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Arboricultural Constraints Report

Relating to Trees at 14a Redington Road, Hampstead, London

Client: Jessica Sokel
C/O Michael Hardiman & Associates
Powage House
Church Street
Apsley Guise
Milton Keynes
MK17 8HQ

Ref: 846.CS.Hampstead.Sokel

Date of Inspection: 17th October 2005

Prepared by: Andrew Belson Dip. Arb. (RFS) Tech. Cert. Arbor. A

Appendix
A

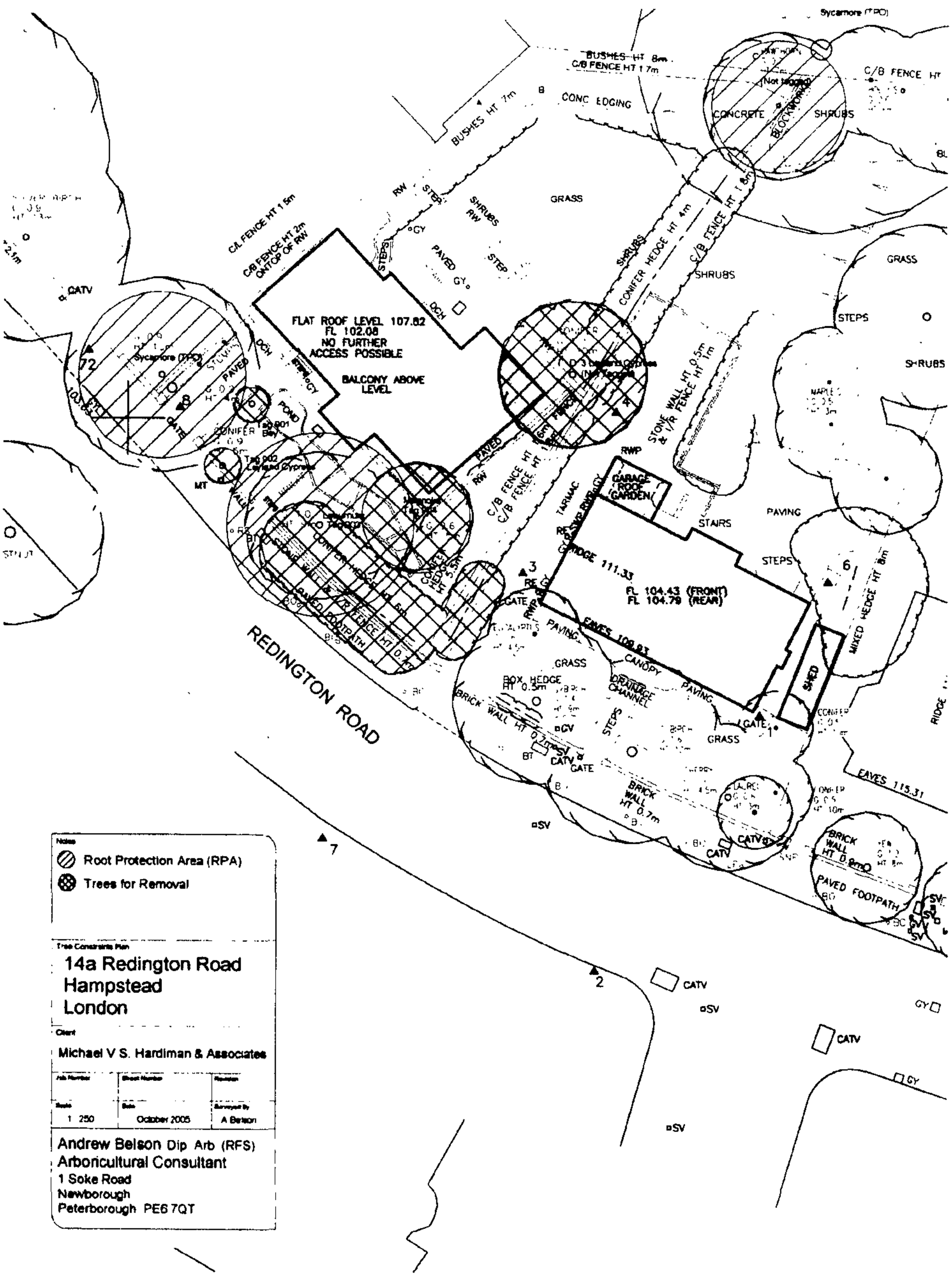
Tree Survey

Key to Survey

Tag Number	Relates to aluminium tags
Height	Measured with clinometer where considered critical or taken from topographical survey
Maximum crown spread (radial)	Measured in direction of greatest constraints; usually into site.
Age Class	Young = Tree in first 1/3 of expected life M/A = Middle aged; tree in 1/3 – 2/3 of expected life M = Mature Tree O/M = Over mature or in decline
Vigour:	Normal = expected vigour for species Low = lower than expected for species
Main Stem Diameter	Measured at 1.5 metres above ground of just above root flare for multi-stemmed trees (ARF).
Amenity Value	High = Very Visible (from a public place) Mod = Moderately Visible (from a public place) Low = Glimpsed views (from a public place) None = Cannot be seen
Condition	Good = No visible defects seen Reasonable = Some defects seen but none that contribute significantly to the overall health and safety of the tree Poor = Defects or health issues that contribute significantly to the overall health and safety of the tree

Appendix
B

Plans and Charts



Notes

Root Protection Area (RPA)

Trees for Removal

Tree Constraints Plan

14a Redington Road Hampstead London

Client

Michael V S. Hardiman & Associates

Job Number	Sheet Number	Revision
Scale: 1 250	Date: October 2005	Surveyed By: A Belson

Andrew Belson Dip Arb (RFS)
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Tag No	Species	Height (m)	Main stem diameter (mm)	Maximum Crown Spread	Age class	Condition	Amenity Value	Recommendations	Estimated Remaining Contribution	Retention category	RPA (radius)
B	Lawson's Cypress *(Chamaecyparis lawsoniana cv.)*	6	150 (ARF)	1.5	Y	Good.	L	Retain	40+	B1	1.5m
C	Hawthorn *(Crataegus monogyna)*	8	300 (estimate)	4.0	M/M	Good.	M	Retain	40+	B1	3.6m
D	Leyland Cypress (group of 3)	8	320 (each)	3.0	M/M	Reasonable. Previously reduced to present height. The trees are very close to the property.	M	Fell and replace with a less vigorous tree that is more in keeping with the conservation values of the area	40+	B2	/
E	TPO Sycamore *(Acer pseudoplatanus)* situated on neighbouring property to west of site	10	280	5.0	M/M	Good.	H	Protect from development activity.	40+	B1.	3.3m

The root systems of the trees were not inspected

Tag No	Species	Height (m)	Main stem diameter (mm)	Maximum Crown Spread	Age class	Condition	Amenity Value	Recommendations	Estimated Remaining Contribution	Retention category	RPA (radius)
901	Bay Laurel *(Laurus nobilis)*	4.0	250	1.2	M/M	Reasonable. Normal vigour Much of the root system is under the block-paved drive. A deep excavation for the adjacent pond has left little root zone to the east of the tree. Past management appears to have been regular trimming.	M	Would be difficult to retain in a development setting so best to plan to fell and replace.	40+	B1	3.0m
902	Leyland Cypress *(x Cupressocyparis leylandii)*	5.2	340	2.0	Y	Reasonable. Normal vigour. Recently reduced to present height.	H	Fell and replace with a less vigorous tree that is more in keeping with the conservation values of the area.	40+	B2	/
903	Laburnum *(Laburnum anagroides cv.)*	9.0	420	4.0	M	Poor. Low vigour. Main stem has developed with a lean of 10^0 north east. Bark symptoms suggest the tree may be subsiding.	M	Could be retained but the tree has a relatively short remaining contribution.	10 - 20 years	C2	5.0
904	Magnolia *(Magnolia macrophylla)*	5.0	320	3.0	O/M	Poor. Low vigour. Bark death and basal decay on lower main stem.	L	Fell and replace	0-10	R	/
A	Prunus sp.	7.5	100	1.5	Y	Good.	M	Could be retained.	40+ years	B2	1.2

Appendix

C

Reference Material

NHBC Chapter 4.2 'Building near Trees' 1984

Tree Roots and Buildings (Cutler and Richardson) 1997

BS5837 'Trees in Relation to Construction' 2005

BS3998 'Recommendations for Treework' 1989

NJUG 10 Guidelines (National Joint Utilities Group) 1995

Arboricultural Advisory and Information Service APN 5 'Shaded by Trees? 1999

Arboricultural Advisory and Information Service 'Tree Roots and Foundations' 1998

Arboricultural Advisory and Information Service 'Tree Root Systems' 1995

The Town and Country Planning Act 1990, The Town and Country Planning (Trees) Regulations 1999

Diagnosis of Ill Health in Trees (Strouts and Winter) 1994

Principals of Tree Hazard Assessment and Management (D Lonsdale) 1999

The Health and Safety at Work Act 1974

Section 1

Instructions

1.1 This report was commissioned by Michael Hardiman during a telephone conversation on 13th October 2005; with instructions to carry out a tree survey relating to a layout proposal for the site.

1.2 The objectives of this report are as follows:

- To inspect trees affected by the development, above ground, in respect of the recommendations in BS5837: 2005 'Trees in Relation to Construction'
- To provide information to assist in the layout of the site.

Section 2

Report Limitations

2.1 As trees and shrubs are living organisms whose health and condition can change rapidly, conclusions and recommendations are only valid for one year. The health, condition and safety of trees should be checked regularly, preferably annually.

2.2 I did not examine the soil or take samples for analysis, as this is a preliminary report. Should soil samples be required, this will be highlighted in the report.

2.3 The trees were examined from ground level, as this is a preliminary report. Should further, more detailed information be required, this will be highlighted in the report.

Section
3

Tree Protection

3.1 Where Local Planning Authorities can assess trees as beneficial to the wider community in terms of their amenity value, they may be protected by a TPO. There is a Tree Preservation Order that covers a tree that no longer exists and further TPOs cover trees on adjoining land.

3.2 Work may be permitted on a tree protected by a TPO after an application has been submitted to the LPA and written permission granted. Once an application has been made, a representative of the LPA will inspect the trees, notices will be posted so that affected parties can object or make representations and a decision will be made within an eight-week period.

3.3 If a decision has not been made within an eight-week period, the person making the application can apply to the DTLR for Non-Determination. If the LPA refuses the application, the appellant still has the right to appeal.

3.4 In certain areas classified as Conservation Areas, all trees with a stem diameter of 75mm (measured at 1.5m above ground) are protected by Conservation Area legislation. This site is situated within the Hampstead Heath Conservation Area.

3.5 The LPA must be given notice of any work intended so they can visit the site and then either protect the tree(s) with a TPO or allow the works to go ahead. Their decision must be made within a six-week period. If no decision is made within the six-week period, the work may be carried out, providing it is done within a two-year period.

3.6 If trees protected by a TPO or within conservation areas are cut-down, topped, lopped, uprooted or will fully damaged or destroyed, the owner of the tree(s) and the contractor responsible for the work can both be legally prosecuted. The current maximum fine is £20,000 per tree at the Magistrates Court or unlimited fine at the Crown Court.

3.7 Trees that are dead, dying or dangerous are exempt from legislation. It is common good practice to notify the LPA of intention to carry out work to trees that fall into these categories, preferably with some notice (e.g. one working week).

3.8 A leaflet produced by the DTLR (Protected Trees), covers the issues raised by this legislation (enclosed).

Section
4

Site Information

4.1 The trees inspected are growing on or near a proposed development site where there is a plan to demolish the existent building and redevelop the site with a single dwelling.

4.2 The site is situated within a residential area.

4.3 There is a listed building near the proposed development site, with gardens that share a boundary with the rear garden of the extant property.

4.4 The Client has provided a proposed layout showing the proposed siting of the detached dwelling with adjoining garages. The proposed layout has been taken into consideration in the preparation of this document and conclusions regarding the trees' relationship with the new dwelling can be found in section 8 of this document.

Section
5

Tree Inspection

5.1 IDENTIFICATION

All the significant trees in the front garden were tagged with numbered aluminium discs, attached to the tree with two aluminium nails at around head height. The hedges were not tagged as they are easily referenced on the topographical survey. Trees in or adjoining the rear garden were not tagged either due to their easy identification or their inaccessibility. Numbering starts at 891.

5.2 ASSESSMENT

The trees were assessed on the following criteria, which relates directly to BS3837: 2005

- Species – gives information on expected growth, habit, life expectancy and suitability for situation
- Remaining contribution (in years) – information used to assess the retention category of the tree and potential future growth.
- Diameter of main stem at 1.5 metres above ground – information to use in calculating the Root Protection Area
- Physiological and structural condition
- Category grading in accordance with Table 1 BS5837: 2005

5.3 FINDINGS

5.3.1 The full tree entries can be seen in Appendix A

5.3.2 There are a number of young trees shrubs of a wide age class. These can generally not be seen from outside the property.

5.3.3 The garden to the north east of the property contains a number of 7-8 metre high hollies.

Section
6

Potential Impact of Development on Trees

6.1 Construction can impose enormous strain on trees through damage to, or loss of root mass. The root system is the part of the tree most susceptible to damage during construction.

Any retained trees could be at risk of root damage through:

- Siting of services and excavation causing root severance
- Access for plant and vehicles which may cause compaction of the root zone leading to root death through asphyxiation
- Storage of materials or spillage of damaging substances such as fuel oil, petrol or lime which can kill roots.
- The raising of soil levels which can kill roots through asphyxiation
- The lowering soil levels which removes root mass, including many of the fine water collecting roots and beneficial humus layer

6.2 Construction can threaten the aerial parts of the tree through:

- Physical damage by contact from various plant and delivery vehicles
- The lighting of fires
- Erection of scaffolding

6.3 The British Standard 5837: 2005 'Trees in Relation to Construction' gives guidance that is more detailed on the implications of constructing near to trees in Annex 'C'.

6.4 The symptoms that can arise from root damage as identified above can take several years to become evident

6.5 The development may affect the way the wind passes the retained trees, through raising its speed or direction. This may leave weakened or newly exposed trees liable to wind throw.

Section
7

Potential Impact of Trees on Development

7.1 It is desirable to retain trees as they add maturity and structure to a site; provide shade and amenity value; screening or acoustic barrier.

7.2 Trees that cast shade may not be welcomed by a new resident and may lead to pressure to prune the trees or neighbourly disputes.

7.3 Leaves falling from any of the retained trees may block the gutters of the house or may become a potential slip hazard.

7.4 Trees can affect the type and depth of foundations used.

7.5 Some trees are not suitable for retention on a housing development due to brittle wood, poisonous berries or leaves, prickles and thorns.

7.6 Trees can add value to property

7.7 Very large trees can put off prospective buyers because they perceive the trees to be imposing and dangerous

Section
8

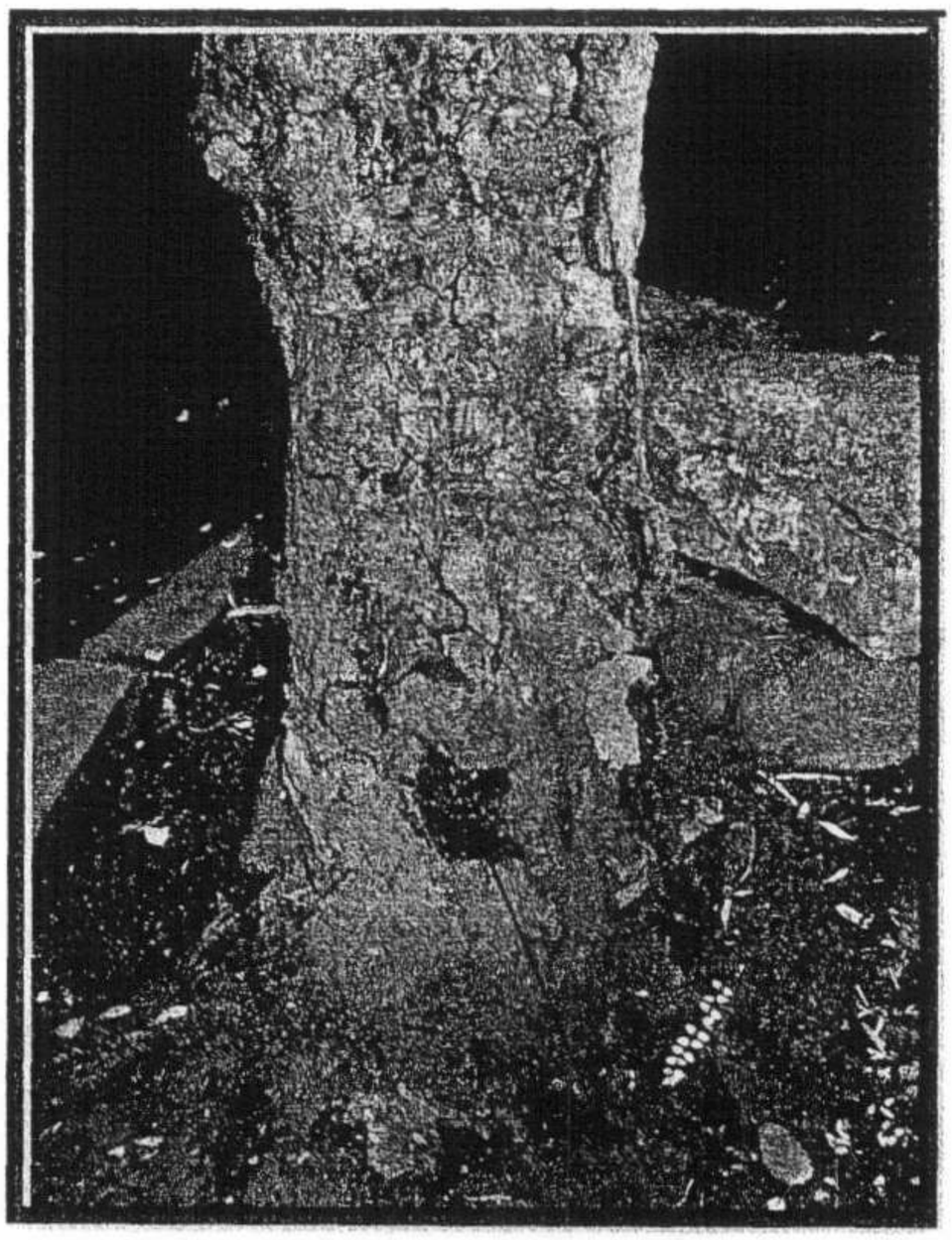
Conclusions

8.1 The Bay Laurel (901) is an attractive plant but it would be very difficult or financially prohibitive to retain the tree during demolition and re-development. Any perceived loss of amenity could be ameliorated through the landscape proposals.

8.2 The Leyland Cypress (902) offers some screening to the site and has some conservation value in its potential nesting and roosting site. However, it is not in keeping with the overall nature of the area and the potential re-development would be an opportunity to replace the tree with a more suitable species.

8.3 The Laburnum (903) is a mature tree and whilst it may be possible to successfully retain the tree during demolition and re-development the effort may not be justified for a tree in the latter stage of life. The tree can be retained if required/desirable but its visual amenity could be replaced within the landscape proposals.

8.4 The Magnolia (904) is in poor condition and must be felled and replaced. (See fig 1.)



8.5 The young Prunus sp. (location A) provide screening of the adjacent property to the north and should not be affected by development activity if adequately protected.

8.6 The Lawson's Cypress (location B) is a young tree with the potential to grow much larger. It provides screening and should not be affected by development activity if adequately protected.

8.7 The Hawthorn (location C) is a fine tree at the top of the raised border, near the property boundary. It should not be affected by development activity if adequately protected

8.8 The group of 3 Leyland Cypress (location D) offer little to the site and their removal is desirable. The potential re-development would be an opportunity to replace the trees with more suitable species.

8.9 The Sycamore (location E) is growing on the adjacent property. It is subject to a Tree Preservation Order and it must be protected above and below ground before and during construction with adequate root protection and consideration of its branch spread. It is not possible to move the Root Protection Area (RPA) due to the constraints of the available rooting area.

8.10 The Leyland Cypress hedges at the front and side of the site offer screening to the site but the potential re-development gives an opportunity to remove the trees and replace them with species more in keeping with the conservation values of the area.

8.11 The future growth of the Sycamore (location E) may eventually lead to the crown spreading over the roof of the proposed dwelling. Minor pruning may be required from time to time in order to maintain a clearance between the tree and building but this should not adversely affect the amenity value of the tree if carried out to BS3998.

8.12 The drawing provided shows the driveway adjacent to the TPO Sycamore as 'Paved'. It will be necessary to construct the drive in such a way as to avoid any root severance, compaction, contamination or raising or lowering of soil levels within the RPA shown on the drawing in Appendix 'B'. I understand the intention is to construct the driveway over the existing level, in which case it is important to ensure that gaseous exchange can take place within the rootzone.

8.2 Successful Retention

8.2.1 Trees will need to be adequately protected from the construction activity if they are to be successfully retained. A Tree Protection Plan and Arboricultural Method Statement can be produced by the writer of this report, if required.

8.3 Statutory Protection

8.3.1 In my assessment, there are no trees in suitable condition for inclusion in a Tree Preservation Order that have sufficient amenity value.

8.3.2 The TPO on the site, which previously protected a tree at the front of the site should now be revoked or varied (as appropriate) as it is a legal charge on the property and will continue to be found during a local search for house moving purposes.

Section
9

Recommendations

9.1 Fell and replace Bay Laurel (901), Leyland Cypress (902) and Magnolia (904). The adjacent properties (14 and 16 Redington Road) have Silver Birch at the front and this may be an acceptable species for proposed replanting at the front of this site. They are tolerant of a wide range of site conditions and cast light, dappled shade.

9.2 Consider the removal of Laburnum (903) if an undue constraint and replace the tree within the landscape proposals.

9.3 *Remove the Leyland Cypress group (location D).*

9.4 TREE WORK

- Tree work is skilled and potentially dangerous work, which must be carried out by trained and certificated staff working to BS: 3998 and working in accordance with the various Regulations within the Health and safety at Work Act 1974
- Contractors must have Public Liability Insurance (preferably £5 million) and Employer's Liability Insurance (preferably £10 million).
- Machinery and equipment must be maintained, inspected and operated in accordance with the various Regulations within the Health and Safety at Work Act.
- Tree work must be carried out as a first operation, before ANY construction activity. This is best for tree preservation, practicality, cost-effectiveness and safety.

9.5 PROTECTION OF RETAINED TREES

9.5.1 Protective fencing and/or root protection measures MUST be in place BEFORE any demolition or construction starts, located as shown on a Tree Protection Plan, until construction is complete.

9.5.2 Driveway construction within the RPA of the TPO Sycamore must be carried out without damaging the roots. A trail excavation by hand is recommended to assess the depth of previous excavation and presence of roots. The significance of the roots found must be assessed by an arboriculturalist.

9.6 FUTURE MANAGEMENT

9.6.1 *Retained trees must be re-inspected annually by a qualified arboriculturalist.*

9.6.2 Protective fencing must only be removed once construction is complete.

I hope you find this report satisfactory, please do not hesitate to contact me at my office if I can be of further assistance.

Signed: Date: 18th October 2005

A M Belson Dip. Arb. (RFS) Tech. Cert. Arbor. A

4.4.3 The tree survey may identify the presence of veteran trees on the site. Such trees should be considered carefully in relation to new development, as it is rarely acceptable to locate them within developed areas, rather than open space. The implications of their presence on the land use of the surrounding site should be assessed at the earliest possible stage of the planning process. Veteran trees should be assessed according to the recommendations in **4.3.1**. By this assessment, most genuine veteran trees are likely to be included in category A3.

4.5 Tree survey — post-planning

It is recognized that, on occasions, arboricultural advice is not sought until after a preliminary site layout has been prepared. Although this is not the ideal situation, timely and appropriate expert advice can still make a valuable contribution to the process of tree retention and protection. In cases where the arboriculturist is provided with a layout, the tree survey should be undertaken as described in 4.2 to provide advice on tree retention, protection, remedial or mitigation works and new landscape design. It is essential that the trees are assessed objectively and without reference to site layout proposals.

5 Tree constraints plan

5.1 General

The influence that trees on and adjacent to the site will have on the layout should be plotted on a plan called the tree constraints plan (TCP). This is a design tool which should show the below ground constraints, represented by the RPA, and the above ground constraints the trees pose by virtue of their size and position.

5.2 Root protection area (RPA)

5.2.1 In order to avoid damage to the roots or rooting environment of retained trees, the RPA should be plotted around each of the category A, B and C trees (see 4.3). This is a minimum area in m^2 which should be left undisturbed around each retained tree.

5.2.2 The RPA should be calculated using Table 2 as an area equivalent to a circle with a radius 12 times the stem diameter for single stem trees and 10 times basal diameter for trees with more than one stem arising below 1.5 m above ground level.

Table 2 — Calculating the RPA

Number of stems	Calculation
Single stem tree	$RPA(m^2) = \left(\frac{\text{stem diameter (mm) @ 1.5 m} \times 12}{1\ 000}\right)^2 \times 3.142$
Tree with more than one stem arising below 1.5 m above ground level	$RPA(m^2) = \left(\frac{\text{Basal diameter (measured immediately above root flare (mm)} \times 10}{1\ 000}\right)^2 \times 3.142$
NOTE The 12× multiplier is based on NJUG 10 [9] and published work by Matheny and Clark [10].	

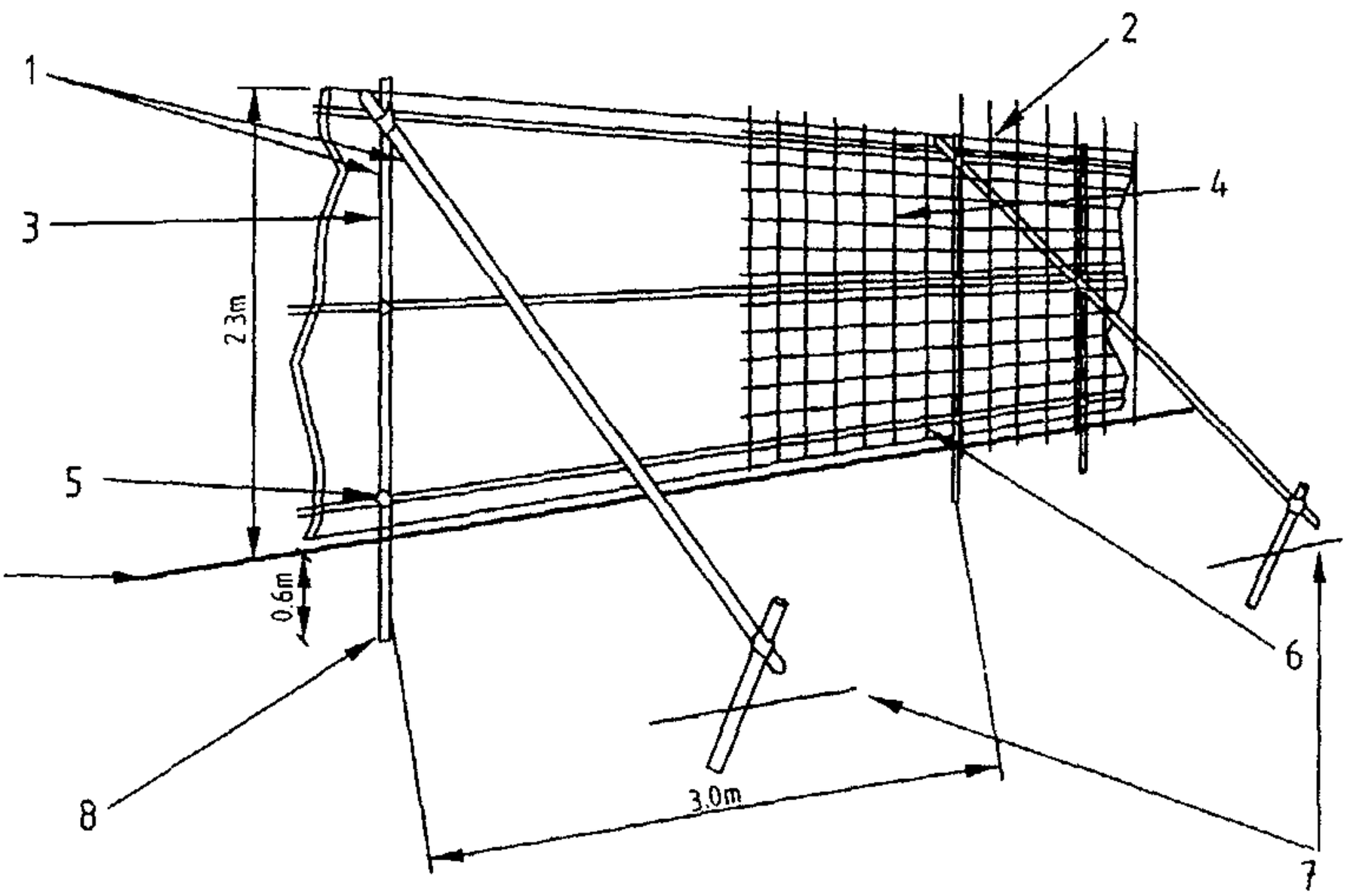
5.2.3 The calculated RPA should be capped to 707 m^2, e.g. which is equivalent to a circle with a radius of 15 m or a square with approximately 26 m sides.

9.3 Ground protection

9.3.1 Where it has been agreed during the design stage, and shown on the tree protection plan, that vehicular or pedestrian access for the construction operation may take place within the root protection area (RPA), the possible effects of construction activity should be addressed by a combination of barriers and ground protection. The position of the barrier may be shown within the RPA at the edge of the agreed working zone but the soil structure beyond the barrier to the edge of the RPA should be protected with ground protection.

9.3.2 For pedestrian movements within the RPA the installation of ground protection in the form of a single thickness of scaffold boards on top of a compressible layer laid onto a geotextile, or supported by scaffold, may be acceptable (see Figure 3).

9.3.3 For wheeled or tracked construction traffic movements within the RPA the ground protection should be designed by an engineer to accommodate the likely loading and may involve the use of proprietary systems or reinforced concrete slabs (see **11.8** and **11.9**).



1 Standard scaffold poles

2 Uprights to be driven into the ground

3 Panels secured to uprights with wire ties and where necessary standard scaffold clamps

4 Weldmesh wired to the uprights and horizontals

5 Standard clamps

6 Wire twisted and secured on inside face of fencing to avoid easy dismantling

7 Ground level

8 Approx 0.6 m driven into the ground

Figure 2 — Protective barrier

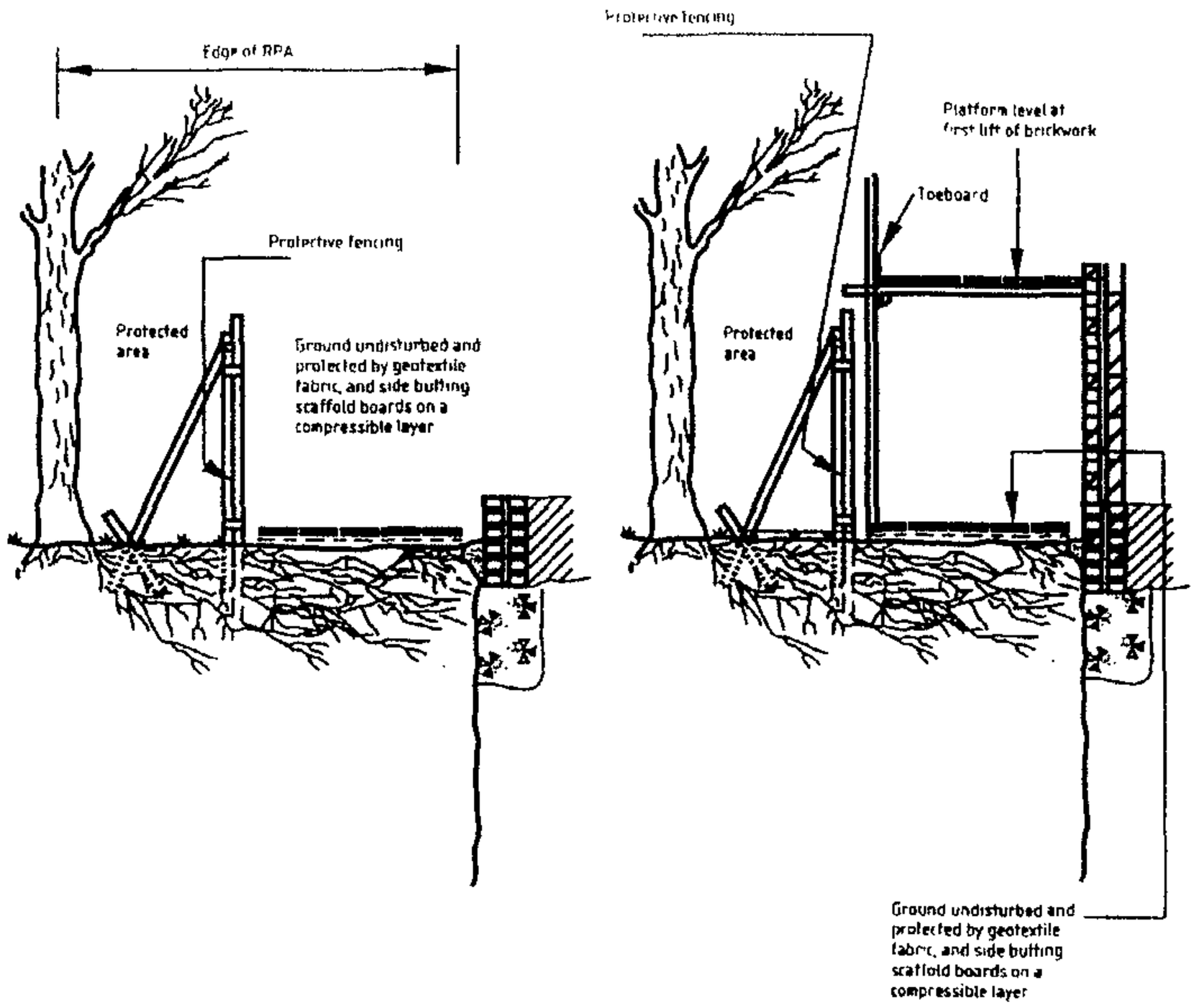


Figure 3 — Scaffolding within the RPA

9.4 Additional precautions outside the exclusion zone

9.4.1 Once the exclusion zone has been protected by barriers and/or ground protection, construction work can commence. All weather notices should be erected on the barrier with words such as:

"Construction exclusion zone — Keep out".

9.4.2 In addition the following should be addressed or avoided.

a) Care should be taken when planning site operations to ensure that wide or tall loads, or plant with booms, jibs and counterweights can operate without coming into contact with retained trees. Such contact can result in serious damage to them and might make their safe retention impossible. Consequently, any transit or traverse of plant in close proximity to trees should be conducted under the supervision of a banksman to ensure that adequate clearance from trees is maintained at all times. In some circumstances it may be impossible to maintain adequate clearance thus necessitating access facilitation pruning (see 11.2.1).

b) Material which will contaminate the soil, e.g. concrete mixings, diesel oil and vehicle washings, should not be discharged within 10 m of the tree stem.

c) Fires should not be lit in a position where their flames can extend to within 5 m of foliage, branches of trunk. This will depend on the size of the fire and the wind direction.

d) Notice boards, telephone cables or other services should not be attached to any part of the tree.

Table 1 — Cascade chart for tree quality assessment

TREES FOR REMOVAL		
Category and definition	**Criteria**	**Identification on plan**
Category R Those in such a condition that *any existing value would be lost* within 10 years and which should, in the current context, be removed for reasons of sound arboricultural management	• Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other R category trees (i.e. where, for whatever reason, the *loss of companion shelter cannot be mitigated by pruning*) • Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline • Trees infected with pathogens of significance to the health and/or safety of other trees nearby (e.g. Dutch elm disease), or very low quality trees suppressing adjacent trees of better quality NOTE Habitat reinstatement may be appropriate (e.g. R category tree used as a bat roost: installation of bat box in nearby tree).	DARK RED

TREES TO BE CONSIDERED FOR RETENTION				
Category and definition	**Criteria — Subcategories**			**Identification on plan**
	1 Mainly arboricultural values	**2 Mainly landscape values**	**3 Mainly cultural values, including conservation**	
Category A **Those of high quality and value:** in such a condition as to be able to make a substantial contribution (*a minimum of 40* years is suggested)	Trees that are particularly good examples of their species, especially if rare or unusual, or essential components of groups, or of formal *or semi-formal arboricultural* features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands which provide a definite screening or softening effect to the locality in relation to views into or out of the site, or those of particular visual importance (e.g. avenues or *other arboricultural features assessed as groups)*	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or *wood-pasture)*	LIGHT GREEN
Category B **Those of moderate quality and value:** those in such a condition as to make a significant contribution (a minimum of 20 *years is suggested)*	Trees that might be included in the high category, but are downgraded because of impaired condition (e.g. presence of remediable defects including unsympathetic past *management and minor storm* damage)	Trees present in numbers, usually as groups or woodlands, such that they form distinct landscape features, thereby attracting a higher collective rating than they might as individuals but which are not, individually, essential components of *formal or semi-formal arboricultural features* (e.g. trees of moderate quality within an avenue that includes better. A category specimens), or trees situated mainly internally to the site, therefore individually having little visual impact on the wider locality	Trees with clearly identifiable conservation or other cultural benefits	*MID BLUE*
Category C **Those of low quality and value:** *currently in adequate* condition to remain until new planting could be established (a minimum of 10 years is suggested), or young trees with a stem diameter below 150 mm	Trees not qualifying in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater *landscape value, and/or trees offering low or only* temporary screening benefit	Trees with very limited conservation or other cultural benefits	GREY
	NOTE Whilst C category trees will usually not be retained where they would impose a significant constraint on development, young trees with a stem diameter of less than 150 mm should be considered for relocation.			

5 Tree Constraints Plan (TCP)

5.1 The influence that trees on and adjacent to the site will have on the layout is plotted on a plan called the TCP. This design tool which shows how the below ground constraints, represented by the RPA, and the above ground constraints the trees pose by virtue of their size and position. Also their future potential sizes and influence.

5.2 In order to avoid damage to the rhyzosphear (rooting area) of retained trees, the RPA is plotted around each of the category A, B and C trees. This is a minimum area in m^2, which must be left undisturbed around each retained tree.

5.3 The RPA is calculated using BS 5837 Table 2 (A copy of Table 2 is enclosed within the appendix) as an area equivalent to a circle with a radius 12 times the stem diameter at 1.5m for single stem trees and 10 times basal diameter for trees with more than one stem.

5.4 A copy of the TCP is enclosed within the appendix.

6 Arboricultural Implications Assessment (AIA) and Design Issues

6.1 Due to the juxtaposition of the proposed north-western section of the development and the tree T3. A conflict of interest has arisen between the suggested position of the structure and the RPA. Within the AMS and TPP, remedial measures are suggested as a compromise.

6.2 The current constraints and the future growth potential of all the trees highlighted for retention are of limited significance with regards to both shade and lateral encroachment of the foliage. This is due to all the trees locations and proximity the proposed development of the house. T3's clear stem of 10m and therefor, high canopy should not become a future issue of conflict as long as the building remains two storey.

7 Arboricultural Method Statement (AMS) and Tree Protection Plan (TPP)

7.1 All trees must be adequately protected before development operations start. Therefore the following sequence of operations must work hand in hand with the development process.

i) **Tree Works:** The trees T1 Requires the removal of all deadwood. The tree T3 requires the removal of the overhanging epicormic shoots on the main stem.

ii) **Design implications:** As outlined within 6.1, a compromise is required to limit the disruption to T3's rhyzosphear. Due to the footprint of development falling within a small percentage of the RPA, I suggest the foundations of this section to compromise of pile foundations. This is indicated within the TPP.

iii) **The construction exclusion zone. Barriers and ground protection:** The location of the protective barriers and ground protection is plotted accurately on the TPP. The RPA of all trees, I feel due to the effects of construction on only one side can be retracted by 20% as outlined in BS 5837 5.2.4 a.

The barriers and ground protection must be erected and installed prior to any materials or machinery is brought onto the site and before any demolition, development or stripping of soil commences.

The Barriers: Must consist of a scaffold framework in accordance with BS 5837 Figure 2 (a copy of which is enclosed within the appendix).

The Ground Protection: Pedestrian movement is necessary within the RPA of T3 due to the necessity of the foundations of the development being installed up to the edge of the RPA.
Therefor the installation of ground protection in the form of a single thickness of scaffold boards on top of a compressible layer laid onto geotextile in accordance with BS 5837 Figure 3 (a copy of which is enclosed within the appendix).

Once the exclusion zone has been protected by barriers and or ground protection, construction work can commence. All weather notices should be erected on the barrier with words such as

"Construction exclusion zone-Keep out"

iii) During construction the following processes must be adhered to:

a) No materials can be stored within 5m of the tree's bole.
b) Oil, bitchumen, cement or other material likely to be injurious to a tree must not be stacked or discharged within 5m of the tree's bole.
c) Concrete mixing must not be carried out within 5m of the tree's bole.
d) It is essential that fire must not be lit beneath or within close proximity to the canopies.
e) The trees must not be used as anchorage for equipment.
f) Care must be exercised when using cranes or similar equipment near the spread of the canopy.

iv) Removal of fencing must only occur at the end of construction.

7.2 The tree should be inspected by a competent arboriculturalist again for safety and any deterioration in the trees condition twelve months after the start of construction.