AllAboutTrees

Arboricultural & Ecological Consultancy
Chartered Arboriculturalists & Environmentalists

Arboricultural Impact Assessment

For Trees On

Land Adjacent To Tollgate House,

Bedlington

For

Mr Harjit Singh Deol

Institute of Chartered Foresters
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Document Verification

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Appendices

1. Introduction

1.1 We are instructed by Mr Harjit Singh Deol to provide an Arboricultural Impact Assessment (AIA) for the significant trees located within a specified area adjacent to Tollgate House, Bedlington.

1.2 This report is produced to evaluate the proposed construction of 12x residential units and associated infrastructure. The developments juxtaposition with the existing trees is considered.

1.3 We were provided with the following documents:

- Existing plan in digital AutoCAD format
- Proposed development plans in digital AutoCAD format

1.4 This assessment is concerned with recording the species, size and condition of the trees. Recommendations are made where appropriate to establish acceptable levels of safety for the site and also to establish a higher level of arboricultural management.

1.5 The trees are also evaluated for the purposes of British Standard 5837–2012 Trees in relation to design, demolition & construction, with regard to their quality and value. The type and size of the root protection area is calculated and the position of the protective barriers is determined. The remaining contribution or safe useful life expectancy is estimated as an indication of the trees period of retention.

1.6 All observations were from ground level without detailed investigation. No invasive examination or climbing inspections were carried out to confirm visual or audible signs of defect and no tissue or soil samples were taken for laboratory analysis.

1.7 Trees are living organisms whose health and condition may change rapidly and all observations, recommendations and conclusions are based on the status of the tree at the time of inspection. The recommendations contained within this report are valid for a period of one year only.

1.7.1 Both abiotic and biotic factors can alter the health/structural integrity of trees rapidly. No liability can be accepted for any physiological or structural deterioration of the tree occurring after the date of our inspection or that was not evident on the day of inspection. Where this report is relied upon at a later date the reader should be aware that the physiological and structural condition of the surveyed trees may have changed; Re-inspection may lead to significantly different observations, recommendations and conclusions.

1.7.2 Any significant alteration to the site which may affect the trees (demolition activity, construction activity, alterations to infrastructure, level

changes, hydrological changes, extreme climatic events, etc) will necessitate a re- assessment of the trees.

1.8 This report was prepared for use by our client in accordance with the terms of the contract and for planning purposes only. It is not a substitute for a tree condition, insurance, or mortgage service. Information provided by third parties used in the preparation of this report is assumed to be correct. The contents are copyright and may not be duplicated or used by third parties without the written consent of AllAboutTrees Ltd.

2. Protected Status Of Trees

2.1 Trees may be legally protected, this may either be in the form of a Tree Preservation Order (TPO) or that the trees are located within a Conservation area.

2.2 Potentially large penalties may be enforced for illegally carrying out works on protected trees. It is recommended that checks are made before any works are undertaken and no work should commence until permission has been granted. Please note that there are a number of exemptions from the requirement to obtain a felling licence including land on which full planning permission has been granted by the local authority, however this exemption does not cover land where only outline planning permission has been granted, or on land which has been allocated for residential development within local authority urban and local development plans.

3. Site Visit & Description

Site location – N 55° 08' 37.97 W 01° 34' 42.90
O/S Grid reference- NZ 269 833 GB Grid

Figure 1 - The approximate extent of the study area is shown by the red boundary line above.

3.1 A site visit was undertaken on Saturday 15th January 2022 by Tim Archment. A blanket of mist was present towards the start of the survey though this lifted as the sun rose.

3.2 The study area is an unused parcel of land to the north of Barrington Road, Bedlington. Aerial photography shows it was previously subdivided into two plots. It also appears to show the land has been largely unused over the last ten years.

3.3 Tree cover is primarily limited to the edge of the site. Management works do not appear to have been undertaken for some time.

3.3.1 Storm Arwen of December 2021 appears to have affected some of the trees within the site with a number of complete and partial failures evident in groups 7 & 9.

3.4 A car scrap yard is present immediately north of the study area and the south flank is bound by Barrington Road. Tollgate House is located on the east boundary and access to adjacent residential properties flanks the west boundary.

3.5 There are gentle level changes in the study area, as well as piled spoil. There were no apparent drainage issues at the time of the survey.

4. Appraisal

4.1 The trees have been surveyed on site and plotted on the site plan. Their positions are considered accurate given the provision of a detailed topographical survey. A small number were missed during the land survey and the positions of these have been determined using laser distometers and triangulation calculations.

4.2 All significant trees have been inspected and some of the smaller specimens have been included for accuracy. Individual recommendations are included within Appendix 1 of this report.

4.3 Root Protection Areas (RPAs)

4.3.1 The British Standard Root Protection Areas (RPAs) are indicated by the red circles surrounding the trunk position of the trees on the associated plans. These indicative circles do not take into consideration site specific conditions such as the presence of buildings, roads, footpaths, topography, underground utility services etc. and are representative of typical root morphology where said structures are not encountered.

4.4 Tree Removals

4.4.1 It will be necessary to remove some of the existing trees to facilitate the proposed development and to establish a higher level of arboricultural management for the site:

- Trees 1, 3-7, 9-14
- Groups 3, 6, 7, 8
- Elements of groups 1 and 10

will need to be removed to facilitate the construction of the new buildings and associated infrastructure.

  - Tree 1 – Remove due to conflict with plot 1.
  - Tree 3 – Remove due to direct conflict with plot 1 parking.
  - Tree 4 – Remove due to impact of plot 1 parking on RPA.
  - Tree 5 – Remove due to direct conflict with road.
  - Tree 6 – Remove due to direct conflict with path.
  - Tree 7 – Remove due to impact of path on RPA.
  - Tree 9 – Remove due to impact of road and path on RPA.
  - Tree 10 – Remove due to conflict with road/path and plot 10.
  - Tree 11 – Remove due to conflict with plot 10.
  - Tree 12 – Remove due to direct conflict with plot 10.
  - Tree 13 - Remove due to direct conflict with plot 10.
  - Tree 14 - Remove due to direct conflict with plot 11.
  - Group 1 – This is primarily bramble with 3 young sycamore saplings. Two of the saplings will require removal due to the position of plot 1.

The bramble will be removed due its limited contribution to the scheme. The northern most sapling will be retained.

- Group 3 – Remove due to direct conflict with parking of plot 1
- Group 6 – Remove due to direct conflict with road and path
- Group 7 – This is a ground of leylandii, a number of which have failed completely during storm Arwen. A number of others are leaning with destabilised root plates and their removal will be necessary. Development proposals aside – the group is going to look gappy and aesthetically poor once required health and safety works are completed. Those retained will be vulnerable to windthrow for a few years until they respond to the change in companion shelter with new canopy/root growth. The impact of the development on the RPAs also necessitates removal of this group.
- Group 8 – Remove due to direct conflict with plot 11 garage.
- Group 10 – A small section to the west will require removal due to conflict with the shed of plot 12. The remainder will be retained.

4.4.2 A breakdown of recommended removals, alongside their BS5837 category rating is provided in the table below. For further information regarding the BS5837 quality categorisation system please refer to Appendix 2 (II).

Tree Category Rating	Remove To Facilitate The Development
A – High	-
B – Moderate	Trees 10-14
C – Low	Trees 1, 3, 4, 5-7 & 9 Groups 3, 6, 7 & 8 Elements of groups 1 and 10
U – Unsuitable For Retention	-

4.4.3 The proposed plans indicate a planting scheme will be implemented to complement the proposed development. Careful consideration should be given to all new planting positions to ensure the trees can grow fully into maturity without requiring major or regular pruning works. New specimens should not be positioned in close proximity to buildings, windows or utility services.

4.5 Retained Trees

4.5.1 Protective barriers as per section 5.1 of this report should be erected around all retained trees in the position indicated by the blue line on the Tree Protection Plan prior to any works on site. Signs should also be attached stating that the area is a protected zone and should not be entered.

4.6 Ground Protection Measures

4.6.1 It will be necessary to have access within the root protection areas (RPAs) of some of the trees. To avoid compaction damage to the underlying roots during construction ground protection measures as per section 5.2 of this report will be required in the areas shown as hatched orange on the Tree

Protection Plan (TPP). This methodology should be implemented at the time of barrier erection, remain in situ throughout the build and only removed when all construction activity has finished.

The trees that require ground protection are:

- Groups 2, 9 and 10.

4.7 Ground Level

4.7.1 There must be no alteration of the ground level within the RPA of any retained tree. This includes the lowering of the ground level via the excavation of existing material or the raising of the ground level via the importation of additional material.

4.7.2 Lowering of the ground level results in the inevitable severance of roots. As the majority of feeding roots are located towards the surface of the soil, lowering the ground level by even a few centimetres can have a drastic effect on the trees physiological health, greatly limiting the trees ability to uptake nutrients. A more significant reduction in ground level is likely to sever larger supporting roots resulting in immediate loss of structural integrity, predisposing the tree to failure.

4.7.3 Raising the ground level encourages anaerobic conditions, resulting in reduced gaseous exchange, a necessary part of the respiration process. Water penetration to the underlying root system is also limited. The roots are slowly suffocated leading to decline. Symptoms are likely to include wilting foliage, poor shoot elongation, late bud break, early leaf abscission, crown thinness, followed by dieback and eventually death.

4.7.4 Any level changes, installation of retaining structures etc, should take place outside of the RPA of retained trees.

4.8 Wildlife Habitats

4.8.1 As part of the survey the significant trees were inspected from ground level for signs of wildlife habitation, in particular birds and bats.

Bats

4.8.2 All UK bats and their roosts are protected by law. The legislation protecting bats are:

- The Wildlife & Countryside Act 1981 (WCA)
- Conservation of Habitats and Species Regulations 2017

For all countries of the UK, the legal protection for bats and their roosts may be summarised as follows:

You will be committing a criminal offence if you:

1. Deliberately* capture, injure or kill a bat
2. Intentionally or recklessly disturb a bat in its roost or deliberately disturb a group of bats
3. Damage or destroy a bat roosting place (even if bats are not occupying the roost at the time)
4. Possess or advertise/sell/exchange a bat (dead or alive) or any part of a bat
5. Intentionally or recklessly obstruct access to a bat roost

**In a court, 'deliberately' will probably be interpreted as someone who, although not intending to capture/injure or kill a bat, performed the relevant action, being sufficiently informed and aware of the consequence his/her action will most likely have.)*

4.8.3 Penalties on conviction - the maximum fine is £5,000 per incident or per bat (some roosts contain several hundred bats), up to six months in prison, and forfeiture of items used to commit the offence, e.g. vehicles, plant, machinery.

4.8.4 No visual signs were found to indicate the presence of bats in the surveyed trees though a number of the mature trees within the site display characteristics found favourable to bats and as such caution must be exercised.

4.8.5 When carrying out tree works it is essential that the contractor or other competent person carriers out a specific 'bats in trees risk assessment' which can be obtained from the 'Arboricultural Association' or the 'Bat Conservation Trust' (BCT). If evidence of bats is found work must stop immediately we should be contacted so that our licenced Ecologist can advise further.

Birds

4.8.6 In the UK, all wild birds, their nests and their eggs are protected by law.

In England, Scotland and Wales the legislation that protects wild birds is:

- The Wildlife and Countryside Act 1981
- The Countryside (or CRoW) Act 2000

4.8.7 No nesting birds were present at the time of inspection though signs of past nesting activity were evident and as such caution must be exercised.

4.8.8 As with bats the contractor has an obligation to carry out visual checks prior to works. Where possible tree works should be carried out in the period from August to the end of February in order to avoid the bird nesting season.

5. Tree Protection Measures

5.1 Root Protection Area & Barrier Specification

5.1.1 Trees on development sites are prone to damage during the course of demolition and construction works. Retained trees need to be protected in line with British Standard 5837–2012 Trees in relation to design, demolition & construction.

5.1.2 This usually involves identifying a construction exclusion zone around the tree which should remain undisturbed with appropriate protective barriers preventing access to this Root Protection Area for the duration of the project.

5.1.3 The minimum root protection areas (measured in a radius from the centre of the tree to the protective barrier) are outlined for each individual tree and the barrier layout is indicated on the plan.

5.1.4 The exact root spread of an individual tree is difficult to quantify, but in general, the bulk of a trees roots are situated in the upper 600mm of the soil with the finer absorbing roots prevalent in the upper 250mm.

5.1.5 Dependant on soil conditions and the species of the tree, the root plate may extend radially for distances in excess of the height of the tree.

5.1.6 In the case of development sites, the root protection area is designed to prevent any significant long-term damage to the tree by protecting the root plate and to some extent the lower branches of the tree.

5.1.7 The barriers should be erected prior to work commencing on site and should remain until construction activities have been completed. The root protection area should be considered essential and should not be removed or altered without prior recommendation by an Arboriculturalist and approval of the local planning authority.

5.1.8 The barrier should consist of a vertical and horizontal framework of scaffold tubing which is adequately braced to resist impacts. The vertical scaffold tubes need to be placed at a distance not exceeding 3m apart and driven securely into the ground for a minimum depth of 0.6m. Care should be taken when locating the vertical poles to avoid underground services and, in the case of the bracing poles, also to avoid any structural roots. The weldmesh or Heras panels need to be a minimum 2.0m tall and are securely attached to the scaffold framework with wire or scaffold clamps. The wire or scaffold clamps should be secured on the inside of the barrier to avoid easy dismantling. Panels on rubber or concrete feet are not resistant to impact and should not be used.

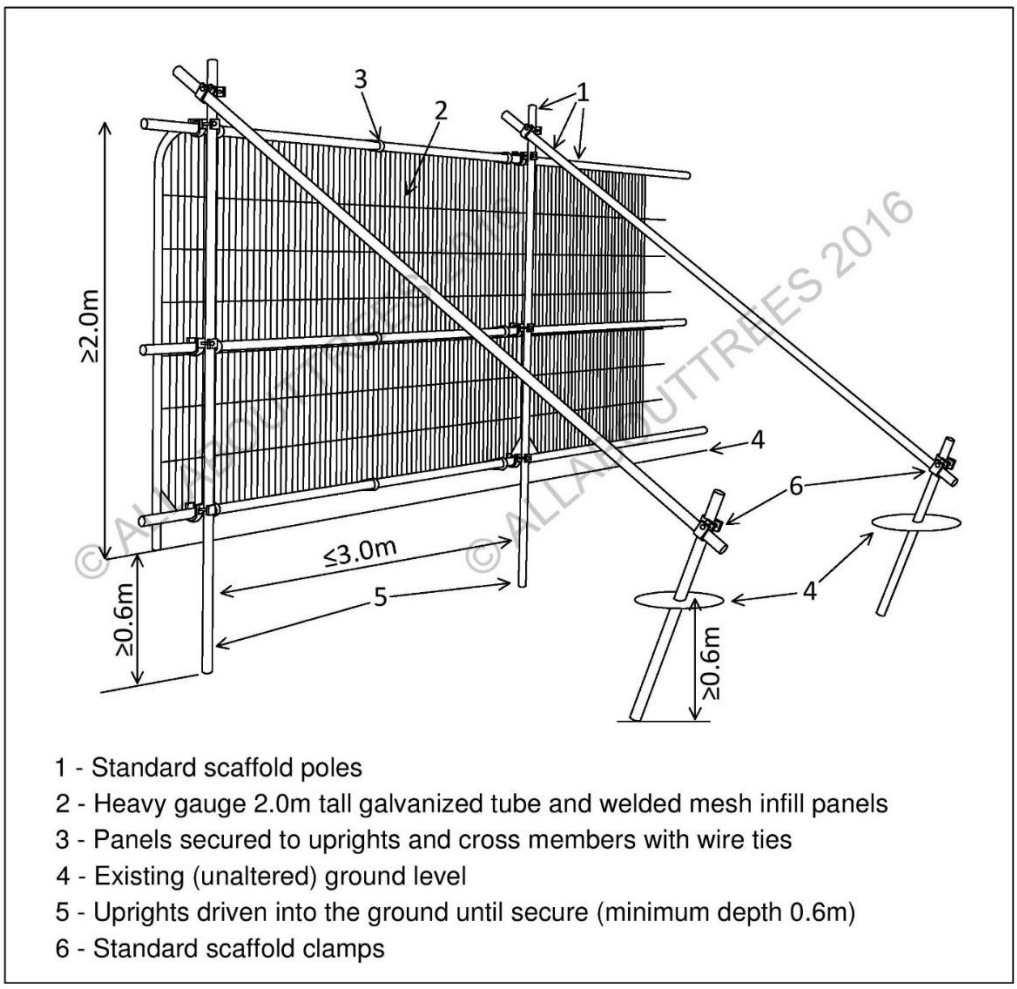

Figure 2 - Protective barrier specification

Figure 3 – An example of a barrier erected on a site

5.1.9 No fixing shall be made to any tree and all possible care must be taken to prevent damage to tree roots when locating the posts.

5.1.10 All types of barriers must be firmly attached to prevent movement by site personnel or vehicles and all-weather signs with the wording "Construction exclusion zone- keep out" should be attached.

5.2 Ground Protection Areas Within Tree's Root Protection Areas

5.2.1 In some cases it will be necessary to provide access within the root protection area of the trees to create space the working areas. To prevent damage occurring to the trees, the following technique should be observed. The areas requiring this protection are marked in hatched orange on the tree protection plan.

5.2.2 The following diagrams visualise the layout requirements. By sufficiently protecting the rootplate of the tree, the access and associated working area can be placed within the root protection area. There is no limitation as to the size of the ground protection area, but we would advise that it is at least 0.5m from the trunk of any tree.

5.2.3 Temporary ground protection should be tailored to the likely load it will be subjected to. The following diagrams indicate the acceptable techniques for:

- Pedestrian
- Plant and vehicle access up to 2 tons gross weight
- Plant and vehicle access up exceeding 2 tons gross weight

Ground Protection Suitable For Pedestrian Movement Only

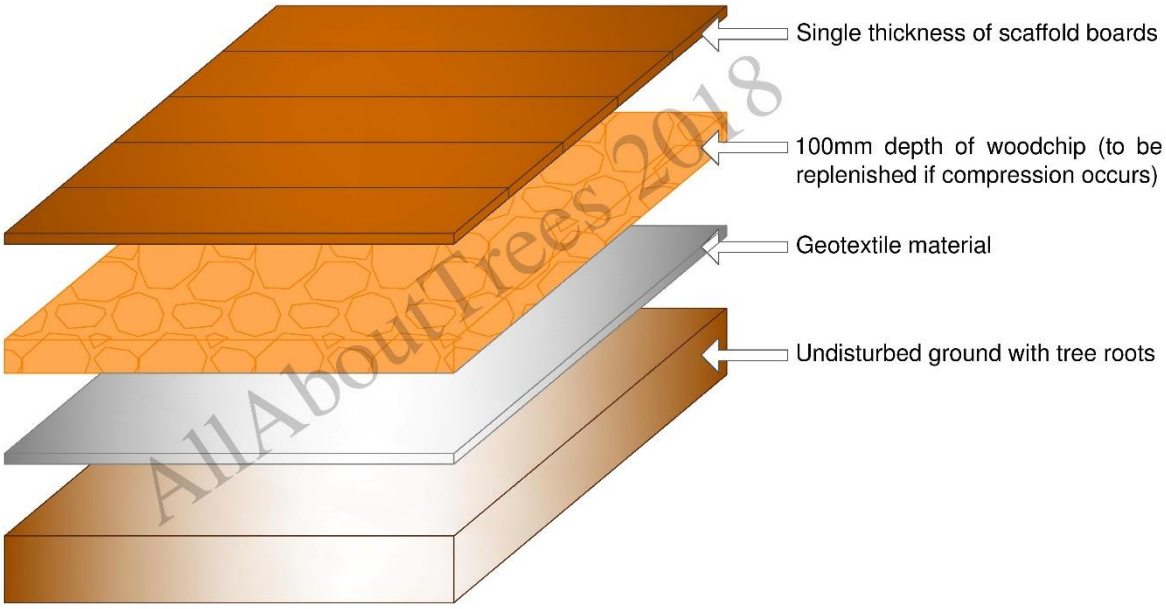

Figure 4

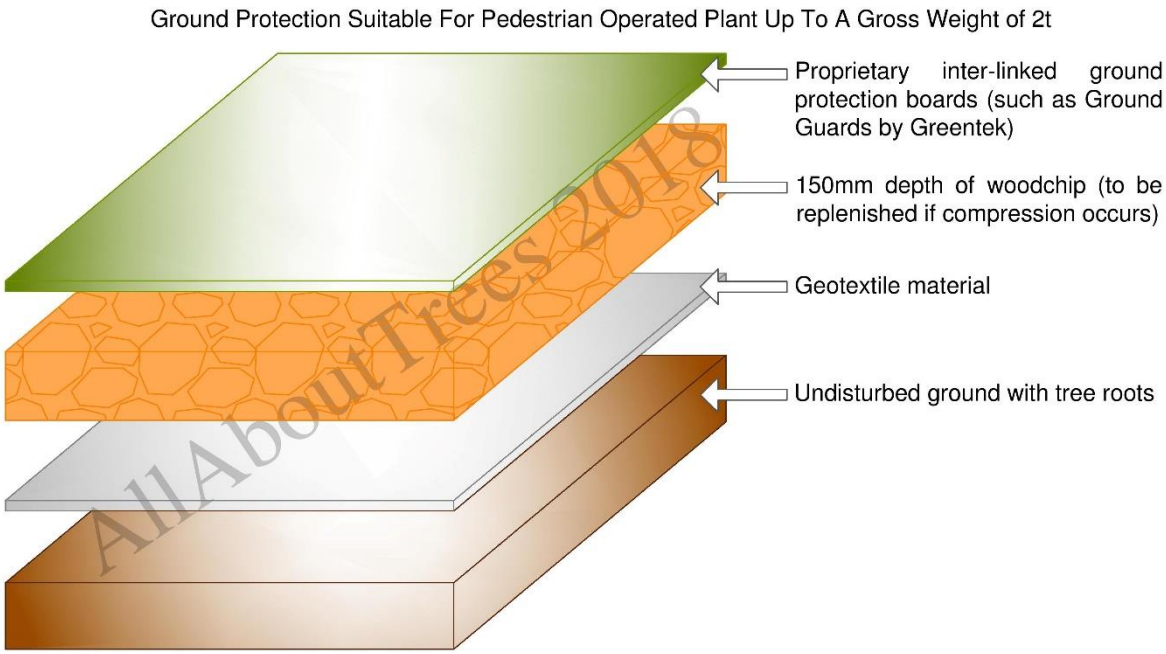

Figure 5

5.2.4 If the likely loading is to exceed 2t gross weight it will be necessary to produce an engineered solution with arboricultural advice to accommodate the likely load safely. One such example is shown below. In some cases, it may be necessary to install a temporary road using a 3D cellular confinement system (such as Cellweb by Geosynthetics Ltd).

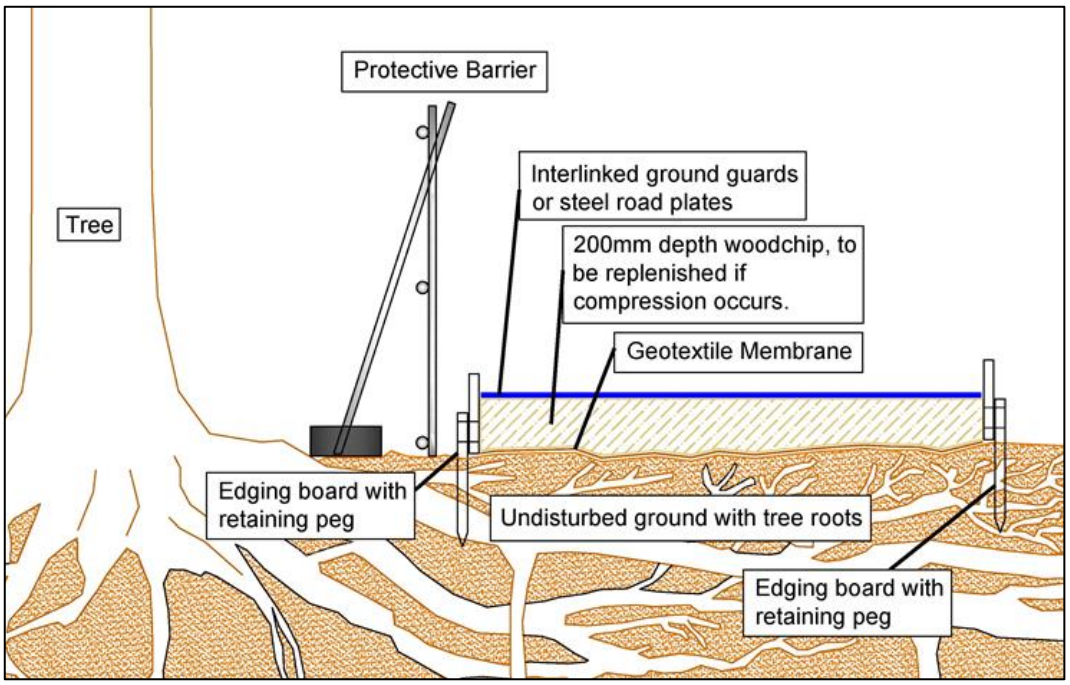

Figure 6

5.3 Service Runs

5.3.1 It is assumed that the existing service runs will be exploited where possible, but if new works are required it is important that they comply with the National Joint Utilities Group (NJUG) 'Guidelines for the planning, installation, and maintenance of utility services in proximity to trees' and BS 5837:2012. The excavation of open trenches by machine will be unacceptable within the protective zone of any of the retained trees.

5.3.2 Acceptable techniques (fuller details in the appendices) for the laying of services in order of preference are:

- **Trenchless-** by using thrust boring or similar techniques
- **Broken Trench-** to be dug by hand
- **Continuous trench-** to be dug by hand

5.3.3 Wherever possible, services should be routed outside of any retained trees RPA. When this is not possible apparatus should be routed together in a common duct and any inspection chambers sited outside the RPA.

5.3.4 When underground apparatus is to pass within the RPA of a retained tree, trenchless insertion methods should be used (see table below) with entry and retrieval pits sited outside the RPA.

5.3.5 Shallow services runs may be dug with hand tools if appropriate and preferably by compressed air soil displacement. Roots, whilst exposed, should immediately be wrapped or covered to prevent desiccation and to protect them from rapid temperature changes. Any wrapping should be removed prior to backfilling, which should take place as soon as possible.

Trenchless Solutions For Installation Of Underground Services					
Method	**Accuracy (MM)**	**Bore (A) diameter (MM)**	**Maximum subterranean length (M)**	**Applications**	**Not suitable for**
Micro tunnelling	<20	100 to 300	40	Gravity-fall pipes, deep apparatus, watercourse/ roadway under crossings	Low-cost projects due to relative expense
Surface-launched directional drilling	≈100	25 to 1200	150	Pressure pipes, cables including fibre optic	Gravity fall pipes, e.g. drains and sewers (B)
Pipe ramming	≈150	150 to 2000	70	Any large-bore pipes and ducts	Rocky and other heavily obstructed soils
Impact moling (C)	≈50 (D)	30 to 180 (E)	40	Gas, water and cable connections, e.g. from street to property	Any application that requires accuracy over distances in excess of 5m.

(A) Dependent upon strata encountered
(B) Pit-launched directional drilling can be used for gravity fall pipes up to 20m in subterranean length
(C) Impact moling (also known as thrust-bore) generally requires soft, cohesive soils.
(D) Substantial inverse relationship between accuracy and distance
(E) Figures given relate to single pass: up to 300mm bore achievable with multiple passes

6. Conclusion

6.1 As with any construction exercise near trees, there are potential areas of conflict where damage could be caused to retained trees.

6.2 By using the protective elements dictated by British Standard 5837, no significant damage should take place during the construction phase and the tree cover should flourish in the longer term.

6.3 It is anticipated that all of the retained trees can be incorporated into the site design; however, it is vital that the ultimate size and spread of the trees should be considered when retaining trees near to the building and that shading and light penetration should also be considered when positioning the windows in the building.

6.4 All tree works must conform rigorously to BS 3998 (2010) 'Tree Work - Recommendations'. The contractors undertaking tree work must comply with the legal obligations to wildlife as outlined in both the AIA and AMS.

For and on behalf of
AllAboutTrees Ltd

Andrew Watson FLS MICFor CBiol MRSB FArborA CEnv LCGI
-Chartered Arboriculturalist & Registered Consultant

Appendix 1

Tree No.	Species Common Name *Latin Name*	Height (M)	Crown Spread (M) N	S	E	W	Trunk Dia (MM)	No. Of Stems	Height Of Lower Canopy (M)	First Sign Branch (M) (Position)	Age	Physiological Condition	Structural Condition	Root Prot Area Radii (M)	Estimated Remaining Contribution (Years)	Tree Quality Assessment	Comments	Maintenance	Bat Roost Potential	Ultimate Size For Species (M) Height	Spread	Priority
1	Hawthorn *Crataegus monogyna*	2.5	1.5	1.5	1.5	1.5	90	1	0.5	0.5 S	Middle aged	Fair	Fair	1.1	10+	C - Low	Beginning to include mesh fence.	This tree is in conflict with the design proposals and will need to be removed to facilitate the development.	None	10	7	A
2	Sycamore *Acer pseudoplatanus*	7.5	1.5	2.5	2	1.5	140	1	1	2 N	Middle aged	Fair	Fair	1.7	40+	C - Low	Asymmetric crown spread. Mesh fence included at base.	This tree is retainable and will be adequately protected by the position of the protective barrier as indicated by the blue line on the TPP. Clip metal free of stem as far as possible.	None	22	14	B
3	Elder *Sambucus nigra*	5	0	4	1	2	170	1	1.5	2.5 S	Mature	Fair	Fair	2	10+	C - Low	Located in the neighbouring property outside the site boundary. Remote assessment, some dimensions estimated. Deadwood. Asymmetric crown spread; canopy distorted due to group pressure.	This tree is in conflict with the design proposals and will need to be removed to facilitate the development.	None	8	6	A
4	Elder *Sambucus nigra*	6	1.5	3.5	3	2	250	1	1	2 SE	Mature	Fair	Fair	3	10+	C - Low	Located in the neighbouring property outside the site boundary.	This tree is in conflict with the design proposals and will need to be removed to facilitate the development.	None	10	7	A

Tree No.	Species Common Name *Latin Name*	Height (M)	Crown Spread (M) N	 S	 E	 W	Trunk Dia (MM)	No. Of Stems	Height Of Lower Canopy (M)	First Sign Branch (M) (Position)	Age	Physiol-ogical Condition	Structural Condition	Root Prot Area Radii (M)	Estimated Remaining Contribution (Years)	Tree Quality Assessment	Comments	Maintenance	Bat Roost Potential	Ultimate Size For Species (M) Height	 Spread	Priority
																	Remote assessment, some dimensions estimated. Stem diameter estimated as a single value. Multiple stems from ground level. Broken / hanging branches in crown. Deadwood. Crown distorted due to group pressure.					
5	Wild Cherry *Prunus avium*	8	1	3	2	2.5	130	1	1.5	2 S	Middle aged	Fair	Fair	1.6	40+	C - Low	No major visible defects. Crown distorted due to group pressure.	This tree is in conflict with the design proposals and will need to be removed to facilitate the development.	None	17	10	A
6	Wild Cherry *Prunus avium*	8	1	2.5	2.5	1	110	1	3	3 S	Young	Fair	Fair	1.3	40+	C - Low	No major visible defects. Crown distorted due to group pressure.	This tree is in conflict with the design proposals and will need to be removed to facilitate the development.	None	17	10	A
7	Elder *Sambucus nigra*	4	0.5	2.5	2	2.5	180	1	0	0.5 SW	Mature	Fair	Fair	2.2	10+	C - Low	Stem diameter estimated as a single value. Multiple stems from ground level. Broken / hanging branches in crown.	This tree is in conflict with the design proposals and will need to be removed to facilitate the development.	None	8	6	A

Tree No.	Species Common Name *Latin Name*	Height (M)	Crown Spread (M) N	 S	 E	 W	Trunk Dia (MM)	No. Of Stems	Height Of Lower Canopy (M)	First Sign Branch (M) (Position)	Age	Physiol-ogical Condition	Structural Condition	Root Prot Area Radii (M)	Estimated Remaining Contribution (Years)	Tree Quality Assessment	Comments	Maintenance	Bat Roost Potential	Ultimate Size For Species (M) Height	 Spread	Priority
																	Minor/small diameter deadwood retained in canopy. Metal fence included in stems. Messy looking.					
8	Elder *Sambucus nigra*	5	2	2	2	2.5	220	3	0.5	1 SE	Middle aged	Fair	Fair	2.6	10+	C - Low	Multiple stems from ground level. Abuts fence.	This tree is retainable and will be adequately protected by the position of the protective barrier as indicated by the blue line on the TPP. No tree works required at the present time.	None	10	6	-
9	Ash *Fraxinus excelsior*	10	5	5.5	6	5.5	600	1	2	2.5 SW	Middle aged	Fair	Fair	7.2	10+	C - Low	Some dimensions estimated due to access constraints. Multiple stems from ground level. No sign of ash dieback at present time though likely to become apparent in coming years. Broken / hanging branches in crown. Deadwood. Regenerative growth from coppiced stool.	This tree is in conflict with the design proposals and will need to be removed to facilitate the development.	None	23	15	A
10	Cider Gum	11	2.5	4.5	7.5	3	383	3	0.5	1 SW	Middle aged	Fair	Fair	4.6	20+	B - Moderate	Multiple stems from ground level.	This tree is in conflict with the design	None	18	11	A

Tree No.	Species Common Name *Latin Name*	Height (M)	Crown Spread (M) N	 S	 E	 W	Trunk Dia (MM)	No. Of Stems	Height Of Lower Canopy (M)	First Sign Branch (M) (Position)	Age	Physiol-ogical Condition	Structural Condition	Root Prot Area Radii (M)	Estimated Remaining Contribution (Years)	Tree Quality Assessment	Comments	Maintenance	Bat Roost Potential	Ultimate Size For Species (M) Height	 Spread	Priority
	Eucalyptus gunnii																Asymmetric crown spread. Tear wounds in canopy.	proposals and will need to be removed to facilitate the development.				
11	Cider Gum *Eucalyptus gunnii*	13	2.5	2.5	4	3.5	340	1	0.5	2 SE	Middle aged	Fair	Fair	4.1	20+	B - Moderate	Broken / hanging branches in crown. Crown distorted due to group pressure.	This tree is in conflict with the design proposals and will need to be removed to facilitate the development.	None	18	10	A
12	Cider Gum *Eucalyptus gunnii*	10	3	1.5	3.5	1	197	2	2	2.5 SE	Middle aged	Fair	Fair	2.4	20+	B - Moderate	Stem divides below 1.5m. Crown distorted due to group pressure.	This tree is in conflict with the design proposals and will need to be removed to facilitate the development.	None	18	9	A
13	Cider Gum *Eucalyptus gunnii*	13	3	1.5	4	0	250	1	2	2.5 E	Middle aged	Fair	Fair	3	20+	B - Moderate	Leans to the northeast. Broken / hanging branches in crown. Crown distorted due to group pressure.	This tree is in conflict with the design proposals and will need to be removed to facilitate the development.	None	18	8	A
14	Horse Chestnut *Aesculus hippocastanum*	6	3	3	3.5	2	200	1	1	1 W	Middle aged	Fair	Fair	2.4	40+	B - Moderate	No major visible defects.	This tree is in conflict with the design proposals and will need to be removed to facilitate the development.	None	20	16	A
Tree Groups																						
1	Sycamore *Acer pseudoplatanus*	3.5	-	-	-	-	60	1	-	-	Young	Fair	Fair	0.7	40+	C - Low	3x young sycamore growing among bramble scrub.	Part of this group is in conflict with the proposed design and will need to be removed to facilitate the development. The remainder is retainable and will be	None	22	20	A

Tree No.	Species Common Name *Latin Name*	Height (M)	Crown Spread (M) N	 S	 E	 W	Trunk Dia (MM)	No. Of Stems	Height Of Lower Canopy (M)	First Sign Branch (M) (Position)	Age	Physiol-ogical Condition	Structural Condition	Root Prot Area Radii (M)	Estimated Remaining Contribution (Years)	Tree Quality Assessment	Comments	Maintenance	Bat Roost Potential	Ultimate Size For Species (M) Height	 Spread	Priority
																		adequately protected by the position of the protective barrier as indicated by the blue line on the TPP. Remove all bramble and 2x southern most saplings. Retain 1x sycamore sapling.				
2	Elder Hawthorn *Sambucus nigra, Crataegus monogyna*	6	-	-	-	-	180	1	-	-	Mature	Fair	Fair	2.2	20+	C - Low	Located in the neighbouring property outside the site boundary. Remote assessment, some dimensions estimated. Broken / hanging branches in crown. Deadwood. Unmanaged hedgerow allowed to grow into small row of trees. Oversailing into site.	This group is retainable and will be adequately protected by the position of the protective barrier as indicated by the blue line on the TPP. Design encroaches on RPA. Ground protection measures required in the area indicated by the orange hatching. Crown clean to remove the deadwood. Remove broken / hanging branches. Crown lift to 3.0m over parking bays. Replant gaps.	None	10	8	B
3	Lilac	6	-	-	-	-	150	1	-	-	Middle aged	Fair	Fair	1.8	20+	C - Low	Located in the neighbouring property outside the site boundary.	This group is in conflict with the design proposals and	None	8	8	A

Tree No.	Species Common Name *Latin Name*	Height (M)	Crown Spread (M) N	 S	 E	 W	Trunk Dia (MM)	No. Of Stems	Height Of Lower Canopy (M)	First Sign Branch (M) (Position)	Age	Physiological Condition	Structural Condition	Root Prot Area Radii (M)	Estimated Remaining Contribution (Years)	Tree Quality Assessment	Comments	Maintenance	Bat Roost Potential	Ultimate Size For Species (M) Height	 Spread	Priority
	Syringae vulgaris																Remote assessment, some dimensions estimated. Unmanaged cluster of trees, leaning into site. Fair oversail.	will need to be removed to facilitate the development.				
4	Wild Cherry *Prunus avium*	9.5	-	-	-	-	350	1	-	-	Middle aged	Fair	Fair	4.2	40+	B - Moderate	Located in the neighbouring property outside the site boundary. Remote assessment, some dimensions estimated. 2x trees. Approximately 3.5m from boundary fence. Slight oversail into site.	This group is retainable and will be adequately protected by the position of the protective barrier as indicated by the blue line on the TPP. No tree works required at the present time.	None	17	16	-
5	Elder Hawthorn *Sambucus nigra, Crataegus monogyna*	4	-	-	-	-	150	1	-	-	Mature	Fair	Fair	1.8	20+	C - Low	Located in the neighbouring property outside the site boundary. Remote assessment, some dimensions estimated. Old unmanaged hedgerow. Minor oversail into site.	This group is retainable and will be adequately protected by the position of the protective barrier as indicated by the blue line on the TPP. No tree works required at the present time.	None	10	8	-
6	Elder Hawthorn *Sambucus nigra, Crataegus monogyna*	5	-	-	-	-	200	1	-	-	Mature	Fair	Fair	2.4	10+	C - Low	Broken / hanging branches in crown. Deadwood.	This group is in conflict with the design proposals and will need to be	None	10	8	A

Tree No.	Species Common Name *Latin Name*	Height (M)	Crown Spread (M) N	 S	 E	 W	Trunk Dia (MM)	No. Of Stems	Height Of Lower Canopy (M)	First Sign Branch (M) (Position)	Age	Physiological Condition	Structural Condition	Root Prot Area Radii (M)	Estimated Remaining Contribution (Years)	Tree Quality Assessment	Comments	Maintenance	Bat Roost Potential	Ultimate Size For Species (M) Height	 Spread	Priority
																	Old unmanaged hedgerow. Messy and overgrown.	removed to facilitate the development.				
7	Leyland Cypress *X Cupressocyparis leylandii*	12	-	-	-	-	300	1	-	-	Middle aged	Fair	Poor	3.6	10+	C - Low	Group located on site boundary. Affected by storm with number of complete and partial failures evident. Group will be patchy and aesthetically poor once made safe. Retained individuals will be somewhat exposed and liable to further failure.	This group is in conflict with the design proposals and will need to be removed to facilitate the development.	None	18	6	A
8	Cherry Plum Elder *Prunus cerasifera, Sambucus nigra*	6.5	-	-	-	-	180	1	-	-	Middle aged	Fair	Fair	2.2	20+	C - Low	Deadwood. Crossing / rubbing branches. Unmanaged scrub trees.	This group is in conflict with the design proposals and will need to be removed to facilitate the development.	None	12	8	A
9	Lawson Cypress *Chamaecyparis lawsoniana*	9	-	-	-	-	180	1	-	-	Middle aged	Fair	Fair	2.2	20+	B - Moderate	Linear group on site boundary. Western individual partially collapsed.	This group is retainable and will be adequately protected by the position of the protective barrier as indicated by the blue line on the TPP. Ground protection measures required in the area indicated by the orange hatching. Remove damaged tree from west extremity of group.	None	18	6	B

Tree No.	Species Common Name *Latin Name*	Height (M)	Crown Spread (M) N	 S	 E	 W	Trunk Dia (MM)	No. Of Stems	Height Of Lower Canopy (M)	First Sign Branch (M) (Position)	Age	Physiol-ogical Condition	Structural Condition	Root Prot Area Radii (M)	Estimated Remaining Contribution (Years)	Tree Quality Assessment	Comments	Maintenance	Bat Roost Potential	Ultimate Size For Species (M) Height	 Spread	Priority
10	Elder *Sambucus nigra*	6	-	-	-	-	150	1	-	-	Middle aged	Fair	Fair	1.8	20+	C - Low	Multiple stems from ground level. Minor/small diameter deadwood retained in canopy. Unmanaged scrub trees on site boundary.	Part of this group is in conflict with the proposed design and will need to be removed to facilitate the development. The remainder is retainable and will be adequately protected by the position of the protective barrier as indicated by the blue line on the TPP. Ground protection measures required in the area indicated by the orange hatching. Crown lift to 2.5m to improve usable garden space.	None	10	8	A

Appendix 2(1)

Glossary of Terms

1	**Reference number:**	An individual identifying number
2	**Species:**	Species identification is based on visual field observations and lists the common name. In some cases, the botanical name will be used where there is no common alternative. On in-depth surveys the botanical name only may be used
3	**Height:**	Height is estimated to the nearest metre. On computerised surveys this may be within a range of heights. When measured height is required, a clinometer is used to measure to the nearest metre
4	**Diameter:**	Trunk diameter measured at 1.5 metres from ground level and recorded in millimetres. In some surveys this is indicated as a range
5	**Spread:**	Measurement of canopy from the trunk to the nearest metre in four directions, North, South, East, and West in metres
6	**Lower crown Clearance:**	Height in metres of crown clearance above adjacent ground level
7	**Age:**	Either an estimate (or statement if accurately known) of the age of the tree, classified as:
	Y	= Young tree, established tree usually up to one third of expected ultimate height & spread
	MA	= middle aged, usually between one third and two thirds of ultimate height & spread
	M	= Mature, more or less at full height but still increasing in girth & spread
	OM	= Over mature, grown to full size and becoming senescent,
	V	= Veteran tree, individuals surviving beyond the typical age range for the species
8	**Physiological Condition:**	Good = Healthy tree with good vitality, Fair = Moderate health and vitality normal or slightly less for species and age Poor = Poor shape or form - signs of decline in crown, may have structural weakness. Dead = dead or dying tree
9	**Structural Condition:**	Good = No visible structural defects Fair = Only minor structural defects Poor = Defects which may need to be rectified or regularly monitored Remove = Severe defects which may result in immanent failure or collapse
10	**Management Recommendations:**	General comments on the condition of the tree or group and any action required. potential for wildlife habitats
11	**Estimated Remaining Contribution:**	Safe Useful Life Expectancy (SULE): in some cases the age ranges are modified Short: 0 – 10years Medium: 10– 20 Years Intermediate: 20-40 Long: 40 + years
12	**Tree Quality:**	Assessment of tree quality see following cascade chart for details
13	**Priority:**	A - Works to achieve an acceptable level of safety or required to facilitate the development B - Works to achieve higher levels of arboricultural management. C - To improve the aesthetic appearance.
14	**Ultimate Size:**	Based on site specific features and the individual specimen in its surroundings. Measured to nearest metre (m)
15	**Root Protection Area:**	The distance at which the protective barrier should be erected measured in a radii from the centre of the trunk in metres.
16	**Pruning:**	Pruning shall be defined as the removal of living or dead parts of a plant by the Contractor. Such parts may be soft growth, twigs, branches, limbs or sections of the tree trunk. The cut material may vary from small to large in size.

17 Crown Cleaning: Cleaning out is defined as the removal of dead, dying or diseased branchwood, broken branches or stubs left from previous tree surgery operations (see also 16 Deadwooding) together with all unwanted objects, which may include ivy (if specified) and/or other climbing plants, nails, redundant cable bracing, rope swings, tree houses and windblown rubbish from the tree, and any such debris from any cavities within the tree.

18 Deadwood Removal: Dead-wooding shall be defined as the removal of all dead and dying branches and limbs from the tree.

19 Crown Lifting: Crown lifting shall be defined as the removal of all soft growth and branches or parts thereof which are below or which extend below the height specified in the tender documents. It is recognised that the resultant canopy base might not be one single level but might be stepped to allow for different clearances, for example where a tree overhangs both the footway and the road where different height clearances are required.

20 Crown Reduction: Crown reduction shall be defined as the reduction of the complete outline dimension of the canopy, from the tips of limbs and branches to the main trunk, by pruning growth to an acceptable branch, twig or but to leave a flowing silhouette.

Appendix 2(11) Cascade Chart For Assessing Tree Quality

Category and definition Trees to be considered for retention	Criteria – Subcategories 1. Mainly arboricultural values	2. Mainly landscape values	3. Mainly cultural values, including conservation	Identification on plan
Category High = A **Trees of high quality** with an estimated remaining life expectancy of at least 40 years	Trees that are particularly good examples of their species, especially, if rare or unusual, or those that are 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 of particular visual importance as arboricultural and/or landscape features	Trees, groups or woodlands of significant conservation historical, commemorative or other value (e.g. veteran trees or wood – pasture)	Green
Category Moderate = B **Trees of moderate quality** with an estimated remaining life expectancy of at least 20 years	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation	Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality	Trees with material conservation or other cultural value	Blue
Category Low = C **Trees of low quality** with an estimated remaining life expectancy of at least 10 years; or young trees with a stem diameter below 150mm	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value, and/ or trees offering low or only temporary/transient landscape benefits	Trees with no material conservation or other cultural benefits	Yellow
	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 150mm should be considered for relocation			
Category = U Trees unsuitable for retention Those of such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years	• 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 U 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 • Habitat reinstatement may be appropriate (e.g. U category trees used as a bat roost- installation of bat box in nearby tree)			Red

Appendix 2(111)
Guidelines for the Planning, installation and Maintenance of utility services in proximity to trees- Based on information from National Joint Utilities Group (NJUG)

Ideally all services should be placed outside of the trees root protection area, but in some situations this is not feasible due to the confines of the site. If services must be laid within the root protection area acceptable techniques are detailed below in order of preference.

- **Trenchless-** by use of thrust boring or similar techniques. The pit excavations for starting and receiving the machinery should be located outside of the root protection area.
  To avoid root damage, the mole should run at a depth of at least 600mm.
  Use of external lubricants on the mole other than water (e.g. oil or bentonite) should be avoided.
- **Broken trench-** by using hand dug trench sections together with trenchless techniques. It should be limited to practical access and installation around or below the roots. The trench must be dug by hand (see following comments re continuous trenching) and only be long enough to allow access for linking to the next section. The open sections should be kept as short as possible.
- **Continuous trench-** the trench is excavated by hand and retains as many roots as possible. The surface layer is removed carefully and hand digging of the trench takes place. No roots over 2.5cm diameter or clumps of smaller roots (including fibrous) should be severed. The bark surrounding the roots must be maintained. Cutting of roots over 2.5cm diameter should not be attempted without the advice of a qualified Arboriculturalist.
  If roots have to be cut, a sharp tool (defined as spade, narrow spade, fork, breaker bar, secateurs, handsaw, post hole shoveller, hand trowel) should be used.

Backfilling

Reinstatement of street works must comply with the code of practice New Roads and Streetworks Act 1991 (Specification for the reinstatement of openings in highways), but where tree roots are involved backfilling should be carefully carried out to avoid direct damage to retained roots and excessive compaction of the soil around them.

The backfill should incorporate an inert granular material mixed with top soil or sharp sand (not builders sand) around the retained roots. This will allow a measure of compaction for resurfacing whilst creating an aerated zone around the roots.

Roots and in particular fine roots, are vulnerable to desiccation on exposure to air. The roots are at greatest risk when there are rapid fluctuations in the air temperature around them (especially winter diurnal temperatures). It is vitally important that the roots are covered with sacking whilst the trench is open. The sacking should be removed once the trench is backfilled.

Planning of services

When laying new or replacement services it is wise to plan ahead to prevent future direct damage to the services from root growth by placing the services within a duct.

If roots have grown into a drain or duct and proliferated to cause a blockage, removal of the root mass will only have a temporary affect and the root will regrow. The fault is in the pipe or duct, not the tree roots and the only answer is to repair or replace the damaged area. Particular problems occur with old salt glazed pipes where clay has been used to seal the joints and has subsequently dried out leaving a gap for the roots to infiltrate.

A popular myth has arisen that tree roots are attracted to water or nutrients within piped systems, this is not so. Roots are adventitious and grow in all directions proliferating in areas where moisture or nutrients are present. They tend to grow near to the pipe to make use of the condensation or moisture build up on the outside of the pipe but will enter the pipe through any crack or damaged joint. They are not capable of breaking into sound pipes.

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