Location Redcliffe Building Xaverian College Manchester

G AND
BUILDING CONTROL
22 MAR 2012

Tag	Species	Condition	Age Class	Life	5837Cat	Height	DBH	Basal D	No Stems	North	East	South	West	Clearance	Notes	Recs
1	Ash Fraxinus Excelsior	Structure good Vigour good	Young	40+	C	7	120		1	3.00	2.00	3.00	3.00	>2	Young specimen with no significant problems - close to existing boundary wall may undermine in time.	Protect
2	Leyland Cypress	Poor structure Vigour good	Middle aged	10-20	C	6	250			2.00	2.00	3.00	2.00	1.00	Covered in ivy unable to fully inspect	Fell
3	Wild Cherry Prunus avium	Poor structure Vigour good	Mature	20-40	C	7	290			4.00	3.00	5.00	3.00	2.00	Upper crown unbalanced - poorly pruned many stubs - mower damage to base - sub dominant added removed.	Fell to allow development
4	Lawson Cypress	Fair Structure Fair Vigour	Middle aged	10-20	C	8	260			2.00	3.00	3.00	3.00	<1	Induced at 3 metres - if allowed to mature will cause conflict with existing building	Fell to allow development
5	Leyland Cypress	Poor structure Vigour good	Young	10-20	C	6		270	3	1.00	1.00	1.00	1.00	2.00	Poor basal union - suppressed - if allowed to mature will cause conflict with existing building	Fell to allow development
6	Lawson Cypress	Poor structure Vigour good	Middle aged	10-20	C	7		410	2	2.00	3.00	2.00	3.00	2.00	Significant deadwood - hanging branch - twin stemmed from base - if allowed to mature will cause conflict with existing building	Fell to allow development
7	Leyland Cypress	Poor structure Fair Vigour	Young	10-20	C	6		270	2	1.00	1.00	1.00	1.00	2.00	Twin stemmed from base - decay stems noticed in both stems - if allowed to mature will cause conflict with existing building	Fell to allow development
8	Lawson Cypress	Poor structure Fair Vigour	Middle aged	0-20	C	7	270		1	3.00	3.00	2.00	2.00	2.00	Stem damage from 0.7m to 1.5m - if allowed to mature will cause conflict with existing building	Fell to allow development
9	Leyland Cypress	Poor structure Fair Vigour	Middle aged	10-20	C	6		410	5	1.00	1.00	1.00	1.00	2.00	Multi stemmed from base - epicormic suppressed - if allowed to mature will cause conflict with existing building	Fell to allow development

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

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)

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)

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.

Tag	Species	Condition	Age Class	Life	5837Cat	Height	DBH	Base D	No Stems	North	East	South	West	Clearance	Notes	Recs
3	Laburnum	Structure fair Vigour fair	Young	10-20	C	4		150s	3	1.00	5.00	1.00	2.00	2.00	In raised shrub bed - no significant problems	Protect
4	Cypress	Structure fair Vigour good	Young	20-40	C	7		390	4	3.00	7.00	1.00	1.00	2.00	In raised shrub bed - poor basal pruning	Protect
15	Ash	Structure fair Vigour good	Young	20-40	C	8		330	3	2.00	3.00	3.00	3.00	1.00	Included bifurcations	Protect
16	Sycamore	Structure fair Vigour good	Young	20-40	C	8	160			1.00	7.00	1.00	1.00	3.00	Phototropic growth habit	Protect
17	Ash	Structure fair Vigour good	Young	20-40	C	8	150			1.00	0.00	1.00	3.00	2.00	Pushing against boundary fence	Protect at present consider removal as sound arboricultural practice in the future
18	Sycamore	Structure fair Vigour good	Young	20-40	C	8	140			1.00	1.00	1.00	2.00	3.00	Pushing against boundary fence	Protect at present consider removal as sound arboricultural practice in the future

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

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)

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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.

Tag	Species	Condition	Age Class	Life	5837Cat	Height	DBH	Basal ID	No Stems	North	East	South	West	Clearance	Notes	Recs
19	Sycamore	Structure poor Vigour good	Young	20-40	C	8	120		1	1.00	2.00	1.00	1.00	3.00	Lower branching missing	Protect
20	Elder	Structure very poor Vigour fair	Over mature	4-10	R	5	480		1	2.00	2.00	2.00	2.00	2.00	Twin stems from 1.5m both stems topped - significant decay	Fell
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
22	Sycamore	Structure fair Vigour good	Mature	20-40	C	12		900e	2	4.00	6.00	5.00	5.00	3.00	Twin stemmed from base - included unions	Protect monitor

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

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)

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)

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.


REGENT PLACE
Nursery
Xaverian College
Xaverian College
Xaverian College
17 to 40
17 to 40
Arbconsultants Ltd
Scale 1:500 @ A3
Appendix 3 Existing trees
Class A trees
Class B trees
Class C trees
Class R trees


REGENT PLACE
Nursery
Xaverian College
Arboconsultants Ltd
Scale 1:500 @ A3
Appendix 4 Tree Constraints Plan
Root Protection Areas
Xaverian College
Xaverian College
17 to 40
17 to 40
Ellers
Eller


REGENT PLACE
Nursery
Xaverian College
Xaverian College
Xaverian College
17 to 40
17 to 40
Arbconsultants Ltd
Scale 1:500 @ A3
Appendix 5 Tree Protection Plan
Protective fences
Ground protection / Scaffold /areas where foundations should be piled and bridged

BS 5837:2005 Trees in relation to construction – Recommendations

Root Protection Area (RPA) Calculator

	Polzoni						Xaverian college				
	15/4/11						Arbconsultants				
Tree ID	Diameter at 1.5m above ground level	Root Protection Area (See Note)	Equivalent to a circle with a radius of	Equivalent to a square with sides of	20% Offset equal to		Basal Diameter measured above root flare	Root Protection Area (See Note)	Equivalent to a circle with a radius of	Equivalent to a square with sides of	20% Offset equal to
1	120	6.5	1.4								
2	250	28.2	3.0								
3	290	38.0	3.4								
4	260	30.5	3.1								
5							270	22.9	2.7		
6							410	52.8	4.1		
7							270	22.9	2.7		
8	270	32.9	3.2								
9							410	52.8	4.1		
10	740	247.7	8.8								
11	470	99.9	5.6								
12	120	6.5	1.4								
13							150e	7.0	1.5		
14							390	47.7	3.9		
15							330	34.2	3.3		
16	160	11.5	1.9								
17	150	10.1	1.8								
18	140	8.8	1.7								
19	120	6.5	1.4								
20	480	104.2	5.7								
21	490	108.6	5.8								
22							900e	254.5	9.0		

Note.

The calculated RPA should be capped to 707m sq, equivalent to a circle with a radius of 15m or a square with approximately 26m sides

BS 5837:2005 Trees in relation to construction – Recommendations

Root Protection Area (RPA) Calculator

	Polzoni								Xaverian college			
	15/4/11								Arbconsultants			
Tree ID	Diameter at 1.5m above ground level	Root Protection Area (See Note)	Equivalent to a circle with a radius of	Equivalent to a square with sides of	20% Offset equal to		Basal Diameter measured above root flare	Root Protection Area (See Note)	Equivalent to a circle with a radius of	Equivalent to a square with sides of	20% Offset equal to	
1	120	6.5	1.4									
2	250	28.2	3.0									
3	290	38.0	3.4									
4	260	30.5	3.1									
5							270	22.9	2.7			
6							410	52.8	4.1			
7							270	22.9	2.7			
8	270	32.9	3.2									
9							410	52.8	4.1			
10	740	247.7	8.8									
11	470	99.9	5.6									
12	120	6.5	1.4									
13							150e	7.0	1.5			
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18	140	8.8	1.7									
19	120	6.5	1.4									
20	480	104.2	5.7									
21	490	108.6	5.8									
22							900e	254.5	9.0			

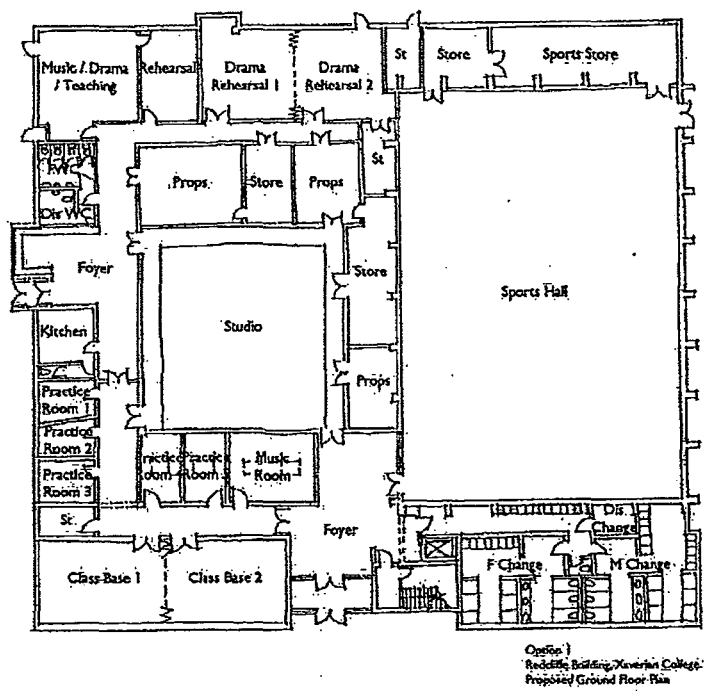
Note

The calculated RPA should be capped to 707m sq, equivalent to a circle with a radius of 15m or a square with approximately 26m sides

arbconsultants ltd

Xaverian College

Arboricultural Implication Assessment (AIA)



Prepared by

Arbconsultants Ltd

Consultants in Urban Forestry, Arboriculture and Environmental Sciences

April 2011

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1.0 Scope and Limitations of Report

1.1 This report has been commissioned by Ms Liz Brown-Lloyd of Pozzoni LLP Chartered Architects & Designers on behalf of Xaverian College and the scope of the report reflects her instructions.

1.2 The scope of the report is limited to a visual inspection for the trees augmented by Additional decay detection / mapping using an IML Resistograph where VTA (Visual Tree Assessment) indicates that this is required.

1.3 The brief is to appraise the trees in relation to the proposed development of the site in accordance with British Standard 5837:2005 'Trees in relation to Construction – Recommendations'.

1.4 To prepare a clear set of report recommendations with supporting plans and data to facilitate consideration of the Arboricultural implications by the Local Planning Authority.

1.5 To consider the development proposals and identify areas where there are arboricultural issues and to recommend possible solutions.

1.6 To consider additional information supplied and identify arboricultural issues arising from this information and to recommend possible solutions.

1.7 This report is not a Tree Risk Management or a Hazard Analysis Report and its use as such is invalid.

1.8 The report refers to the condition of the tree and an assessment of the site on the day that the evaluation was undertaken. The trees were not climbed but were assessed from ground level.

1.9 Due to the changing nature of trees and their site circumstances this report and any recommendations made are limited to a 3 year period. Any alteration to the application site or any development proposals could change the current circumstances and may invalidate this report and any recommendations made. Should this be the case this report will require revision to reflect the development proposals.

1.10 Trees are dynamic structures that can never be guaranteed 100% safe; even those in good condition can suffer damage under average conditions. Regular inspections can help to identify potential problems before they become acute.

1.11 A lack of recommended work does not imply that a tree is safe and likewise it should not be inferred that a tree will be made safe following the completion of any recommended work.

1.12 Trees dimensions were measured using a combination of a Haglof digital Clinometer, a Leica Disto Laser Rangefinder and a Fujikura Diameter tape. All instruments were used in accordance with appropriate user guides..

1.13 Decay detection where used is undertaken using an IML Resistograph.

1.14 All data provided by the testing equipment has been verified according to the equipment manufacturer's instructions.

1.15 No soil samples were taken and no soils analysis was undertaken.

1.16 Any legal description or information given to Arbconsultants Ltd is believed to be accurate.

1.17 Where solutions to arboricultural problems are specified which require the usage of a third party product e.g. no dig roadway construction. No liability is assumed for the performance or suitability of the product and specialist advice as to the suitability or installation of the product should be sought from the manufacturer or the other specialist.

1.18 No responsibility is assumed by Arbconsultants Ltd for legal matters that may arise from this report, and the Consultant shall not be required to give testimony or to attend court unless additional contractual arrangements are made.

1.19 Any alteration or deletion from this report shall invalidate it as a whole.

2.0 Qualifications and Experience

2.1 My name is Christopher Raper and I am a Consultant practising through ArbConsultants Limited, which is an Arboricultural Consultancy Practice based at Myerscough College, Preston and at Whittle-le-Woods Lancashire. The Practice Specialises in Arboriculture, Forestry, Urban Forestry, Biological Sciences and Project Management.

2.2 I am a Consultant specialising in tree failure, hazard evaluation, risk assessment related to trees, planning and developing where trees are involved and insurance claims where tree failure is involved and/or building damage occurs which may be attributed to the activity of trees.

2.3 I have a 1st class honours degree in Arboriculture awarded by Myerscough College in conjunction with the University of Central Lancashire. I have 10 years experience in the Arboricultural industry ranging from Tree Officer with a Local Authority through to Senior Consulting level with Europe's largest specialist Arboricultural Consultancy.

3.0 Summary

3.1 The site is to the front of the Redcliffe Building on Lower Park Road, Manchester M14 5RB.

3.2 The proposal is to create additional classrooms, an ICT room, a staffroom and male and female changing rooms.

3.3 We have not been supplied with detailed drawings showing foundation types therefore we have made certain assumptions and have supplied method statements that will cover most contingencies whereby the development may impact upon the trees. If necessary these method statements can be modified once full technical drawings have been produced.

4.0 BS: 5837:2005 'Trees in relation to construction – Recommendations'

4.1 The trees on site have been surveyed in accordance with BS5837:2005 'Trees in relation to construction – Recommendations'.

4.2 The survey lists all the trees or groups of trees (excluding those trees already scheduled for removal) that may be impacted upon by the development and will include the following information.

- Reference number (to be recorded on the tree survey plan)
- Species
- Height in metres.
- Stem diameter at 1.5m above adjacent ground level (on sloping ground to be taken on the upslope side of the tree base) or immediately above the root flare for multi-stemmed trees.
- Branch spread in meters taken at the four cardinal points to derive an accurate representation of the crown (to be recorded on the tree survey plan).
- Height in meters of the crown clearance above adjacent ground level (to inform on ground clearance, crown stem ratio and shading).
- Age class (young, middle aged, mature, over mature, veteran).
- Physiological condition (e.g. good, fair, poor, dead,). Structural condition, e.g. collapsing, the presence of any decay and physical defect.
- Preliminary management recommendation, including further investigation of suspected defects that require more detailed assessment and potential for wildlife habitat.
- Estimated remaining contribution in years (e.g. less than 10, 10-20, 20-40, more that 40).
- R or A to C category grading (see table 1 of BS 5837:2005).

4.3 The survey is attached at **Appendix 2** of this report

5.0 Grading category and Recommended Tree Works

5.1 Trees that have the potential to be affected by the development have been classified according to BS5837:2005 Table 1, as can be seen in *Chart 1 Category Profile* there are no trees of high quality and only one whose value would be lost within ten years. The vast majority of trees fall into the middle categories for quality.

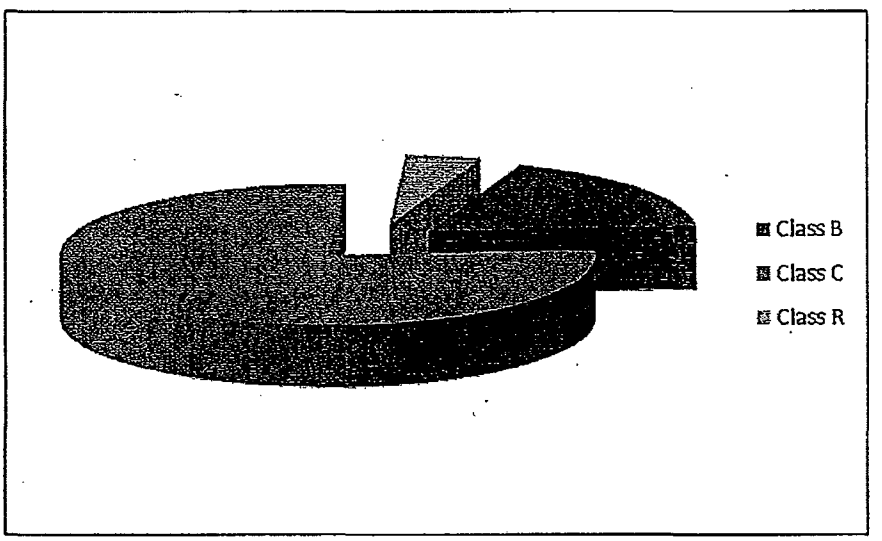


Chart 1: BS5837: 2005 Tree Category

5.2 Category "A" Trees are classified as high quality and value in such condition as to make a substantial contribution for a minimum of 40 years. In our professional opinion there are no surveyed trees that fall into this category.

5.3 Several trees have been classified as Category "B" i.e. those of moderate quality and value: those in such a condition as to make a significant contribution (a minimum of 20 years is suggested). Category B Trees are defined as 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).

Tree ID	Species	Category	Details
10	Horse Chestnut	B1	Significant amenity value, softening the hard landscape, Minor bark damage on stem - significant decay in limb @ 5 metres - contravening Highways Act - Protect - deadwood - reduce by 2 metres to East - Crown raise over road to 5 metres - Ground Protection / scaffold - Pile foundations adjacent to this tree - Monitor
11	Sycamore	B1	Some amenity value as a screen to building - Minor decay pocket on stem - ground raised at base - crossing branches - Protect - Ground Protection / scaffold - Pile foundations adjacent to this tree - Cellular confinement system for footpath to entrance - monitor
12	Ash	B1	Young tree little amenity value- in raised shrub bed - no significant problems - Protect
21	Sycamore	B2	On side boundary some softening of built environment Unable to fully inspect stem due to ivy - minor deadwood in crown - Protect - Ground Protection / scaffold - Pile foundations adjacent to this tree

5.4 The following trees have been classified as Category "C" i.e. those of low quality and value; currently in adequate condition which could if necessary remain until new planting is established, 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.

Tree ID	Species	Category	Details
1	Ash Fraxinus Excelsior	C1	Young specimen with no significant problems - close to retaining boundary wall may undermine in time.- Protect
2	Leyland Cypress	C2	Covered in ivy unable to fully inspect - Fell to facilitate development
3	Wild Cherry Prunus avium	C2	Upper crown unbalanced - poorly pruned many stubs- mower damage to roots- sub dominant leader removed - Fell to facilitate development
4	Lawson Cypress	C2	Included at 3 metres - if allowed to mature will cause conflict with existing building - Fell to facilitate development
5	Leyland Cypress	C2	Poor basal unions - suppressed - if allowed to mature will cause conflict with existing building - Fell to facilitate development
6	Lawson Cypress	C2	Significant deadwood - hanging branch - twin stemmed from base - if allowed to mature will cause conflict with existing building - Fell to facilitate development
7	Leyland Cypress	C2	Twin stemmed from base - decay seams included in both stems - if allowed to mature will cause conflict with existing building Fell to facilitate development -

8	Lawson Cypress	C2	Stem damage from 0.7m to 1.5m - if allowed to mature will cause conflict with existing building - Fell to facilitate development
9	Leyland Cypress	C2	Multi stemmed from base - east side suppressed - if allowed to mature will cause conflict with existing building - Fell to facilitate development
13	Laburnum	C1	In raised shrub bed - no significant problems - Protect
14	Cypress	C1	In raised shrub bed - poor basal pruning - Protect
15	Ash	C2	Included basal unions - Protect
16	Sycamore	C2	Phototropic growth habit - Protect
17	Ash	C2	Pushing against boundary fence - Protect
18	Sycamore	C2	Pushing against boundary fence - Protect
19	Sycamore	C2	Young tree - Lower branching missing - Protect
22	Sycamore	C2	Twin stemmed from base -included unions – Protect - Monitor

5.5 The standards states Category "C" trees will **not** usually be retained where they would impose a significant constraint on development.

5.6 Category "R" trees are 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. Examples include...

- 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 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.

Tree ID	Species	Category	Details
20	Elder	R	Twin stems from 1.8m both stems topped - significant decay - Fell

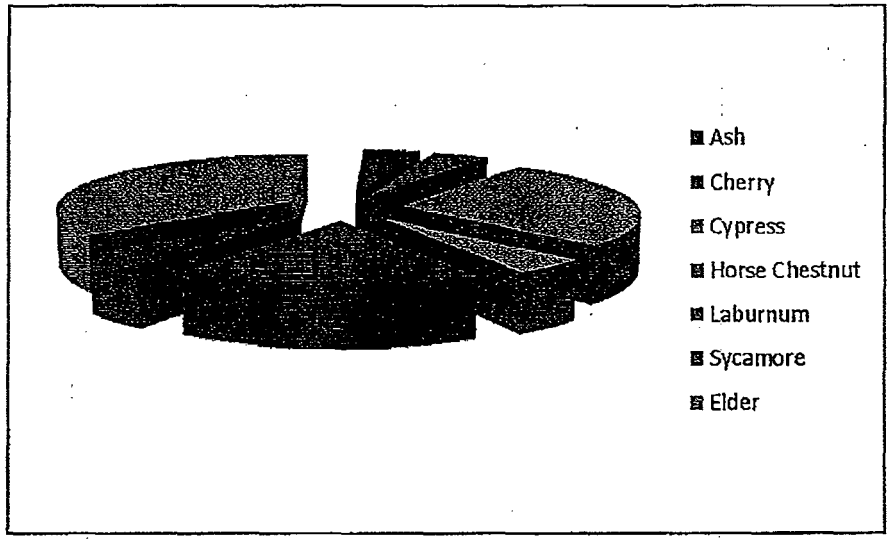


Chart 2 Tree Species Profile

5.7 The trees that may be impacted upon by the development consist mainly of poor quality Cypress trees; additionally there would be the loss of a mature Cherry.

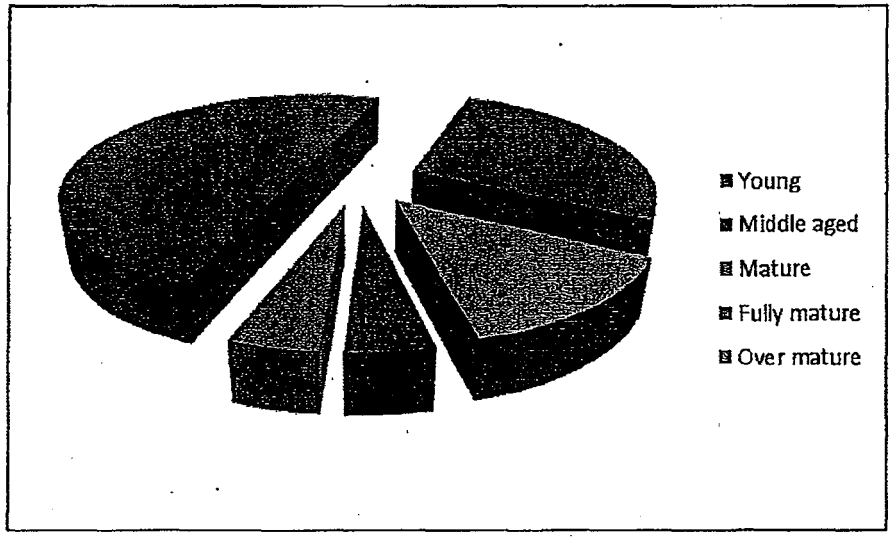


Chart 3 Tree Age Profile

5.8 As can be deduced from Chart 3 the age profile on the site is predominantly young with a significant cohort of middle aged and mature trees. The young trees are principally poor quality Cypress or self-seeded Ash and Sycamore.

5.9 It is recommended that the following works are undertaken prior to the erection of protective fencing and certainly prior to development.

5.10 The canopy of tree number T10 extends over the proposed site. It is recommended that the tree is dead-wooded and reduced by 2 metres to the East and balanced at this stage in order to prevent future conflict with the development and to allow for the use of machinery and the erection of scaffolding; it should also be crown raised over the adjacent road to 5.2 metres to conform to the Highways Act. Trees T22 and T21 should be reduced by 2 metres to the South to prevent conflict with the building and to allow the erection of scaffolding. Tree T20 should be felled for sound arboricultural reasons and we propose that trees T2, T3, T4, T5, T6, T7, T8 and T9 should be felled to facilitate development.

5.11 As part of the survey other works were identified which should be undertaken as part of good arboricultural practice these are detailed in the tree data tables at appendix 2. It is recommended that consideration be given to these works.

5.12 *Permissions*: Under no circumstances is any tree work to be instigated without having first checked with the Local Planning Authority that no statutory controls apply in respect of the trees. All tree workers shall have the relevant NPTC qualifications and shall submit completed risk assessments to the project manager prior to commencement of tree-work.

5.13 All pruning shall be done in accordance with the principles of 'Natural Target Pruning' and in accordance with the current relevant British Standard, **BS3998: 1989** 'Recommendations for Tree Work'. All pruned sections shall be lowered to the ground in a controlled manner such that no damage is done to other trees or vegetation and structures beneath. The implication of tree works must have regard to the presence of any nesting Birds or Bats and their roosts, which are protected under the Wildlife and Countryside Act 1981.

6.0 Tree Constraints – Calculated Root Protection Area (RPA)

6.1 BS5837 (2005) requires that the root protection area is calculated for each of the retained trees on the development. The root protection area is the minimum area in m^2 which should be left undisturbed around each retained tree.

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

Table 2 – Calculating the RPA

Number of Stems	Calculations
Single Stem Tree	RPA(m^2) = (stem diameter (mm) @ 1.5 m ×12) ^{2} × 3.142
Tree with more than one stem arising below 1.5m above ground level	RPA(m^2) = (Basal diameter(measured immediately above root flare(mm)×10)^2×3.142
NOTE the 12× multiplier is based on NJUG 10 (9) and published work by Matheny and Clark (10)	

6.2 The standard calculated RPA's and the protection zone radii are detailed at appendix 6 of this report.

6.3 The RPA, for each tree as determined in Table 2, should be plotted on the TCP taking full account of the following factors, as assessed by an arboriculturalist, which may change its shape but not reduce its area whilst still providing adequate protection for the root system.

a) The likely tolerance of the tree to root disturbance or damage, based on factors such as species, age and condition and presence of other trees. (for individual open grown trees only, it may be acceptable to offset the distance by up to 20% in one direction).

b) The morphology and disposition of the roots, when known to be influenced by past or existing site conditions (e.g. the presence of roads, structures and underground services).

c) The soil type and structure.

d) Topography and drainage.

7.0 Tree Constraints – Incursions into the Root Protection Area (RPA)

7.1 The proposed development will potentially involve incursions into the defined root protection areas (i) demolition/removal of the existing hard landscaping (ii) pedestrian and construction vehicle movement within the RPA (iii) provision of scaffold during construction (iv) the installation of services (v) the use of specialist foundation types and (vi) the construction of a pathways for access to the development.

7.2 BS 5837:2005 accepts that whilst the most reliable way to ensure tree retention is to ensure the RPA is completely undisturbed, it may be necessary to undertake demolition operations and to incorporate hard surfaces and other construction within it. The ability of a tree to tolerate disturbance depends on individual circumstances including the prevailing site conditions.

7.3 The Standard recommends that the advice of an Arboriculturist should be sought for any operations within the RPA. The standard defines an Arboriculturist as 'a person who has, through relevant education, training and experience, gained recognized qualifications and expertise in the field of trees in relation to construction'.

7.4 The information contained within section 2.0 of this report demonstrates that I fulfil the criteria required of an Arboriculturist as defined by the Standard.

7.5 The nature of the incursions into the RPA are such that provided special care is taken and Method Statements are followed and it is my professional opinion that the trees affected by the proposals are able to tolerate the disturbance proposed.

7.6 Method statement relating to the proposed incursions into the RPA follow at section 8.0

8.0 Arboricultural Method Statement – Demolition / Removal of existing surfaces

8.1 Where it is intended to undertake demolition or construction operations within the root protection area, precautions should be taken to maintain the condition and health of the root system and in particular to:

a) Prevent physical damage to the roots during demolition or construction (such as by soil compaction or severing);

b) Make provision for water and oxygen to reach the roots;

c) Allow for the future growth of the root system;

d) Preserve the soil structure at a suitable bulk density for root growth and function (in particular for soils of a high fines content).

8.2 Throughout the process of demolition or construction, the soil structure within the root protection area should be protected. The methods of protecting trees from damage during all phases of demolition and construction work will be specified in section 9.0 and conform to the specifications laid down in the Standard.

8.3 All plant and vehicles engaged in demolition works will either operate outside the RPA, or will run on a temporary surface designed to protect the underlying soil structure. Where such ground protection is required, it will be installed prior to commencement of operations.

8.4 Should the level of dust build-up on trees become significant, the advice of an Arboriculturist will be sought. If considered appropriate by the attending Arboriculturist the affected trees will be hosed down immediately.

8.5 Where an existing hard surface is scheduled for removal, care will be taken not to disturb tree roots that may be present beneath it. Hand held tools or appropriate machinery will be used (under arboricultural supervision) to remove the existing surface. Tree roots exposed by such operations will be treated in accordance with details in 8.6.

8.6 Any excavations which have to be undertaken within the root protection area will be carried out carefully using airspade technology, avoiding damage to the protective bark covering larger roots. Roots, whilst exposed, will be wrapped in dry, clean Hessian sacking to prevent desiccation and to protect from rapid temperature changes. Roots smaller than 25 mm diameter may be pruned back, preferably to a side branch, using a proprietary cutting tool such as bypass secateurs or handsaws. Roots larger than 25 mm will only be severed following consultation with an Arboriculturist, as they may be essential to the tree's health and stability. Prior to backfilling, any Hessian wrapping will be removed and retained roots should be surrounded with sharp sand (builders' sand will not be used because of its high salt content which is toxic to tree roots), or other loose granular fill, before soil or other material is replaced. This material will be free of contaminants and other foreign objects potentially injurious to tree roots.

8.7 Arboricultural Method Statement – Ground Protection

8.8 Where it has been defined during the design stage, and shown on the tree protection plan, that vehicular or pedestrian access for the construction operation is required within the root protection area (RPA), the possible effects of construction activity will be addressed by a combination of barriers and ground protection. The position of the barrier is 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 will be protected with ground protection.

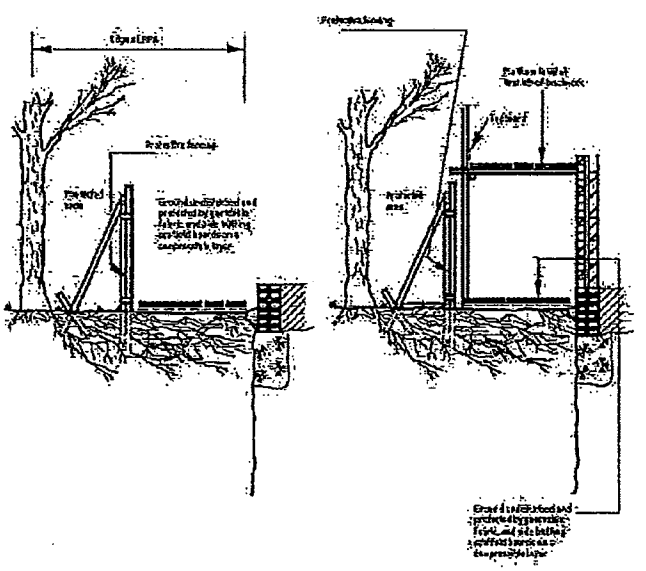
8.9 For pedestrian movements within the RPA the installation of ground protection in the form of a single thickness of scaffold boards on top of a compressible layer (no fines gravel or sand) laid onto a geotextile, or supported by scaffold is proposed.

8.10 Where vehicular movement is proposed within the RPA it is proposed to utilise no dig driveway construction in accordance with APN1 / 12. A three dimensional cellular confinement system will form the sub base to act as a load suspension layer. In addition board will be used on the surface to evenly distribute the carried weight over the track width and wheelbase of any vehicles that will use the access.

8.11 A full specification of the cellular confinement systems proposed follows under the pathway construction section.

8.12 Scaffolding in the RPA

8.13 Scaffolding which is to be erected within the RPA shall be done in accordance with the Standard as detailed below.



8.14 **Installation of Services (Underground and above ground services)**

8.15 Trenching for the installation of underground services severs any roots present and may change the local soil hydrology in a way that adversely affects the health of the tree. For this reason particular care should be taken in the routeing and methods of installation of underground services.

8.16 At all times where services are to pass within the RPA, detailed plans showing the proposed routeing should be drawn up in conjunction with an Arboriculturist. Such plans should also show the levels and access space needed for installing the services and be accompanied by arboricultural method statements (AMS).

8.17 In this instance it is envisaged that there will be no need to install services within the RPA by utilising existing conduits and also by routing the services outside the specified RPA.

8.18 In instances where services may need to pass close to the RPA it is proposed to install these in conjunction with the specification of NJUG 10. All excavations near these trees will take place with an airspade and any root pruning necessary will be undertaken by a qualified Arboriculturist in accordance with both NUG 10 and BS3998.

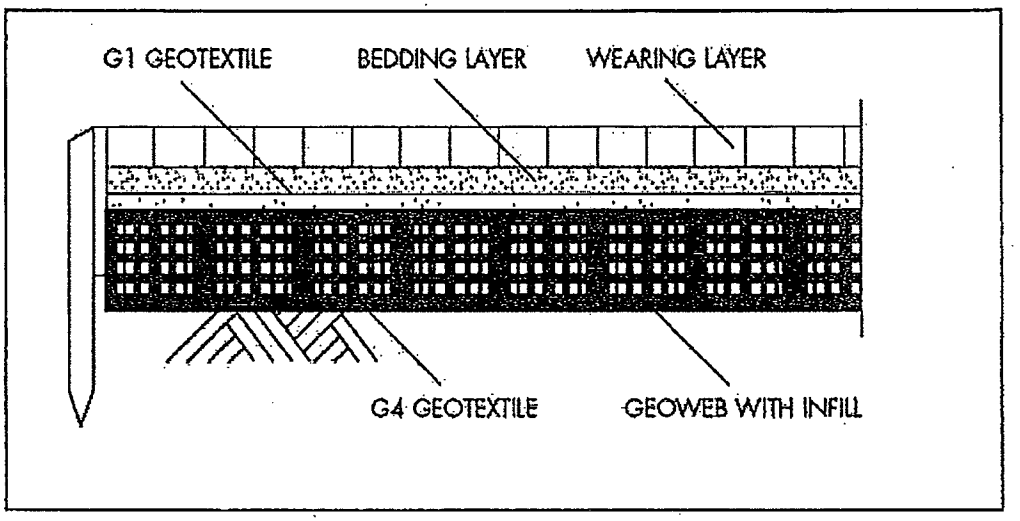
8.19 Consideration will be given to the routing of above ground services in order to avoid the need for detrimental and repetitive pruning. In this regard the current and future crown size of the tree should be assessed.

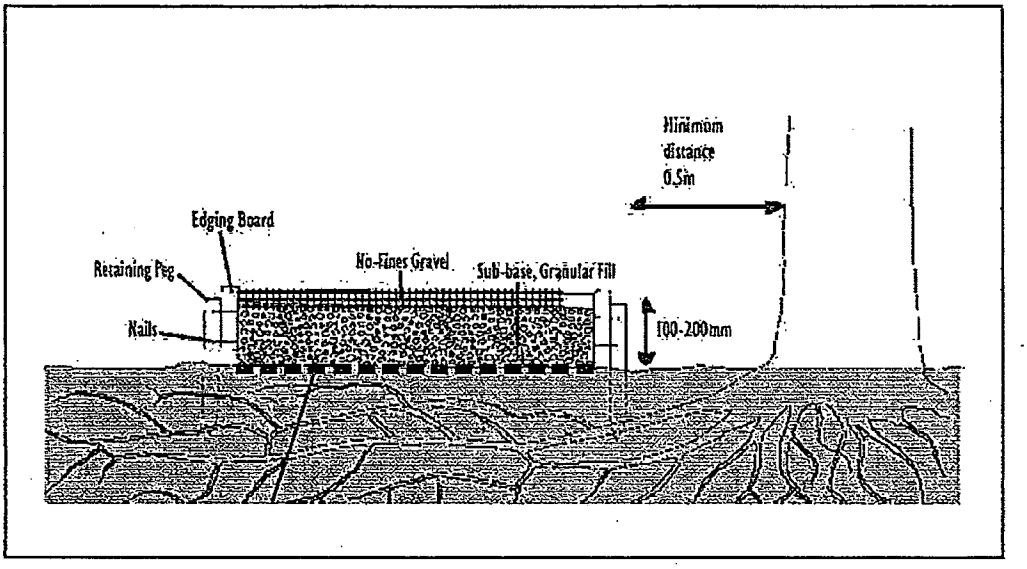
8.20 **Arboricultural Method Statement – Driveways and Pedestrian Surfaces close to trees.**

8.21 In accordance with the guidance supplied in BS 5837:2005 and in APN1 (1996) APN 12 (2007) the use of 'No dig' construction is proposed close to tree number T11

8.22 'No dig' construction is accomplished through the use of a perforated cellular confinement system in the sub-base layer. Cellular confinement systems reduce the overall depth of construction by introducing a cellular structure which dissipates downward loads by a horizontal transfer through the cell structure. This process in conjunction with the perforated cell wall also imports structural integrity to free draining aggregates which would otherwise be unacceptable in road construction. Therefore, a robust, shallow and free-draining sub-base is achieved, which allows vehicular access whilst allowing water and oxygen to permeate down to the tree roots.

8.23 A sub -base will be formed using a cellular confinement system (e.g. Terram, Cooper-Clarke Geoweb or Geosynthetics Cellweb) to retain no-fines granular fill. A geotextile mat should first be laid on the ground surface on top of which a cellular confinement system should be installed (100 mm deep). Another layer of geotextile should then be laid followed by a bedding layer of inert stone and then finally a wearing layer of gas and water permeable tarmac or pavings. The Cellular Confinement System should be installed by competent technicians and the void space to be loose-filled with 5-15mm diameter inert no-fines granular fill.





8.24 The excavation needed for the placement of kerbs, edgings and their associated foundations and haunchings can damage tree roots. Within the RPA, this will be avoided either by the use of alternative methods of edge support. The final specification will be defined by the project architect. Where it is necessary to pin kerbing in place, the pins should, where practical, be located clear of any major tree roots visible on the surface.

8.25 **Specialist Foundation Types**

8.26 It is proposed that where the planned extension to the building intersects with the edge of the Root Protection Areas of trees T10 and T21 strip foundations should not be used but piles and bridge foundations should support the construction.

8.27 The piles should be installed using a rig with a remote power unit thereby avoiding compaction of the rhyzosphere. The pile holes shall be lined with an impermeable membrane to protect tree roots in the adjacent soil from concrete leachate.

8.28 **Additional precautions outside the exclusion zone :-**

8.29 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".

8.30 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.

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

8.27 It is essential that allowance should be made for the slope of the ground so that damaging materials such as concrete washings, mortar or diesel oil cannot run towards trees.

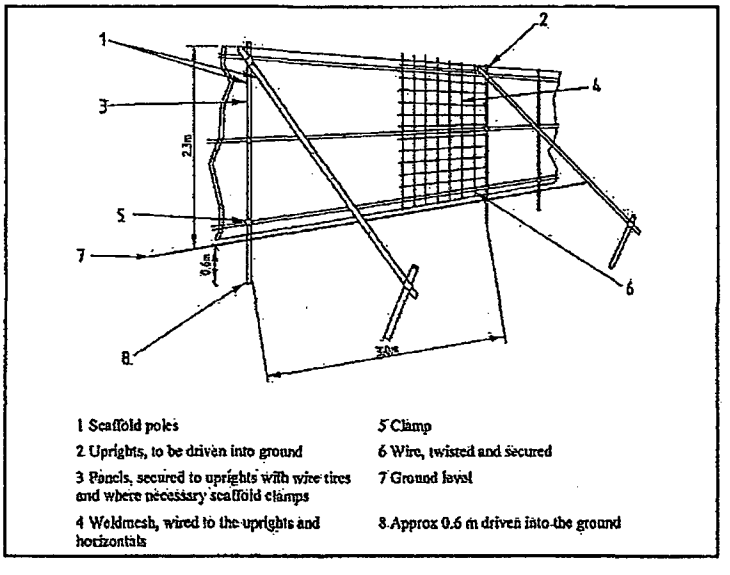
9.0 Tree Protection Plan (TPP)

9.1 The exclusion zones as defined in this report will be protected with fencing. The fencing is to be strong enough to resist impacts and suitable to the degree of construction activity on the site and to be in accordance with that specified within paragraph 9.2 of BS5837:2005.

9.2 All fencing will be in place prior to any other development work (with the exception of necessary tree works) commencing on site. Such fencing will therefore be erected before any materials or machinery is brought onto site. Once erected the fences will not be moved or altered in any way without prior consultation with the Local Planning Authority other than for operations detailed in this report. If the fencing is damaged in any way it will be re-instated to its original condition before construction work can re-commence Notices will be erected on the fencing stating Protected Area – No Operations within Fenced Area. Protective fences shall be maintained in situ until all equipment, machinery and surplus materials have been removed from the site. Nothing will be stored or placed in any area fenced in accordance with this condition and the ground levels within those areas shall not be altered, nor shall any excavation be made other than those detailed in this report, without the written consent of the Local Planning Authority.

9.3 The total exclusion zones are marked on the accompanying drawing in Appendix 5 (Tree Protection Plan). British Standard 5837:2005 (Appendix 2) indicates the recommended areas for the Root Protection Areas (RPA) which should be enforced with protective fencing. Specifications within BS5837:2005 inform our recommendations for both the fencing type as detailed below in figure 2 and the location of this fencing which given the works within the RPA is located at the point where works within the RPA stop.

9.4 All protective fencing is to be constructed in accordance with BS: 5837 (2005) – specification reproduced below.



10.0 Conclusion and recommendations

10.1 Trees within the site have been assessed in accordance with BS:5837:2005.

10.2 Some of the trees afford significant amenity in particular through their function as a screen and as a softening of the hard landscape.

10.3 Twenty two trees have been assessed in response to the proposed development.

10.4 It is anticipated that a number of poor quality trees will be removed in order to facilitate the development.

10.5 One tree have been identified which would be classified as Category R i.e. those which should be removed as part of sound arboricultural practice. The remainder of trees assessed are generally of moderate quality (Category B) with a significant cohort of low quality (Category C).

10.6 The site compound should be situated away from all trees on the adjacent car park.

10.7 The impact of the proposed development has been assessed and in our professional opinion provided that the works take place in accordance with the method statements specified in this report the works will not be detrimental to the retained trees.

10.8 No work shall commence on site until such time as this method statement has been submitted to and approved in writing by the Local Planning Authority. All retained trees on and trees immediately adjoining the site shall be protected from damage as a result of the works on site, to the satisfaction of the Local Planning Authority in accordance with its guidance notes and relevant British Standards (e.g. BS5837:2005) for the duration of the development. In the event that trees become damaged during construction, the Local Planning Authority shall be notified and remedial action agreed and implemented. In the event that any tree(s) dies or is removed without the prior consent of the Local Planning Authority, it shall be replaced within the first available planting season, in accordance with details agreed with the Local Planning Authority.

10.9 All technical issues relating to arboriculture should be addressed to Arbconsultants Ltd in the first instance. Arbconsultants Ltd will liaise between the Local Planning Authority and any interested parties.

10.10 It is suggested that the development proceeds in accordance with the above recommendations.