appendix B, before being used on other susceptible trees.

10 Instructions prior to carrying out tree work

10.1 General

Persons who will be carrying out tree work should be given a clear schedule of the work to be done, advice concerning access to the site, disposal of arisings (see clause 22) and any limitations upon working.

10.2 Significant defects found during the course of scheduled work

Instructions should be given that any significant defects in a tree, found during the course of scheduled work, should be reported to the owner or agent, with whom any subsequent modification to the scheduled work should be agreed.

11 Treatment of wounds

11.1 General

Wounds on trees become colonized by micro-organisms, some of which are harmless while others are able to cause serious damage. Persons engaged in tree work should be aware of the two main groups of harmful organisms that may be present:

- a) fresh wound parasites; and
- b) wood-decaying organisms.

11.2 Fresh wound parasites

Treatment should be carried out in all cases where there is a high risk of infection.

NOTE 1 Fresh wound parasites, which may be fungal or bacterial, cause cankers, decay and other diseases such as silver-leaf. The parasites can be prevented from attacking trees via wounds if the wounds are treated promptly.

NOTE 2 The risk of damage varies greatly according to tree species and wound size. The high risk category includes most commercial fruit tree genera, and other tree species where a wound is large in relation to the stem or branch diameter or is very close to other wounds on the same tree.

NOTE 3 Further information concerning treatments against fresh wound parasites is given in C.1.

11.3 Wood-decaying organisms

11.3.1 When pruning cannot be avoided, the risk of serious decay development can be reduced if pruning cuts are made as recommended in clause 13.

NOTE Decay in a tree can seriously reduce the strength of the affected part (see clause 17). Wood decay in standing trees, which may occur in roots, stems or branches, is caused almost entirely by fungi. Underground, fungi often penetrate and kill live bark of roots, but above ground such fungi usually invade the tree through pruning wounds and other large wounds. Little can be done to prevent the development of most root-infecting and/or wood-rotting fungi.

11.3.2 Except as recommended in 11.2, heartwood exposed by pruning and other wounds should be left untreated so that the surface dries out. A bitumastic or latex based paint should be applied to the outer edge of a wound, to prevent drying and dieback of the cambium.

11.3.3 Treatment of the whole wound should be regarded as cosmetic only: a thin layer of a bitumastic or latex based paint or a household emulsion paint can be applied (see also C.2).

NOTE Research has shown that currently available proprietary wound paints do not prevent decay and their waterproofing qualities may even provide conditions in the wound favourable for the growth of wood-rotting fungi.

12 Cleaning out

12.1 General

Dead, dying or diseased wood, stumps of broken branches, unwanted epicormic shoots, climbing plants, e.g. ivy, and rubbish accumulated in branch forks should be removed. Other objects such as wires, clamps or boards should also be removed when this can be done without inflicting undue damage on the tree concerned.

12.2 Ivy

Ivy may have to be removed from trees so that they can be fully inspected, as ivy can hide decaying or weak structures.

NOTE Ivy is the commonest climbing plant found on mature trees and does not generally cause any physical damage to the support tree. When however ivy grows into the crown of a tree it will provide resistance to wind and fracture of the tree can occur.

12.3 Other climbing plants

Other climbing plants such as spiralling shoots of honey-suckle which constrict the stem, or matted shoots of clematis which blanket the crown, should be removed from young trees.

13 Pruning

NOTE 1 Pruning trees when young (formative pruning) may reduce the need for major pruning in middle age and in maturity.

NOTE 2 The need to prune middle aged and mature trees is frequently determined by their position in the landscape. There are occasions when changing land use (e.g. building or highway development) may make extensive pruning necessary.

NOTE 3 It is worth considering the removal of trees that need frequent major pruning and their replacement with a more appropriate species.

13.1 Cuts

13.1.1 Pruning cuts should, wherever possible, be made at a fork or at the main stem to avoid stumps, which can die back, and dense regrowth of shoots. Removal of large branches should only be carried out when it is unavoidable, and wounds from such work should be kept as small as possible.

13.1.2 Cuts into live wood should be avoided when removing dead branches and stubs. When a branch collar is present the final cut (Figure 1) should be just outside it. When there is no collar the angle of cut should be the mirror image of the branch bark ridge.

13.1.3 Pruning with either a handsaw or a chainsaw should be done in stages so as to avoid splitting of the tissues and irreparable damage to the tree (see also 13.3).

NOTE The construction of a chainsaw may make accurate positioning of the cut difficult, especially on small diameter branches, and the use of a handsaw is frequently preferable.

13.2 Formative pruning

13.2.1 Formative pruning should aim to produce a tree which in maturity will be free from major physical weaknesses. Unwanted secondary leading shoots and potentially weak forks which could fail in adverse weather conditions, e.g. strong wind or snow, should be removed.

NOTE Failure to remove such shoots may necessitate premature felling to safeguard people and property.

13.2.2 When growth within a tree crown results in crossing branches that may rub together causing loss of strength or possible fracture in adverse weather, one of the branches should be removed.

13.3 Removal of heavy branches

Heavy branches should be removed in sections, and when necessary should be lowered with ropes to avoid damage to the tree or its surroundings.

13.4 Crown reduction and/or reshaping

NOTE Some trees can be reduced in height and/or spread while preserving a natural tree shape (see Figure 2) by crown reduction and/or reshaping.

13.4.1 Crown reduction and/or reshaping should be carried out by cutting back to a side bud or branch to retain a flowing branch line without leaving stumps. All cuts should be made just outside the line of the branch bark ridge and branch collar (see Figure 1) of the retained branch.

13.4.2 Very substantial crown reductions should, ideally, not be made during a single growing season since severe loss of leaf area and multiple wounding may impair a tree's defences against diseases and decay.

13.4.3 Reshaping should be a "once only" operation to make a tree safe or to bring it to a desirable condition or shape.

13.4.4 With a few species it may be appropriate to reshape a crown by careful pruning. This technique has a place in urban area management programmes for existing mature trees which have previously been pollarded.