



**TREE CONDITION SURVEY
&
RECOMMENDATIONS
For
Piperdam, by Dundee**

For and on behalf of: Hiddleston and
Feist Architects

October 2019

requested by: Hiddleston & Feist
Architects Prepared by:
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TREE CONDITION SURVEY AND MANAGEMENT

Trees at: Piperdam Dundee

1. INTRODUCTION

I have been instructed to carry out a condition survey of the trees positioned along the road front of Piperdam. This report has been produced to inform future management and to identify trees which pose a potential hazard. Also included are recommendations and remedial action in relation to such trees in order to reduce or eliminate the potential to cause harm to the adjacent carriageway.

I have surveyed a total of 55 individual trees. All trees are in a linear row in front of a conifer plantation on the east of the access road to the Piperdam complex.

The report places emphasis on trees with recognised defects, their rooting environment, and those which, due to past management, pose a significant potential hazard. It also seeks to address the need for preventative action and ongoing management to improve the condition of the trees in general. The implications for the trees if the conifer plantation were removed will also be considered.

I strongly recommend that tree management is addressed in a systematic manner future, which includes regular inspections of trees – most frequent in the case of trees identified here as presenting an appreciable hazard due to their position in relation to the carriageway.

Background

This assessment has been carried out at the request of Hiddleston & Feist Architects in relation to the site at Piperdam. I have been requested to conduct an arboricultural survey of the trees on the roadside area of the site. The tree cover is dominated by a line of maturing Oak and some Sycamore and several other minor species.

A total of 55 trees have been surveyed and assessed according to BS 5837:2012 '*Trees in relation to construction – Recommendations*', which provides an objective method to identify the quality and value of the existing tree population. All arboricultural information is presented at appendix 1.

The trees are of a similar age and species, and in variable condition. Most of the Oak appear to have been planted around the same time, approximately 100 years ago. The Sycamore are self-seeded and younger. The trees are assessed as semi-mature or early-mature, depending on species and development. The Oaks are frequently one sided due to the plantation to the rear and have significant dead wood on the south side. The plantation, directly south and to the rear of the Oak, is a closely spaced plantation of Spruce and Larch, and no thinning has been undertaken resulting in drawn slender trees with little or no ground cover or understorey.

Almost 50% of the trees are categorised A or B under BS 5837: 2012. Just under half of the trees are categorised as C and 7% as U.

Five trees have been identified for removal in the current context, due to poor quality and in some instances a risk to public safety. Future management should include the removal of dead wood from most of the Oak crowns and from the south side of the main stem.

The location of all surveyed trees is provided on the Tree survey and constraints plan (plan 1) which provides the above and below ground tree constraints represented by crown spreads and root protection areas. This information should be used to help inform any future development of the site. All development should be set back from mature trees, in the interests of public safety. The good quality A and B category trees provide the main constraint to development.

Management of the trees is required to reduce the hazard to an acceptable level with the aim of retention, as appropriate. The trees are an important landscape feature and contribute greatly to biodiversity. I understand that the adjacent conifer plantation is to be removed and this will also have a bearing on future management.

Constraints: The trees are not located within a Conservation Area. I am not aware of any Tree preservation orders; however, The Local Authority should be contacted to check this and to seek authorisation for any remedial tree work recommended in this report.

2. SCOPE AND LIMITATIONS

The findings and recommendations contained within this report are valid for a period of twelve months from the date of survey (i.e. October 2020). Trees are living organisms subject to change and it is strongly recommended that they are inspected on a regular basis for reasons of safety.

The recommendations given relate to the site as it exists at present, and to the current level and pattern of usage. The degree of risk and hazard may change if the site is altered, and as such will require re-inspection and appraisal.

Whilst every effort has been made to detect defects within the trees inspected, no guarantee can be given to the absolute safety or otherwise of any individual tree. Extreme climatic conditions can cause damage to even apparently healthy trees.

This report has been prepared for the sole use of Hiddleston & Feist Architects.

3. SURVEY METHODOLOGY

I inspected the trees on 12th and 13th September, by visual inspection from the ground. Tree inspection is based on ground level inspection of external features only - described as the 'Visual Tree Assessment' method per Mattheck and Breloer – stage 1 - (The Body Language of Trees, DoE booklet Research for Amenity Trees No. 4, 1994). Where trees require to be climbed to aid inspection, this has been identified.

All individual trees surveyed have been tagged using numbered aluminium discs. Numbers run from 703 - 757. The following information has been recorded for each tree in the Tree Survey Schedule, included as appendix 1:-

- Tree number
- Age class: Young; Semi Mature; Early Mature; Mature; and Late Mature.
- Physiological condition: Good, Fair, Poor as assessed from observation at ground level.
- Comments: to include structural defects: visually recognised from observation at ground level.
- Hazard Potential: High, Moderate (Med), Low, or Very Low, assessed from the combination of the following factors: size of defective part; potential to fail; and target: roads, residential buildings, parked cars...associated with the probability of impact and frequency of use.
- Recommendations: Remedial work recommended, reducing or alleviating the potential hazard posed by the location and condition of the individual tree.
- Timing: 1 (most urgent) – M (least urgent); used to prioritise works, based on the degree of urgency associated with the potential danger or nuisance to be addressed, and in some cases the common sense need to carry out preventative or improvement works timeously.
 - Priority 1: Remedial work requiring urgent attention. Normally trees with a high hazard potential i.e. those with numerous or severe defects and a high target. Such work should be started as soon as possible and carried out within six months.
 - Priority 2: Normally trees with a moderate hazard potential or high nuisance value (such as trees overgrowing public areas). Such work should ideally be completed within twelve months.
 - Priority 3: Generally, trees with a low hazard potential i.e. moderate defects and a moderate to low target. Such work should be completed within a reasonable timescale, probably 1 year to 3 years but this may depend on the budget available and type of work prescribed.

- Priority M: Here remedial work is recommended in order to improve the future potential of the individual tree and/or surrounding trees and landscape. In some cases, the potential hazard will also be reduced or alleviated. Work to be carried out in the next 2-5 years or possibly in conjunction with work of a higher priority to aid efficiency. This also includes trees to be monitored due to condition, size, location or a combination of these.

4. SITE

The site is located about 12 miles north west of Dundee on the A923 Coupar Angus road. It lies to the north of Piperdam village and is adjacent to the carriageway, it is positioned to the east of the access road to Piperdam.

The site consists of a row of trees, mostly broadleaves, with a conifer plantation to the rear. The broadleaves comprise primarily Oak, with some Sycamore, Silver Birch and Alder. The closely spaced conifer plantation, younger in age than the broadleaves, is planted very close to the Oaks, it comprises mainly Spruce and Larch. There is a drainage ditch immediately to north of the broadleaved trees running for almost the full length of the group, there are also several drainage ditches within the plantation to the south of some of the trees. Some of the trees are located close to culverts, spaced intermittently along the ditch.

The topography of the site is generally flat and even

5. TREE OBSERVATIONS

General

The tree cover is dominated by a row of mature Oak and Sycamore (see plate 1). A total of 55 individual trees have been recorded. The trees have been tagged and tree numbers run as follows: - T703 – T757



Plate 1 Row of Oak and Sycamore

A full schedule of the trees is given at appendix 1 and the tree locations are provided on plan at appendix 2.

Species

The survey population includes 7 species. The most commonly occurring species are as follows:-

Species	No trees	Percentage
Oak	36	65
Sycamore	12	21
Scots Pine	2	4
Ash	2	4
Silver Birch	1	2
Spruce	2	4
Totals	55	100

Table 1. Breakdown of species

Fifty-five trees have been surveyed, with Oak being the dominant species, accounting for around 65% of the trees surveyed. With Sycamore, this accounts for over 85% of the tree cover. The remaining 14% comprises 2 Scots Pine, 2 Ash, 1 Silver Birch and 2 Spruce.

Age structure

The Oak trees appear to have been planted around the same time and are mainly assessed as semi-mature or early-mature depending on species and development (see table 2 below):-

The break-down of age groups, as recorded, is as follows: -

Age class	Young	Semi-mature	Early-mature	Mature	Late-mature
Totals	0	16	37	0	0
Percentage (%)	0	29%	67%	0	0

Table 2: break down of individual trees

Around 29% of the trees have been assessed as semi-mature and 67% of the trees as early-mature in age. There were no young, mature or late mature trees recorded.

Tree condition: structural and physiological issues

General

Most of the Oaks are structurally in reasonable condition with nearly half of the overall tree population assessed category A & B see table 3. Around 45% of the trees are downgraded to category C, due mainly to lack of management intervention, with 7% graded as U (proposed for removal).

Tree Quality Assessment Category					
	A	B	C	U	Totals
Totals	10	16	25	4	55
Percentage	18%	29%	45%	7%	100%

Table 3 BS 5837: 2012 tree quality overview

There are 10 'A' category trees including 9 Oak, T713, T718, T726, T733, T737, T740, T741, T750, T751 and 1 Sycamore T703 (a prominent tree of god form, located at the eastern end of the row). All of which have long term potential.

The 13 'B' category trees are mainly Oaks, which are downgraded from 'A' category due to mis-shaped and suppressed crowns. One Sycamore and 1 Sitka Spruce are also recorded as B category.

Around 45% of the survey population is assessed category C and of low quality and short-term potential only. These include both Oak and Sycamore; they are of poor quality, form and low vigour and are generally suppressed trees. These trees do not provide a significant constraint to future development.

Four U category trees are identified, including 2 Oak, 1 Sycamore and 1 Ash. These trees are of low quality and should either be removed in the current context or in the short term as part of sound arboricultural management

Tree location and rooting environment

All the surveyed trees run parallel with the carriageway, and between the trees and the road there is a drainage ditch. The ditch, on the north side of the trees has a depth of nearly 2m which is likely to restrict the rooting zone of the trees. Root systems can extend in excess of the canopy spread and are usually found in the top 600mm of soil. This implies that the root structure of the trees is confined to a much smaller area than normally expected. Although there will be some rooting on the north side, it is likely that the roots are mostly present on the other sides of the tree. No significant evidence is observed to suggest that the trees are unstable; the ditch appears of considerable age and it is likely that roots have adapted to this environment. The main indicators of restricted rooting are likely to be diameter and crown growth and basal flare.

However, where the ditch is present on both sides, to north and south, it will be necessary to monitor these trees closely, especially if the plantation behind the Oaks is felled. Where ditches on both north and side occurs effects trees T739 – T742



Plate 2: drainage ditch to north of the trees

Trunks/Crowns

The plantation behind the Oaks and Sycamores encroaches and has caused considerable dieback, within the crowns and many lower branches are either dead or dying. The proximity of the conifers has excluded light and restricted growth to the south resulting in mis-shaped crowns and many exhibit significant levels of deadwood.

The result from restricted light levels is a generally a misshapen crown with the trees reaching for the light to the north, west and east directions. The Oaks require management given the high target rating of the carriageway, through the removal of dead wood from the crowns and main stem. Reduced crown development at the southern side of the tree may have an impact on root development on this side of the tree also.

Tree Management

Given removal of the conifer area to the rear of the survey trees, the stability of the remaining row of Oak and Sycamore will require ongoing consideration. At present the trees appear stable and in reasonable condition, and with management there is no reason that the Oaks, as a long lived species should not live for a considerable number of years.

For the past thirty or so years the Oak and Sycamore have become increasingly sheltered by the conifer plantation, which, in recent times, has developed to equal the height of these broadleaved trees. The Oak are now afforded shelter from the prevailing south westerly winds and have in recent years become accustomed to this protection. As trees grow, they acclimatise and develop over time to resist wind loading and strengthen themselves to its effects. In my opinion, however, most of the row of broadleaved trees are windfirm, due to previous exposure prior to the development of the conifer plantation. Removal of the conifer plantation will, in my opinion, mainly impact those trees with poor root development as characterised by drawn, slender stems, strongly asymmetric crowns and poor basal flare. Trees restricted between ditches to the north and south are also likely to be most at risk.

The options for management of potentially unstable trees include crown reduction or removal. The maintenance recommended as outlined above should be undertaken prior or immediately after the felling of the plantation, but within the timescale advised. Following this, the Oak and larger Sycamore should be monitored for any signs of instability.

6. RESULTS AND REMEDIAL ACTION

The results of my inspection are as follows: Table 4, below, gives a summary of the recommended tree removals under priority 1 & 2 (from the tree schedule, appendix 2).

Table 4 prioritised remedial tree removals under timings 1 and 2)

Tree No.	Age class	Species	Remedial Action	Targets
Priority 1 (as soon as possible)				
T708	EM	Oak	Remove dead wood hanging over carriageway	Carriageway
T739	EM	Oak	Remove hanging branch over carriageway (minor branch)	Carriageway
Priority 2 (within 12 months)				
T705	EM	Oak	Fell tree	Carriageway
T706	EM	Oak	Crown clean, remove dead branches	Carriageway
T707	EM	Oak	Fell tree	carriageway
T708	EM	Oak	Crown clean, remove dead branches	Carriageway
T710	EM	Oak	Crown clean, remove dead branches	Carriageway
T712	EM	Oak	Fell tree	Carriageway
T714	EM	Oak	Crown clean, remove dead branches	Carriageway
T716	EM	Oak	Crown clean, remove dead branches	Carriageway
T717	EM	Oak	Consider removal of suppressed tree	Carriageway
T718	EM	Oak	Crown clean, remove dead branches	Carriageway
T720	EM	Sycamore	Fell tree	Carriageway
T721	EM	Oak	Crown reduce and crown clean, remove dead branches	Carriageway
T722	EM	Oak	Crown Clean, remove dead branches	Carriageway
T723	EM	Oak	Crown Clean, remove dead branches	Carriageway
T726	EM	Oak	Crown clean, remove dead branches	Carriageway
T728	EM	Oak	Consider removing tree	Carriageway
T729	EM	Oak	Crown Clean, remove dead branches	Carriageway
T731	EM	Oak	Crown Clean, remove dead branches	Carriageway
T733 - T 744	EM	Oak	Crown Clean, remove dead branches	Carriageway
T746	EM	Oak	Crown Clean, remove dead branches & Crown reduction; remove hanging branch at 8m	Carriageway

T747	EM	Oak	Crown Clean, remove dead branches & Crown reduction	Carriageway
T748	EM	Oak	Crown Clean, remove dead branches	Carriageway
T749	EM	Ash	Fell tree	Carriageway
T750	EM	Oak	Crown Clean, remove dead branches	Carriageway
T751	EM	Oak	Crown Clean, remove dead branches	Carriageway
T752	EM	Oak	Crown Clean, remove dead branches	Carriageway
T754	EM	Ash	Fell tree	Carriageway
T755	EM	Oak	Fell tree	Carriageway
T756	EM	Oak	Crown Clean, remove dead branches	Carriageway
T757	EM	Oak	Reduce and reshape crown by 2m &, remove dead branches	Carriageway

A full break down of remedial work is given at appendix 1. This work is intended as part of sound arboricultural management and in order to deal with potentially hazardous trees on site. The work should be undertaken prior to the removal of the plantation if that is different from the recommended timescales.

The approximate locations of individual trees surveyed is indicated on map 1, appendix 3.

Urgent remedial works – priority 1

T708 – Remove dead wood hanging over carriageway

T739 – Remove hanging branch over carriageway (minor branch)

Future tree inspections

Further inspections should be carried out at regular intervals - every eighteen months or so- with a little and often approach adopted rather than repeating full detailed inspections of all the trees at longer intervals. These inspections should pick up on new hazards and developing problems in known trees.

The benefit of this approach is that hazardous trees are identified early and trees which give cause for concern can be monitored over a period of time, and, where suitable, action delayed until required.

Trees should be inspected at different times of year: many important fungi are only present at certain periods of the year; branches of deciduous trees are most easily

seen during the winter months; delayed flushing during the spring, and early leaf drop during the autumn can also be useful signs of deteriorating condition.

9. RECOMMENDATIONS

1. It is advisable to prepare for recommended works: priority 1 as soon as possible. This work should be carried within 12 months, ideally during the winter.
2. Works recommended under priority 2 and M (management) should be carried out within the next 12 months.
3. All tree works should be carried out by suitably experienced and skilled operators in line with BS 3998: 2010 '*Tree Work - recommendations*'
4. **Statutory wildlife obligations:** The Wildlife and Countryside Act 1981 as amended by the Nature Conservation (Scotland) Act 2004 provide statutory protection to birds, bats and other species that inhabit trees. All tree work operations are covered by these provisions. Prior to undertaking any tree work, the Contractor should make a visual inspection of the tree for Bat roosts. If Bats and/or roosts are identified, Scottish Natural Heritage (SNH) should be contacted and an agreement made with regard to measures to be undertaken to protect Bats before undertaking any work which might constitute an offence. Where possible, major tree works should be undertaken during winter months to avoid bird nesting and bat roosting.
5. I strongly recommend that trees within the property are inspected on a regular basis for health and safety reasons and future management, as indicated in this report.
6. **The Local Authority** should be consulted prior to carrying out any of the recommended remedial arboricultural work.

10. CONCLUSIONS

1. Completing the remedial work specified in this report will significantly reduce the potential hazard to users of the adjacent road resulting from trees at Piperdam.
2. The completion of management/preventative works specified as less urgent, prioritised under timings 2 should significantly reduce the potential hazard of the trees.

[REDACTED]

Bsc (Hons) For, MICFor, CEnv

Appendix 1: Tree survey schedule

Appendix 2 : Map 1: tree locations

Appendix 3: Pruning work

BS 3998 : 1989

12.3 Other climbing plants

Other climbing plants such as spiralling shoots of honeysuckle 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.

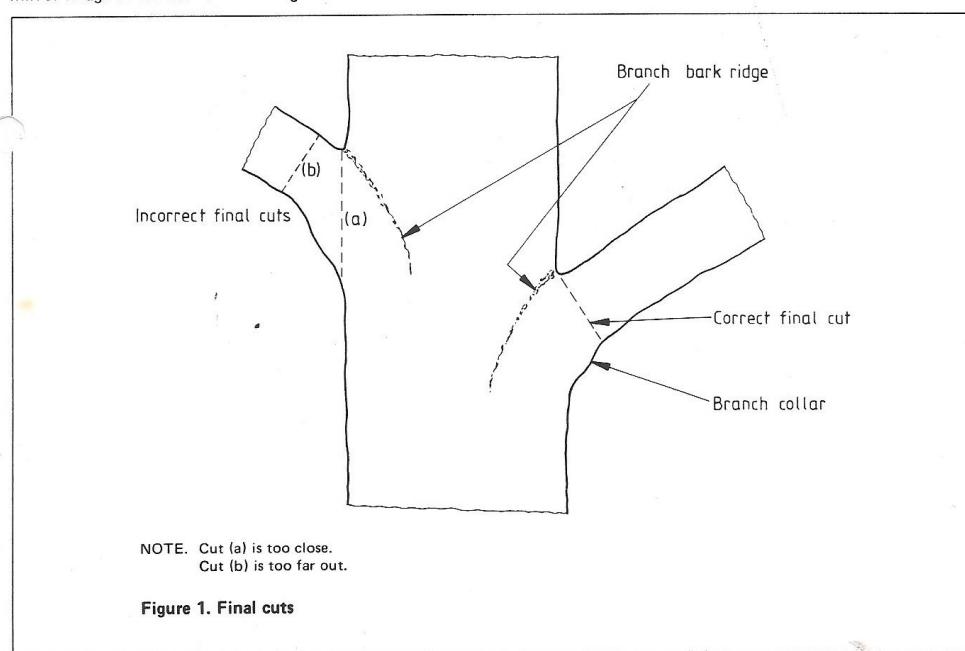
13.2.2 When growth within a tree crown results in crossing branches that may rub together causing loss of strength or possible fracture in adverse weather, one of the branches should be removed.

13.3 Removal of heavy branches

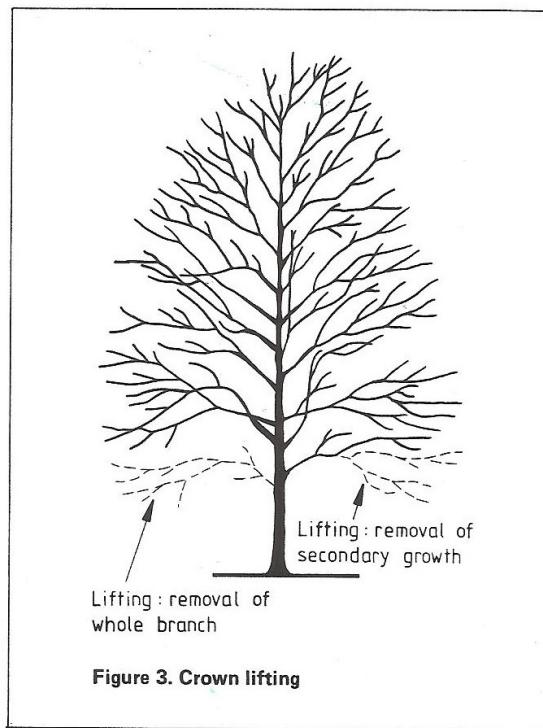
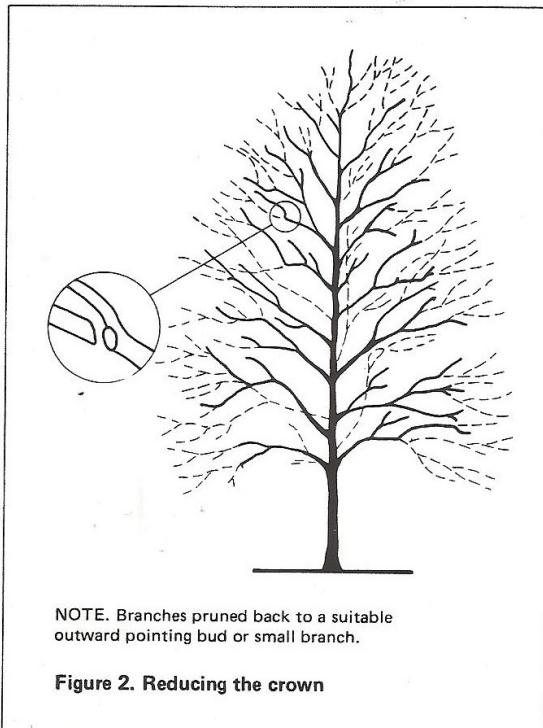
Heavy branches should be removed in sections, and when necessary should be lowered with ropes to avoid damage to the tree or its surroundings.

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.



Appendix 3 continued



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.

13.4.5 Regular crown reduction may be harmful and may make a tree unsafe, in the same way that regular pollarding can render a tree unsafe (see 13.7). It is worth considering the removal and replacement of such a tree with a more appropriate species.

13.5 Crown lifting

Crown lifting, which involves the removal of the lower branches to a given height above ground level (see figure 3) should be achieved either by the removal of whole branches, or by the removal of only those parts which extend below the desired clear height.

13.6 Crown thinning

13.6.1 Crown thinning, which involves the removal of a proportion of secondary and small, live branch growth from throughout the crown to produce an even density of foliage around a well spaced and balanced branch structure should usually be confined to broadleaf species. Crossing, weak, duplicated, dead and damaged branches should be removed.

13.6.2 The percentage of crown to be removed should be stated, but the leaf area removed should not normally exceed 30 % of the original coverage.

NOTE. Crown thinning can stimulate many tree species into producing epicormic shoots and a dense crown will frequently form again.

13.7 Pollarding

NOTE. Topping and lopping are synonyms for pollarding.

Pollarding, which in some circumstances has been a traditional form of management, should not be used on trees that have not previously been pollarded, as the large wounds created initiate serious decay in mature and maturing trees.

NOTE. Very heavy pruning may kill some species (e.g. beech) while others will be stimulated to produce a proliferation of very dense regrowth of shoots from around each wound. Such shoots grow vigorously and have weak attachments to the tree making trees potentially dangerous unless recutting is done frequently. This risk is smaller for very young trees, but it is better to plant an appropriate species for the site rather than to restrict the size of an unsuitably wide spreading or tall growing species.