ASDA

Barnsley

BS5837 Tree Survey

This Report has been Prepared under the Framework of BS ISO 9001
Approved for issue: Date:

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1 Introduction

1.1 RPS were instructed, in February 2009, by ASDA Stores Ltd to undertake a Tree Survey in relation to proposed development of land at ASDA, Old Mill Lane, Barnsley.

1.2 The purpose of the report is to:

- Record the current condition of the trees found on the site and categorise them using criteria outlined in BS5837 - Trees in Relation to Construction- Recommendations 2005.
- Provide a Tree Constraints Plan that identifies any constraints to development presented by the trees to include root protection areas for the retained trees as described in BS5837 - Trees in Relation to Construction.
- Provide baseline information with regards the tree stock currently present on the site to assist in the preparation of specific Arboricultural Implications Assessments relating to the proposed development.

1.3 The survey was carried out by Edmund Lusk, holder of the HND in Arboriculture and Professional Member of the Arboricultural Association, of the RPS Group PLC.

2 Site Information

2.1 The trees surveyed are located on land at the ASDA store, Old Mill Lane, Barnsley.

2.2 The site is located to the north of Barnsley town centre and is within the Barnsley Metropolitan Borough Council administrative area.

2.3 The site is centred on Ordnance Survey Grid Reference SE 3489 0722 and is of approximately 3.5ha in size.

2.4 The site is currently set out to the existing ASDA store and its associated car-parking areas. In addition there are a retail food outlet and a petrol filling station to the south of the site.

2.5 The site is situated to the north of Old Mill Lane with pedestrian and vehicular access and egress points provided into the site along this boundary.

2.6 The site has further boundaries with The Fleets Dam section of The River Dearne to the east and north-east, with amenity space and residential development to the north-west and new housing to the west.

2.7 A public footpath runs adjacent to the western boundary of the site linking Old Mill Lane to the south with residential development at Honeywell Place to the north.

2.8 The site extends to include a small parcel of land known as the keel land to the south-west, this are is currently undeveloped and set out to amenity grass and trees. The public footpath runs to the eastern boundary of this plot of land.

2.9 There is some limited tree planting within the central developed area of the site however predominantly trees are located to the sites boundaries.

2.10 Due to the nature of the site there are a number of areas where tree root development will have been influenced or limited; in particular retaining walls and sealed hard surfaces are likely to have acted as effective barriers to root growth.

3 Tree Quality Assessment

3.1 All trees inspected were categorised using BS5837:2005 and the attached plan (Figure 1) shows tree positions, numbers and retention categories.

3.2 The initial stage of a tree survey in accordance to BS 5837:2005 looks at the trees on the site in terms of life expectancy and condition.

3.3 Trees are then categorised according to their retention value; category A trees have a high retention value, category B trees have a moderate retention value, category C trees are those of a low retention value which can be retained in the short term and category R trees are those believed to warrant removal as they are likely to fail or die within 10 years. Please refer to Appendix 2 for more detailed definitions of the categories.

3.4 Category A, B or C trees are those that should be a material consideration in the planning process whilst category R trees are those which would be lost in the short term for reasons connected to their physiological or structural condition and hence should not be a consideration in the planning process.

3.5 **BS5837 Categories**

Category A Trees – High Retention Value

3.5.1 No trees on site where assessed as being of category A value when considered in accordance with BS5837:2005.

3.5.2 However it should be noted that several trees currently considered to be of a moderate, category B, retention value or of a low, category C, retention value do have potential to develop into category A specimens as they mature.

3.5.3 In particular the six middle-aged Norway Maple trees located to the south-west of the site on the Keel land do have the potential to develop into specimens of good form and high landscape value. It should be noted however that currently soil compaction as a result of pedestrian passage was evident around these trees and this will affect their long term vitality.

Category B Trees – Moderate Retention Value

3.5.4 42% of the trees surveyed were assessed as being of category B value when considered in accordance with BS5837:2005.

3.5.5 These are trees of a moderate retention value which are in such a condition that they can make a continuing contribution to the landscape character of the site.

3.5.6 The trees considered to be of a moderate retention value have been assessed as meeting both the category B1, mainly arboricultural values, and the B2, mainly landscape values, BS5837 sub-category criteria.

3.5.7 Typically trees have been classified as being of B1 value where they are reasonable examples of their species, of good form and with only minor or remediable defects notable. Whilst many of these specimens are situated within groups of similar trees it is considered that they could be retained on an individual basis and their value is not derived primarily as a result of their forming part of a group landscape feature.

3.5.8 Where classified as B2 value it is acknowledged that the trees are primarily of value as a result of their forming part of a group. Several specimens considered to meet the B2 sub-category criteria are of a compromised form or have defects which are considered to reduce their individual merit but when considered as part of a wider group feature they are of a moderate value.

3.5.9 Trees included within this category include several which, subject to appropriate management, have the potential to develop into category A specimens of a high retention value. In particular six Norway Maples (T72, 73, 74, 77, 78, 79) located on the Keel land to the south-west of the site.

Category C Trees – Low Retention Value

3.5.10 The majority of trees surveyed, 47%, were classified as being of category C value when considered in accordance with BS5837:2005.

3.5.11 These specimens are of a low retention value and whilst they may be retainable in the short term they should not necessarily be viewed as a constraint to development. (Ref: BS5837:2005 Table 1)

3.5.12 Trees have been considered to meet the criteria for inclusion within this category for two primary reasons.

3.5.13 Firstly young trees, i.e. those with a stem diameter of less than 150mm at 1.5m above ground level or of an equivalent overall size where they are multi-stemmed below this point, are considered to be of category C value as they currently make little contribution to the local landscape and their loss could be mitigated for by appropriate replacement planting following development.

3.5.14 Secondly trees have been included within the C category as they are not considered to meet the criteria for categorisation within either the A or B categories. This may be due to declining physiological condition and limited life expectancy, due to limited landscape contribution or due to very poor structural condition.

3.5.15 The majority of trees classified as being of category C value, approximately two thirds of the total number, have been included within the category for the first reason set out above.

3.5.16 It should be noted that these trees may have significant future potential and as such they should be considered for retention where possible.

Category R Trees – No Retention Value

3.5.17 Finally 11% of the overall number of individual trees surveyed were considered to be of category R value when considered in accordance with BS5837.

3.5.18 Trees assessed as being of category R value are those likely to die or become dangerous within a period of ten years irrespective of any development proposal. As such they are not considered to be a material consideration in the planning process.

3.5.19 Whilst it may, in cases, be desirable to retain R category trees within a development (e.g. to provide deadwood habitat) they must not be viewed as a constraint to development and if they are to be retained consideration for access, working space etc must be given with respect to the future need to remove such trees.

3.5.20 The trees within this category include those which are in physiological decline to the extent that they are expected to die within a period of 10 years and those, which due to major structural defects, are expected to collapse within a period of 10 years.

3.6 Physiological Condition

3.6.1 A high number of the trees surveyed, 43%, were considered to be in a good physiological condition with crown density and shoot extension growth levels within the expected ranges for their age and species.

3.6.2 Trees assessed as being in a good physiological condition are more likely to tolerate changes within their growing environment that occur as a result of development; as such their successful retention will be easier to achieve.

3.6.3 A further 49% of the trees surveyed were assessed as being of a fair physiological condition. Typically these specimens are exhibiting lower shoot extension growth and reduced crown density than would typically be expected.

3.6.4 These specimens have a lower life expectancy than those within the good condition class and will not tolerate significant changes as a result of development as well as those in the good condition class.

3.6.5 Six trees, representing approximately 6% of the overall number, were considered to be of a poor physiological condition and two trees were physiologically dead.

3.6.6 These trees are not in a condition whereby they are likely to make a lasting contribution to the site and have generally been classified as, trees of no retention value, category R specimens.

3.6.7 The physiological condition of several trees on site has been influenced significantly by site specific factors. In particular it was noted that T91 – T104 are set within an area of impermeable concrete surfacing with few areas where moisture infiltration and gaseous exchange can occur. This has resulted in visible decline in a number of the trees and it is considered that these specimens have little life expectancy in the current situation.

3.7 Structural Condition

3.7.1 There are variations in the structural condition of the trees surveyed however individual tree condition is largely consistent with expectations for the age, management and species of the tree.

3.7.2 Generally the structural condition of the trees surveyed was fair to good with no significant defects likely to result in the catastrophic premature failure of trees stems or primary branches in the short term noted in the majority.

3.7.3 Primarily insignificant defects such as small quantities of minor deadwood within the crowns of trees were most recorded on the site.

3.7.4 However several trees did have defects which, whilst inconsequential to their stability at this time, will require continued monitoring, assessment and management. In particular a number of trees were noted to have included bark present between stem or branch unions, this results in an inherently weak union and renders the affected specimens liable to premature failure.

3.7.5 Additionally a few of the trees were noted to have significant structural defects which are likely to result in the catastrophic premature failure of those trees.

3.7.6 In particular it was noted that several trees located on the embankments to the site boundaries had suffered partial root plate failure. Additionally several of the Birch trees, also located on the embankments to the site boundaries, were noted to be host to the decay fungus and pathogen *Piptoporus betulinus* which will result in their death and eventual failure.

3.8 Species and Age Distribution

3.8.1 A schedule of the tree species recorded within the survey is included in this report as Appendix 3.

3.8.2 The majority of trees surveyed, 43%, were considered to be of a maturing / middle aged age class. These trees generally have significant future growth potential and have not yet reached their maximum expected size for the location.

3.8.3 The remaining trees considered were either assessed as being mature (19%), over mature (3%) or young (35%).

3.8.4 Mature trees have some future growth potential but significant increases in height or spread are not considered likely. Over-mature trees have achieved the maximum expected size for the situation. Young trees, as with maturing trees, have the potential to significantly and rapidly increase in size and this must be considered in the design of the site.

3.9 Tree Groups

3.9.1 In addition to the individual trees fifteen tree groups were considered during the survey.

3.9.2 Trees have been surveyed as groups where they can be considered as forming a group as they form cohesive features either aerodynamically (i.e. they form a discrete group feature providing companion), culturally (i.e. they are composed of trees of a similar size, age and species subject to the same management) or visually (i.e. where the value of the trees within the group is as a whole rather than individually).

3.9.3 Where trees have been surveyed as groups the details recorded intend to represent an average tree within the group; however on occasion it must be noted that there will be exceptions within the group that do not conform to the typical character of trees within the group. Where this occurs a note has been made within the written schedule for the group and where possible the trees have been shown with Root Protection Areas based on individual, rather than average, diameter on the Tree Constraints Plan (Figure 1).

3.9.4 Of the tree groups surveyed the majority (eight) were considered to be of category C value when assessed in accordance with BS5837 this was primarily due to their being composed of young trees with stem diameters of under 150mm at 1.5m above ground level. These groups are of a low retention value.

3.9.5 The remaining seven tree groups were assessed as being of category B value when considered in accordance with BS5837:2005. These groups are of a moderate retention value.

3.10 Ecological Value

3.10.1 Generally speaking it is known that trees are of ecological value and that they fulfil an important role in the urban landscape. In particular it should be noted that trees may provide habitat for protected species, notably for birds and bats.

4 Design Approach to Arboricultural Issues

Tree Retention / Removal

4.1 The prioritisation for tree retention should be based upon the guidance contained within BS5837:2005. Category A trees should be seen as the highest priority for retention and category C the lowest.

4.2 When considering the extent of tree retention on site with respect to category C trees priority should be given to the trees that have been included within this category due to their having stem diameters of less than 150mm at 1.5m above ground level, as these specimens are relatively young trees with future potential.

4.3 The retention of trees forming groups, particularly where they are situated to the site boundaries and are therefore of relative visual prominence within the local landscape, is recommended.

4.4 All trees that have been included within the R category are recommended for removal prior to development due to their poor condition.

Design Considerations

4.5 To ensure that the trees selected for retention can be successfully integrated within the proposed development the following factors should be considered.

Future Tree Growth

4.6 Some of the trees surveyed are not yet mature and have the potential for significant future growth. In particular, where these are to be retained, consideration to their ultimate crown spread should be given as future branch growth may result in interference with proposed buildings, damage to branches and the need for a tree pruning regime to be implemented.

4.7 Within the area of maximum branch spread construction activities should be restricted for the long-term health and vigour of the trees. Within this zone the construction of hard surfaces and lightly loaded or low level structures such as garages and car ports can be considered.

Root Protection Areas

4.8 Root Protection Areas for each tree and group of trees surveyed have been determined in accordance with BS5837:2005 Table 2, and a schedule of Root Protection Areas is attached to this report as Table 3. Initial Root Protection Areas for the trees have been plotted onto the Tree Constraints Plan as circles, with the tree located centrally, extending to encompass the area of ground, and thus the rootable soil volume, as determined from use of BS5837 Table 2.

4.9 All development, including new hard landscaping, where possible shall be situated outside of the retained trees designated Root Protection Areas. As the design and layout of the proposed development is progressed and finalised it is recommended that final Root Protection Areas for the trees are considered and a Tree Protection Plan is produced in conjunction with a detailed Arboricultural Implications Assessment and Method Statement to detail the specific measures for protection of retained trees.

4.10 All protective fencing and other measures should be on site and in place (refer to Appendix 4 for fencing details) before site preparation or construction work commences.

Existing Canopy Spreads

4.11 Where the Root Protection Areas for retained trees do not extend to the edge of existing canopy spreads it is possible that those parts of the trees extending beyond the RPA fencing may sustain damage during construction.

4.12 Where this occurs there are two primary options available to manage and minimise the potential for damage to tree canopies to occur during development and these may be used singularly or in combination.

4.13 The first option is to create a Construction Exclusion Zone (CEZ), by the erection of protective fencing, around the full extent of the trees. The second is to undertake pre-development pruning works to the trees to reduce the potential for branch damage to occur.

Shading

4.14 It should be appreciated during the design of the development that trees can cause shading and obstruction of daylight and sunlight. It should be recognised that the extent of shading likely will vary with tree species, canopy shape and size, foliage density, time of year and sun elevation and that such shading will often be seasonal and diffuse.

Building Foundations

4.15 Any structures built on the site should comply with the foundation depths for buildings near or adjacent to trees and allow for the potential size of the trees at maturity. The soil types throughout the site will need investigating and appropriate measures taken.

4.16 If trees are removed across the site the potential for soil heave should be assessed and foundations designed accordingly. (NHBC Chapter 4.2, 2007)

Service Runs

4.17 All service runs, utilities and similar infrastructure should take note of trees and allow for working methods that will minimise damage to trees by referring to documents such as NJUG Volume 4 - Guidelines for the planning, installation and maintenance of utility services in proximity to trees. (National Joint Utilities Group 2007)

Site Compounds and Materials Stores

4.18 Provision for materials storage, site offices, deliveries and other related activities should be made available in areas away from retained trees.

Levels Changes

4.19 Any level changes adjacent to trees should be assessed for their impact. Particular care should be taken with respect to mature trees, as these cannot respond to changes as rapidly as younger trees.

New Hard Surfaces

4.20 The construction of new hard surfaces around trees has the potential to cause soil compaction, to cause root damage and to reduce nutrient and moisture availability to tree roots to the detriment of tree health and vitality.

4.21 To minimise harm occurring as a result of such works where installation of new hard surfacing is proposed within the Root Protection Areas of retained trees it must be installed in accordance with no-dig principles.

Removal of Hard Surfaces

4.22 Where existing hard surfaces are located within the Root Protection Areas of retained trees care should be taken in their removal and such works should be completed by hand and supervised by an Arboricultural Consultant.

4.23 If the area of land within the Root Protection Area of a tree is to be left for a period of time following removal of hard surfacing prior to the installation of a new surface or soft landscaping the line of the protective fencing must be correctly re-established following the initial works to remove the hard surfacing.

Potential Impact of Development

4.24 Trees have finite energy reserves, developed each year throughout the growing season, which are utilised for biological processes such as growth and defence against pests or diseases throughout the following year.

4.25 Any development in proximity to trees has the potential to cause harm to those trees unless control measures are identified and acted upon; as such it is essential to consider the relationship between the proposed development and the retained trees to identify what precautions are necessary, proportionate and appropriate.

4.26 Development has the potential to impact upon the above ground and below ground parts of trees.

4.27 Whilst some damage that can occur, such as physical damage to the trees stems and branches from machinery movements, is clearly visible the impact from other aspects of work common on development sites which can have a significant effect upon the continued health of trees are not always immediately evident.

4.28 Damage that is not immediately evident but which can cause long term harm to retained trees includes things such as damage to the soil structure by compaction causing root damage and levels changes altering the water table and affecting moisture availability.

4.29 To minimise the potential for harm to occur it is essential that trees selected for retention are afforded the appropriate protection and consideration throughout the design and construction phases of development as, by adopting appropriate methods of working and suitable precautionary and protective measures, significant harm to retained trees can be avoided.

4.30 In particular the establishment of a Construction Exclusion Zone (CEZ) by erection of Tree Protection Fencing will minimise the potential for harm to occur to retained trees.

5 Conclusions

5.1 The majority of individual trees and tree groups recorded on the site are of a low, category C, retention value when assessed in accordance with BS5837:2005. These trees should not be considered as a constraint to development where their retention would significantly compromise the desired layout.

5.2 However it must be noted that, as the trees and groups throughout the site are located within close proximity to each other, there are few areas where trees of low retention value are not neighboured by trees of moderate retention value which should generally be considered for retention.

5.3 Indeed as the site has no trees of a high retention value currently it will be of greater importance to ensure that where possible the trees of moderate retention value are incorporated into the proposed development.

5.4 Should the removal of any trees of a moderate retention value be necessary to achieve the proposed development it will be necessary to mitigate their loss by undertaking new tree and landscape planting.

5.5 The retention of the trees and groups to the western boundary of the site should be seen as priority as they form a distinct landscape feature and serve to screen the site from neighbouring development.

5.6 There is little vegetation within the central area of the site and trees and groups are generally situated to the sites boundaries; as such it is considered that there is scope for substantial development within this area without an adverse impact upon the overall tree stock occurring.

5.7 Several trees on the site should be removed irrespective of any development proposals due to their poor condition and potential for structural failure.

5.8 To achieve a satisfactory juxtaposition between new development and those trees selected for retention the guidance contained within section 4 of this report should be considered during the detailed design of the site.

5.9 The proposed development of the site should take into account the presence of retained trees and should ensure that where possible all buildings and new surfaces are located outside of their Root Protection Areas.

5.10 New development should not only take account of current tree sizes and positions, but also of mature tree size.

5.11 Tree protection areas should be established and appropriate protection measures implemented prior to construction. Specifications for erecting protective fencing can be found within Appendix 4.

5.12 Guidelines contained within BS 5837:2005 Trees in Relation to Construction should be followed when dealing with trees. Working methods and specifications should be followed to limit potential damage to trees throughout the construction period.

Tables

Table 1

Tree and Group Survey Data

Tree Survey Data - ASDA, Barnsley

March 2009

Tree Number	Species	Diameter at 1.5m (cms) *	Height (m)	Crown Spread (m)				Canopy Height Above Ground Level (m)	Age Class	Physiological Condition	Structural Condition	Estimated Remaining Contribution (years)	BS Category Grading	Comments
				North	South	East	West							
1	Betula pendula	7	6	1.5	1	1	1	3	Y	Fair	Previously crown lifted	20-40	C1	
2	Betula pendula	10	6	1.5	1.5	1.5	1.5	2	Y	Fair		20-40	C1	
3	Acer pseudoplatanus	96	16	6	5	6	5	2	M	Fair	Trifurcate at base with stems further sub-dividing between 1-3m. Included bark union present where one stem bifurcates at 3m. Minor deadwood and branch dieback in crown.	20-40	B1	Tree is located on bank beyond concrete retaining wall and thus Root Protection Area will not extend to the south of this point. The lower branches of the tree are c.5m above the access road passing the tree due to the changes in level.
4	Crataegus monogyna	12	4	1	1.5	1	1	1.5	Y	Fair	Trifurcate at 1m. Previous partial root plate failure.	<10	R	
5	Sorbus aucuparia	10	5	0	2.5	0	2.5	2.5	Y	Fair	Heavily suppressed specimen of poor form with asymmetrical canopy.	10-20	C1	
6	Betula pendula	30	14	3	4	4	2	2.5	M	Good		20-40	B1	Growing at top of bank adjacent to concrete sectional wall.

* Where the tree is multi stemmed below 1.5m the diameter is the girth above the root flare, measured or estimated

Tree Number	Species	Diameter at 1.5m (cms) *	Height (m)	Crown Spread (m)				Canopy Height Above Ground Level (m)	Age Class	Physiological Condition	Structural Condition	Estimated Remaining Contribution (years)	BS Category Grading	Comments
				North	South	East	West							
7	Betula pendula	14	9	4	0	2	1	3	MA	Poor	Heavily suppressed specimen of poor form. Extensive branch dieback in crown.	<10	R	
8	Acer platanoides	16	10	0.5	2	1.5	2	3	MA	Fair	Suppressed specimen of poor form with asymmetric canopy.	20-40	C1	
9	Acer campestre	14	10	1	2	2	1	3	Y	Fair	Previously crown lifted. Suppressed form.	20-40	C1	
10	Acer campestre	20	9	1	2	1.5	1.5	3	Y	Fair	Bifurcate at 1m. Previously crown lifted. Slightly suppressed form.	20-40	C1	
11	Acer campestre	16	9	1	1	1.5	1.5	3	Y	Fair	Bifurcate at 0.25m. Previously crown lifted. Suppressed form.	20-40	C1	
12	Acer campestre	16	9	1	2.5	1	2	3	Y	Fair	Previously crown lifted. Suppressed form.	20-40	C1	
13	Betula pendula	20	14	3	4	2.5	1.5	3	MA	Good		20-40	B1	Located at the top of a bank adjacent to concrete retaining structure.
14	Betula pendula	16	14	3	2.5	1	1	3	MA	Good		20-40	B1	Located at the top of a bank adjacent to concrete retaining structure.

* Where the tree is multi stemmed below 1.5m the diameter is the girth above the root flare, measured or estimated

Tree Number	Species	Diameter at 1.5m (cms) *	Height (m)	Crown Spread (m)				Canopy Height Above Ground Level (m)	Age Class	Physiological Condition	Structural Condition	Estimated Remaining Contribution (years)	BS Category Grading	Comments
				North	South	East	West							
15	Betula pendula	25	14	4	4	2	2	2.5	MA	Good		20-40	B1	Located at the top of a bank adjacent to concrete retaining structure.
16	Betula pendula	28	15	4	4	1.5	4	2.5	M	Good	Asymmetric suppressed canopy.	20-40	B1	
17	Salix caprea	38	12	7	0	1	1	2	OM	Poor	Heavily suppressed specimen of poor form and leaning to the north. Previous failure has occurred at included bark union at stem base and a small cavity with minor decay is evident at the wound.	<10	R	
18	Acer pseudoplatanus	41	15	1.5	6.5	1.5	5	4	M	Good	Asymmetric canopy and suppressed form. Bifurcate at 2m.	20-40	B1	
19	Salix caprea	42	10	4	3	3	4	3	OM	Fair	Crossing branches and deadwood in crown.	10-20	C1	Growing on bank, soil erosion evident.
20	Salix caprea	40	8	1	2	5	0	3	OM	Fair	Previous partial root plate failure has occurred. Tree appears to have stabilised.	10-20	C1	Growing on bank.
21	Betula pendula	37	15	4	3.5	6	5	2	M	Good		20-40	B1	
22	Prunus sp.	18	10	3	2	4	1	3	MA	Good	Asymmetric crown.	20-40	C1	

* Where the tree is multi stemmed below 1.5m the diameter is the girth above the root flare, measured or estimated

Tree Number	Species	Diameter at 1.5m (cms) *	Height (m)	Crown Spread (m)				Canopy Height Above Ground Level (m)	Age Class	Physiological Condition	Structural Condition	Estimated Remaining Contribution (years)	BS Category Grading	Comments
				North	South	East	West							
23	Betula pendula	31	8	0	2	1	3	3	M	Poor	Substantially dead standing tree with extensive crown dieback evident. Previous branch failure has occurred. Piptoporus betulinus fruiting bodies evident in crown.	<10	R	
24	Betula pendula	34	13	3	4	5	4	2	M	Fair	Suppressed upper canopy. Previously crown lifted. Minor deadwood in crown.	20-40	B1	Ivy restricting full inspection.
25	Acer platanoides	28	12	4	4.5	4.5	2	3	MA	Good	Slightly suppressed.	20-40	B1	
26	Acer pseudoplatanus	42	14	4	4	4.5	3	2	M	Good	Stem is bifurcate at 1.5m.	20-40	B1	Tree is located behind wooden retaining structure and root protection area will not be symmetric.
27	Betula pendula	22	11	3	2	3	2	2	MA	Fair	Minor deadwood and branch dieback in crown.	20-40	B1	
28	Salix caprea	16	8	1.5	2	2.5	2.5	3	MA	Fair	Suppressed form. Minor deadwood in crown.	20-40	C1	
29	Betula pendula	18	5	0	0.5	0	3	3	MA	Poor	Substantially dead tree. Previous stem failure at 5m.	<10	R	

* Where the tree is multi stemmed below 1.5m the diameter is the girth above the root flare, measured or estimated

Tree Number	Species	Diameter at 1.5m (cms) *	Height (m)	Crown Spread (m)				Canopy Height Above Ground Level (m)	Age Class	Physiological Condition	Structural Condition	Estimated Remaining Contribution (years)	BS Category Grading	Comments
				North	South	East	West							
30	Salix caprea	20	8	1	1	0	2.5	2	MA	Poor	Heavily suppressed specimen of very poor form. Numerous stem and branch cankers.	<10	R	
31	Betula pendula	10	5	0.5	0	0	0.5	3	Y	Dead	Dead standing tree.	<10	R	
32	Betula pendula	28	12	2.5	2	5	3.5	2.5	MA	Good	Minor deadwood in crown.	20-40	B1	
33	Betula pendula	25	12	1.5	1.5	5	3	3	MA	Fair	Suppressed form. Minor deadwood and branch dieback in crown. Piptoporus betulinus fruiting bodies on dead branches.	10-20	C1	
34	Betula pendula	28	14	2	3	5	4	2	M	Good	Minor deadwood in crown.	20-40	B1	
35	Sambucus nigra	14	5	1.5	1	1.5	1	2.5	MA	Good		10-20	C1	
36	Betula pendula	22	12	1.5	2	4	4	3	MA	Fair	Asymmetric suppressed canopy. Minor deadwood and branch dieback in crown. Previous branch failure has occurred. Primary limbs in crown crossing.	10-20	C1	
37	Crataegus monogyna	35	8	2	3	1	3	2	M	Good	Stem is bifurcate at 1m. Minor deadwood and crossing branches in crown.	20-40	C1	

* Where the tree is multi stemmed below 1.5m the diameter is the girth above the root flare, measured or estimated

Tree Number	Species	Diameter at 1.5m (cms) *	Height (m)	Crown Spread (m)				Canopy Height Above Ground Level (m)	Age Class	Physiological Condition	Structural Condition	Estimated Remaining Contribution (years)	BS Category Grading	Comments
				North	South	East	West							
38	Betula pendula	20	12	2	1	4	4	4	MA	Fair	Suppressed poor form. Minor deadwood and branch dieback in crown. Previous failure of primary limb at 5m.	10-20	C1	
39	Betula pendula	39	14	2	3	4	4	3	M	Good	Minor deadwood in crown.	20-40	B1	
40	Betula pendula	20	10	0	1	4	2	4	MA	Fair	Heavily suppressed specimen of poor form. Deadwood and branch dieback throughout crown.	10-20	C1	
41	Sambucus nigra	10	4	0.5	1	1.5	1	1.5	Y	Fair	Suppressed specimen.	10-20	C1	
42	Betula pendula	34	14	3	4	4.5	4	3	M	Good	Minor deadwood in crown.	20-40	B1	Ivy on stem and around base of tree restricts inspection.
43	Betula pendula	14	8	0	2	2	0	3	Y	Poor	Heavily suppressed specimen of poor form. In decline with crown dieback evident.	<10	R	
44	Acer pseudoplatanus	11	6	1.5	1.5	2	0.5	2	Y	Fair		20-40	C1	
45	Acer pseudoplatanus	9	5	1	1	1.5	0.5	2	Y	Fair		20-40	C1	
46	Betula pendula	23	10	1.5	4	4	4	2	MA	Fair	Minor deadwood and branch dieback in crown. Suppressed form.	20-40	B2	Ivy on stem and around base of tree restricts inspection.

* Where the tree is multi stemmed below 1.5m the diameter is the girth above the root flare, measured or estimated

Tree Number	Species	Diameter at 1.5m (cms) *	Height (m)	Crown Spread (m)				Canopy Height Above Ground Level (m)	Age Class	Physiological Condition	Structural Condition	Estimated Remaining Contribution (years)	BS Category Grading	Comments
				North	South	East	West							
47	Betula pendula	18	10	2	2	3	3	3	MA	Fair	Minor deadwood and branch dieback in crown. Suppressed form.	20-40	B2	Ivy on stem and around base of tree restricts inspection.
48	Betula pendula	34	12	2	3	3	3	2	MA	Fair	Previous failure of main stem where previously bifurcate at 3m has occurred.	20-40	C1	Ivy on stem and around base of tree restricts inspection.
49	Betula pendula	20	12	1	2	4	0	5	MA	Fair	Heavily suppressed specimen of poor drawn form. Deadwood and branch dieback evident in crown.	20-40	C1	Ivy on stem and around base of tree restricts inspection.
50	Acer pseudoplatanus	30	12	2	4	2	5	2	M	Good	Suppressed asymmetric form.	20-40	B2	Ivy on stem and around base of tree restricts inspection.
51	Acer pseudoplatanus	28	12	4	5	5	0	2	M	Good	Suppressed asymmetric form.	20-40	B2	
52	Betula pendula	20	10	0.5	3	2	4	1	MA	Fair	Heavily suppressed specimen of very poor form biased to the south-west. Minor deadwood in crown.	10-20	C1	Ivy on stem and around base of tree restricts inspection.
53	Betula pendula	26	10	1	5	4	4	3	MA	Good	Significant stem bark wounding. Asymmetrical form.	20-40	B2	Ivy on stem and around base of tree restricts inspection.
54	Betula pendula	23	10	2	2	4	4	2	MA	Fair	Minor deadwood and branch dieback. Previous failure of primary limb / upper stem has occurred.	10-20	C1	Ivy on stem and around base of tree restricts inspection.

* Where the tree is multi stemmed below 1.5m the diameter is the girth above the root flare, measured or estimated

Tree Number	Species	Diameter at 1.5m (cms) *	Height (m)	Crown Spread (m)				Canopy Height Above Ground Level (m)	Age Class	Physiological Condition	Structural Condition	Estimated Remaining Contribution (years)	BS Category Grading	Comments
				North	South	East	West							
55	Betula pendula	26	12	2.5	2.5	3.5	3	2.5	MA	Fair	Minor deadwood	20-40	B2	
56	Betula pendula	30	12	2.5	3	4	3	1.5	M	Fair	Minor deadwood in crown. Previous branch failure has occurred at included bark union and multiple branches are re-growing from this point.	20-40	B2	Ivy on stem and around base of tree restricts inspection.
57	Crataegus monogyna	27	8	1	2	2.5	2	0	MA	Good	Multi-stemmed at base. Crossing branches in crown.	20-40	C1	
58	Betula pendula	36	14	3	4	4	3	2	M	Fair	Minor deadwood and branch dieback in crown.	20-40	B2	Ivy on stem and around base of tree restricts inspection.
59	Acer platanoides cv	9	4	1	1	1	1	2	Y	Good		20-40	C1	Visual inspection of tree stem and base restricted by vegetation.
60	Acer platanoides cv	11	6	1.5	1	1	1	2	Y	Good		20-40	C1	Visual inspection of tree stem and base restricted by vegetation.
61	Betula pendula	14	7	1.5	1.5	1.5	1	2	Y	Good		20-40	C1	Visual inspection of tree stem and base restricted by vegetation.
62	Acer platanoides	12	6	1.5	1.5	1.5	1.5	2	Y	Good		20-40	C1	Visual inspection of tree stem and base restricted by vegetation.

* Where the tree is multi stemmed below 1.5m the diameter is the girth above the root flare, measured or estimated

Tree Number	Species	Diameter at 1.5m (cms) *	Height (m)	Crown Spread (m)				Canopy Height Above Ground Level (m)	Age Class	Physiological Condition	Structural Condition	Estimated Remaining Contribution (years)	BS Category Grading	Comments
				North	South	East	West							
63	Betula pendula	6	3	1	1	1	1	1	Y	Good		20-40	C1	Visual inspection of tree stem and base restricted by vegetation.
64	Acer platanoides cv	13	6	1	1.5	1.5	1	2	Y	Good		20-40	C1	Visual inspection of tree stem and base restricted by vegetation.
65	Acer platanoides	17	8	2	1.5	2	2	2	Y	Good		20-40	B1	Visual inspection of tree stem and base restricted by vegetation.
66	Acer platanoides	18	8	1.5	2	2	2	2	Y	Good	Stem wound at 3m at point of previous failure at included union.	20-40	B1	Visual inspection of tree stem and base restricted by vegetation.
67	Fagus sylvatica	13	7	2	1.5	2	1	1.5	Y	Good		40+	C1	
68	Fagus sylvatica	14	8	1.5	2	1	2	2.5	Y	Good		40+	C1	
69	Betula pendula	56	15	4.5	3.5	4.5	3.5	3	M	Good	Stem is trifurcate at 1.5m. Minor deadwood in crown.	20-40	B1	Ivy restricts detailed inspection.
70	Betula pendula	25	12	2	3	3	2	2.5	MA	Good		20-40	B1	Ivy restricts full inspection.
71	Betula pendula	44	14	5	5	4	4	3	M	Good	Minor deadwood in crown. Stem is bifurcate at 1.6m.	20-40	B1	
72	Acer platanoides	23	9	2.5	2.5	2	2.5	0	MA	Good	Minor epicormic growth at base.	20-40	B1	Potential to develop into category A tree.

* Where the tree is multi stemmed below 1.5m the diameter is the girth above the root flare, measured or estimated

Tree Number	Species	Diameter at 1.5m (cms) *	Height (m)	Crown Spread (m)				Canopy Height Above Ground Level (m)	Age Class	Physiological Condition	Structural Condition	Estimated Remaining Contribution (years)	BS Category Grading	Comments
				North	South	East	West							
73	Acer platanoides	22	9	3	2.5	3	3	2.5	MA	Good		40+	B1	Potential to develop into category A tree.
74	Acer platanoides	26	9	1	3	2.5	2.5	2.5	MA	Good		40+	B1	Potential to develop into category A tree.
75	Acer pseudoplatanus	27	9	4	4	4	4	2	MA	Good	Minor deadwood and pruning stubs in crown. Trifurcate at 2m.	40+	B1	
76	Sorbus aria	23	6	2.5	3	2.5	3	2	M	Good	Major stem bark wounds between ground level and 1.5m affecting 50% of stem circumference.	10-20	C1	
77	Acer platanoides	26	9	2	3	2.5	2.5	2	MA	Good	Epicormic growth at base.	40+	B2	Ground around tree appears to be compacted due to pedestrian traffic.
78	Acer platanoides	27	9	2	2	2.5	2.5	1.5	MA	Fair	Epicormic growth at base.	40+	B2	Ground around tree appears to be compacted due to pedestrian traffic.
79	Acer platanoides	22	9	3	2	2	2	2	MA	Fair	Stem bark wounds.	40+	B2	Ground around tree appears to be compacted due to pedestrian traffic.
80	Acer pseudoplatanus	24	9	3.5	3.5	1	3	2	MA	Fair	Numerous small stem bark wounds. Suppressed asymmetrical canopy.	40+	B2	Ground around tree appears to be compacted due to pedestrian traffic.

* Where the tree is multi stemmed below 1.5m the diameter is the girth above the root flare, measured or estimated

Tree Number	Species	Diameter at 1.5m (cms) *	Height (m)	Crown Spread (m)				Canopy Height Above Ground Level (m)	Age Class	Physiological Condition	Structural Condition	Estimated Remaining Contribution (years)	BS Category Grading	Comments
				North	South	East	West							
81	Acer pseudoplatanus	17	7	1.5	2.5	1.5	2.5	2	MA	Fair	Epicormic growth at stem base.	20-40	B2	
82	Acer pseudoplatanus	25	9	2.5	4	3	4	2	MA	Fair	Epicormic growth at base.	20-40	B2	
83	Acer pseudoplatanus	27	10	4	3	3	4	2	MA	Fair		20-40	B2	
84	Crataegus monogyna	16	6	3	3	1	2	0	MA	Fair	Epicormic growth at base. Suppressed asymmetrical canopy. Crossing branches in crown.	20-40	C1	
85	Sorbus aria	30	9	2.5	3	2	2.5	1.5	M	Good	Minor deadwood and pruning stubs in crown.	10-20	C1	Ground around tree appears to be compacted due to pedestrian traffic.
86	Prunus sp.	11	4	1	1	1	1	1.5	Y	Good		20-40	C1	
87	Fagus sylvatica	22	9	2	2	2	2	1	MA	Good		40+	B1	Good potential to develop into category A specimen.
88	Acer platanoides	21	9	3	2	3	3	2	MA	Good		40+	B1	
89	Acer platanoides	20	9	2	3	3	2	2	MA	Good		40+	B1	

* Where the tree is multi stemmed below 1.5m the diameter is the girth above the root flare, measured or estimated

Tree Number	Species	Diameter at 1.5m (cms) *	Height (m)	Crown Spread (m)				Canopy Height Above Ground Level (m)	Age Class	Physiological Condition	Structural Condition	Estimated Remaining Contribution (years)	BS Category Grading	Comments
				North	South	East	West							
90	Acer platanoides	18	9	2	3	2	3	2	MA	Good		40+	B1	
91	Dead	8	4	0	0	0	0	0	Y	Dead	Dead standing tree	<10	R	
92	Acer platanoides cv	12	5	1	1.5	1	1.5	2	Y	Fair	Stem bark wounds between ground level and 0.5m.	10-20	C1	Within concrete area.
93	Acer platanoides cv	8	5	0.5	1.5	1	1	2	Y	Fair	Broken branches and branch dieback in crown. Declining condition.	<10	R	Planted within concreted area.
94	Acer platanoides cv	7	5	1	1	1	1	2	Y	Fair	Stem bark wounds between 0.5 and 1m.	10-20	C1	Planted within concrete area with little available space for gaseous exchange and moisture infiltration.
95	Acer platanoides	15	6	2	2.5	3	2	2	Y	Fair		10-20	C1	Planted within concrete area with little available space for gaseous exchange and moisture infiltration.
96	Acer platanoides	17	6	2	2	2.5	2	2	Y	Fair		10-20	C1	Planted within concrete area with little available space for gaseous exchange and moisture infiltration.
97	Acer platanoides cv	7	5	1	1	1	1	2	Y	Fair	Major stem bark wounds.	10-20	C1	

* Where the tree is multi stemmed below 1.5m the diameter is the girth above the root flare, measured or estimated

Tree Number	Species	Diameter at 1.5m (cms) *	Height (m)	Crown Spread (m)				Canopy Height Above Ground Level (m)	Age Class	Physiological Condition	Structural Condition	Estimated Remaining Contribution (years)	BS Category Grading	Comments
				North	South	East	West							
98	Acer platanoides	20	7	2	2.5	3	2.5	2	MA	Fair		10-20	C1	Planted within concrete area with little available space for gaseous exchange and moisture infiltration.
99	Acer platanoides	17	7	2.5	2	2.5	1.5	2	MA	Fair	Stem bark wound at 0.2m	10-20	C1	Planted within concrete area with little available space for gaseous exchange and moisture infiltration.
100	Acer platanoides	8	3	1	2	1	1	1.5	Y	Fair	Crown dieback.	10-20	C1	Planted within concrete area with little available space for gaseous exchange and moisture infiltration.
101	Acer platanoides	10	5	2	1	2	2	2	Y	Fair		10-20	C1	Planted within concrete area with little available space for gaseous exchange and moisture infiltration.
102	Acer platanoides	10	3	1	1	1	1	1	Y	Fair	Major stem wounds from ground level to 1.3m	10-20	C1	Planted within concrete area with little available space for gaseous exchange and moisture infiltration.
103	Acer platanoides	7	3	1	0.5	0.5	1	2	Y	Fair	Major stem wounds from ground level to 1m.	<10	R	

* Where the tree is multi stemmed below 1.5m the diameter is the girth above the root flare, measured or estimated

Tree Number	Species	Diameter at 1.5m (cms) *	Height (m)	Crown Spread (m)				Canopy Height Above Ground Level (m)	Age Class	Physiological Condition	Structural Condition	Estimated Remaining Contribution (years)	BS Category Grading	Comments
				North	South	East	West							
104	Acer platanoides	14	6	1.5	2.5	2.5	1.5	2.5	Y	Fair	Stem wounds at ground level to 0.5m.	10-20	C1	Planted within concrete area with little available space for gaseous exchange and moisture infiltration.

* Where the tree is multi stemmed below 1.5m the diameter is the girth above the root flare, measured or estimated

Group Data - ASDA, Barnsley

Group Number	Dominant Species	Lesser / Individual Species	Diameter at 1.5m (cms)	Ave Height (m)	Age	Average Spread (m)	Physiological Condition	Structural Condition	Condition/Comments	ULE (years)	BS Category
1	Crataegus monogyna Sorbus aucuparia Acer platanoides		25	10	MA	10	Good		Hawthorn is Multi-stemmed. Norway Maple is 30cm diameter, Rowan 25cm.	20-40	B2
2	Crataegus monogyna	Acer pseudoplatanus Corylus avellana	25	8	MA	5	Fair	Most are Multi-stemmed.	Group of 9 Hawthorn, 1 Sycamore and 1 Hazel. Single stemmed trees are <15cm diameter.	20-40	C2
3	Betula pendula		25	14	M	8	Fair		Group of 5 Birch of diameters 29, 18, 22, 26, 34cm.	20-40	B2
4	Betula pendula		20	14	MA	6	Fair	Minor deadwood in crowns. 2 trees of suppressed form.	Group of 4 Birch	20-40	B2

Group Number	Dominant Species	Lesser / Individual Species	Diameter at 1.5m (cms)	Ave Height (m)	Age	Average Spread (m)	Physiological Condition	Structural Condition	Condition/Comments	ULE (years)	BS Category
5	Sambucus nigra Crataegus monogyna Salix caprea Salix sp.		15	6	Y	4	Fair		Group of 8 trees.	20-40	C2
6	Acer campestre		12	7	Y	5	Fair	Suppressed form. Several with stem wounds.	Group of 8 Field Maple.	20-40	C2
7	Corylus avellana		60	6	Y	5	Good	Multi-stemmed	Group of 5 Hazel.	40+	B2
8	Prunus sp.		12	6	Y	3	Fair	Suppressed crowns.	Group of 3 Cherries.	20-40	C2
9	Betula pendula	Crataegus monogyna	45	15	M	10	Fair	Minor deadwood in crowns of Birch.	Group of 3 Birch of 32, 34, 45cm diameter and 1 Hawthorn of 24cm diameter.	20-40	B2

Group Number	Dominant Species	Lesser / Individual Species	Diameter at 1.5m (cms)	Ave Height (m)	Age	Average Spread (m)	Physiological Condition	Structural Condition	Condition/Comments	ULE (years)	BS Category
10	Acer platanoides Quercus robur Platanus x hispanica		12	6	Y	5	Good		Mixed group of young trees some large Norway Maple of 20 and 25cm diameter within group.	20-40	C2
11	Betula pendula Quercus robur Prunus sp.		15	8	Y	6	Fair		Mixed group of young trees within landscaped bed.	20-40	C2
12	Prunus sp. Betula pendula Acer platanoides		15	7	Y	5	Fair		Group of young trees in planting bed.	20-40	C2
13	Prunus sp. Quercus robur		17	8	Y	6	Fair	Cherries to western end of group in poor condition.	Group of young trees including one nice Oak of 22cm diameter.	20-40	B2
14	Acer campestre Alnus glutinosa Betula pendula Quercus robur		17	8	Y	4	Good		Dense group of young trees to site boundary.	20-40	B2

Group Number	Dominant Species	Lesser / Individual Species	Diameter at 1.5m (cms)	Ave Height (m)	Age	Average Spread (m)	Physiological Condition	Structural Condition	Condition/Comments	ULE (years)	BS Category
15	Acer campestre		25	8	MA	6	Fair	One specimen is bifurcate at base. Suppressed form due to adjacent trees.	Group of 3 Field Maple of 20, 25 and 35 cm (m) diameter.	20-40	C1

Key to Inspection Report Form

Species	Genus and variety
Height	Measured Clinometer Reading or Estimated Height in Metres
Girth (dbh @ 1.5m)	Diameter measured in cms, or estimated, Where multi stemmed below 1.5m the diameter is taken as that just above the root flare
Spread (m)	Canopy height estimated in metres above ground level
Canopy height (m)	Crown Spread, radius estimated in metres
Physiological Condition	Good, Fair, Poor, Dead
Age Class	Y – Young MA – Maturing (Middle Aged) M – Mature OM - Overmature V – Veteran
Useful Life Expectancy (years)	10, 10-20, 20-40, 40+
BS Categorization	See Cascade Appendices 2

Table 2

Preliminary Management Recommendations

Preliminary Management Recommendations

Tree Number	Species	Structural Condition	Preliminary Management Recommendations
4	Crataegus monogyna	Trifurcate at 1m. Previous partial root plate failure.	Fell and remove
7	Betula pendula	Heavily suppressed specimen of poor form. Extensive branch dieback in crown.	Fell and remove
17	Salix caprea	Heavily suppressed specimen of poor form and leaning to the north. Previous failure has occurred at included bark union at stem base and a small cavity with minor decay is evident at the wound.	Fell and remove
23	Betula pendula	Substantially dead standing tree with extensive crown dieback evident. Previous branch failure has occurred. Piptoporus betulinus fruiting bodies evident in crown.	Fell and remove.
29	Betula pendula	Substantially dead tree. Previous stem failure at 5m.	Fell and remove
30	Salix caprea	Heavily suppressed specimen of very poor form. Numerous stem and branch cankers.	Fell and remove
31	Betula pendula	Dead standing tree.	Fell and remove
43	Betula pendula	Heavily suppressed specimen of poor form. In decline with crown dieback evident.	Fell and remove
56	Betula pendula	Minor deadwood in crown. Previous branch failure has occurred at included bark union and multiple branches are re-growing from this point.	Crown clean.
91	Dead	Dead standing tree	Fell and remove
93	Acer platanoides cv	Broken branches and branch dieback in crown. Declining condition.	Fell and remove.
103	Acer platanoides	Major stem wounds from ground level to 1m.	Fell and remove

Table 3

Root Protection Areas

Tree Root Protection Areas - ASDA, Barnsley

Tree Number	Species	BS5837:2006 Category	Root Protection Area (Radius m)	Root Protection Area (m2)
1	Betula pendula	C1	0.8	2
2	Betula pendula	C1	1.2	4.5
3	Acer pseudoplatanus	B1	9.6	289.5
5	Sorbus aucuparia	C1	1.2	4.5
6	Betula pendula	B1	3.6	40.7
8	Acer platanoides	C1	1.9	11.3
9	Acer campestre	C1	1.7	9.1
10	Acer campestre	C1	2	12.6
11	Acer campestre	C1	1.6	8
12	Acer campestre	C1	1.9	11.3
13	Betula pendula	B1	2.4	18.1
14	Betula pendula	B1	1.9	11.3
15	Betula pendula	B1	3	28.3
16	Betula pendula	B1	3.4	36.3
18	Acer pseudoplatanus	B1	4.9	75.4
19	Salix caprea	C1	4.2	55.4
20	Salix caprea	C1	4	50.3
21	Betula pendula	B1	4.4	60.8
22	Prunus sp.	C1	2.2	15.2
24	Betula pendula	B1	4.1	52.8
25	Acer platanoides	B1	3.4	36.3
26	Acer pseudoplatanus	B1	4.2	55.4
27	Betula pendula	B1	2.6	21.2
28	Salix caprea	C1	1.9	11.3
32	Betula pendula	B1	3.4	36.3
33	Betula pendula	C1	3	28.3
34	Betula pendula	B1	3.4	36.3

Tree Number	Species	BS5837:2006 Category	Root Protection Area (Radius m)	Root Protection Area (m2)
35	Sambucus nigra	C1	1.7	9.1
36	Betula pendula	C1	2.6	21.2
37	Crataegus monogyna	C1	3.5	38.5
38	Betula pendula	C1	2.4	18.1
39	Betula pendula	B1	4.7	69.4
40	Betula pendula	C1	2.4	18.1
41	Sambucus nigra	C1	1.2	4.5
42	Betula pendula	B1	4.1	52.8
44	Acer pseudoplatanus	C1	1.3	5.3
45	Acer pseudoplatanus	C1	1.1	3.8
46	Betula pendula	B2	2.8	24.6
47	Betula pendula	B2	2.2	15.2
48	Betula pendula	C1	4.1	52.8
49	Betula pendula	C1	2.4	18.1
50	Acer pseudoplatanus	B2	3.6	40.7
51	Acer pseudoplatanus	B2	3.4	36.3
52	Betula pendula	C1	2.4	18.1
53	Betula pendula	B2	3.1	30.2
54	Betula pendula	C1	2.8	24.6
55	Betula pendula	B2	3.1	30.2
56	Betula pendula	B2	3.6	40.7
57	Crataegus monogyna	C1	2.7	22.9
58	Betula pendula	B2	4.3	58.1
59	Acer platanoides cv	C1	1.1	3.8
60	Acer platanoides cv	C1	1.3	5.3
61	Betula pendula	C1	1.7	9.1
62	Acer platanoides	C1	1.4	6.2
63	Betula pendula	C1	0.7	1.5

Tree Number	Species	BS5837:2006 Category	Root Protection Area (Radius m)	Root Protection Area (m2)
64	Acer platanoides cv	C1	1.6	8
65	Acer platanoides	B1	2	12.6
66	Acer platanoides	B1	2.2	15.2
67	Fagus sylvatica	C1	1.6	8
68	Fagus sylvatica	C1	1.7	9.1
69	Betula pendula	B1	5.6	98.5
70	Betula pendula	B1	3	28.3
71	Betula pendula	B1	5.3	88.2
72	Acer platanoides	B1	2.8	24.6
73	Acer platanoides	B1	2.6	21.2
74	Acer platanoides	B1	3.1	30.2
75	Acer pseudoplatanus	B1	3.2	32.2
76	Sorbus aria	C1	2.8	24.6
77	Acer platanoides	B2	3.1	30.2
78	Acer platanoides	B2	3.2	32.2
79	Acer platanoides	B2	2.6	21.2
80	Acer pseudoplatanus	B2	2.9	26.4
81	Acer pseudoplatanus	B2	2	12.6
82	Acer pseudoplatanus	B2	3	28.3
83	Acer pseudoplatanus	B2	3.2	32.2
84	Crataegus monogyna	C1	1.9	11.3
85	Sorbus aria	C1	3.6	40.7
86	Prunus sp.	C1	1.3	5.3
87	Fagus sylvatica	B1	2.6	21.2
88	Acer platanoides	B1	2.5	19.6
89	Acer platanoides	B1	2.4	18.1
90	Acer platanoides	B1	2.2	15.2
92	Acer platanoides cv	C1	1.4	6.2

Tree Number	Species	BS5837:2006 Category	Root Protection Area (Radius m)	Root Protection Area (m2)
94	Acer platanoides cv	C1	0.8	2
95	Acer platanoides	C1	1.8	10.2
96	Acer platanoides	C1	2	12.6
97	Acer platanoides cv	C1	0.8	2
98	Acer platanoides	C1	2.4	18.1
99	Acer platanoides	C1	2	12.6
100	Acer platanoides	C1	1	3.1
101	Acer platanoides	C1	1.2	4.5
102	Acer platanoides	C1	1.2	4.5
104	Acer platanoides	C1	1.7	9.1

Figures

Figure 1

Tree Constraints Plan

Appendices

Appendix 1

Methodology

General

On site data was recorded onto site copies of forms.

The site data was transposed in the office into an MS Access database. Individual tree numbers and locations were plotted by eye on to a drawing at the time of the survey. Tree positions were then related to a Topographical survey of the site provided. Colour coded versions of the drawings form part of this report. (Figure 1).

The data recorded includes:

- Height - data gathered using a Suunto optical clinometer PM - 5/1520. Where access to the tree was not possible the Heights were estimated.
- Diameter - measurements taken at 1.5 metres above ground level (complying with requirements for BS5837). Where multiple stems occurred below 1.5m the measurement was take as the point immediately above the root flare. Girth data was gathered using a metric diameter tape, callipers or estimated when no access.
- Tree crown spread – estimated measurement of the four cardinal points to provide information to be used with the arboricultural constraints plan
- Tree Crown Clearance – crown height above ground level
- Tree condition - judged visually using the guidelines produced in the report. The condition is indicated with the appropriate colour on the map found in the report. (see Figure 1)
- Age class - estimated from an examination of the tree in question.

Age Classification

The following classification is employed:

Y - Young:	Saplings and young trees under 10 years of age
MA – Middle Aged / Maturing:	Trees older than 10 years but less than one third of the life expectancy of their species, normally making substantial extension growth.
M - Mature:	Trees between one third and two thirds of the life expectancy of their species. More or less full height and large girth, increasing only slowly.
OM- Overmature:	Trees beyond two thirds of the life expectancy of their species. No significant extension growth. Crown starting to break up and decrease in size.
V – Veteran:	tree that shows features of biological, cultural or aesthetic value that are characteristic of an individual surviving beyond the typical age range for the species.

Estimated Remaining Contribution in Years

The estimated remaining contribution in years is an estimate based on currently known factors of the possible remaining life of the tree as an asset. Clearly, it is impossible to predict changes in condition which may occur in the future and this reflects what is considered reasonable under existing circumstances, The following classification is employed:

Death or removal is likely within less than 10 years

Death or removal is likely within 10-20 years.

Death or removal is likely within 20-40 years.

Death or removal is likely beyond 40 years

The estimated remaining contribution in years will be dependent on the interaction of the typical longevity of the species, its current age and condition with prevailing environmental factors. The estimated remaining contribution in years also dependent on future tree management that can extend useful life in some instances.

Tree Condition.

The tree survey assessed the individual condition of all trees identified on the site. The assessment of condition is based on a visual and professional view.

The categories considered for Physiological Condition are good, fair, poor and dead.

Structural Condition is also commented on and this will include such items of presence of decay and physical defects.

Trees are living organisms and their condition can change rapidly in response to environmental variables. Condition remarks refer to the date of survey and cannot be assumed to remain unchanged. While there is no such thing as a safe tree, regular inspection of trees is recommended to reduce the foreseeable risks associated with trees. There is currently no published guidance from the UK insurance industry on the frequency of tree inspections. In the German courts a bi-annual routine inspection is normally expected for older street trees, giving an indication of the rapidity of change in condition that can occur.

Preliminary Management Recommendations

Recommendations are given where it is felt by the arborist that further investigations are required due to suspected defects and work recommendations for pre construction tree work.

Tree Categorisation Using BS 5837 Methodology

The trees surveyed were categorised using the method explained in BS5837 Trees in Relation to Construction 2005. This method categorizes individual trees, groups and woodlands in a systematic way. Each tree, group or woodland is identified on an attached plan.

Groups are identified as those trees forming a single arboricultural feature with trees that provide companion shelter, are avenues or screens or cultural.

Initially the surveyor will determine if the tree should be regarded as an R category tree. R category trees are those that are low value trees that have little future due to physiological and structural condition.

Other trees are graded A, B or C. The initial category should reflex the trees value in making an important contribution to the amenity of the site over a period of time. The higher the category the longer the perceived time period.

A sub category is included 1, 2 or 3. This sub category reflects the type of value the surveyor feels the tree presents in regards its value to 1 – arboricultural, 2 – landscape, 3 – cultural or conservation.

The cascade chart used is included as Appendix 2 of this report.

Appendix 2

BS5837 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.			

Appendix 3

Botanical and Common Names of Tree Species on the Site

BOTANICAL NAME	COMMON NAME
Acer campestre	Field Maple
Acer platanoides	Norway Maple
Acer platanoides cv	Norway Maple Cultivar
Acer pseudoplatanus	Sycamore
Betula pendula	Silver Birch
Crataegus monogyna	Hawthorn
Fagus sylvatica	Common Beech
Prunus sp.	Cherry in variety
Salix caprea	Goat Willow / Sallow
Sambucus nigra	Elder
Sorbus aria	Whitebeam
Sorbus aucuparia	Rowan / Mountain Ash

Appendix 4

Root Protection Area Fencing Details

Protective Fencing Specifications

Since trees are living organisms which interact with their immediate environment any changes made to their surroundings may have a bearing on that trees future. Developing a site will undoubtedly place any trees within close proximity under some level of stress, which could predispose them to infection. The aim of this method statement is to limit the amount of stress induced by introducing protection measures.

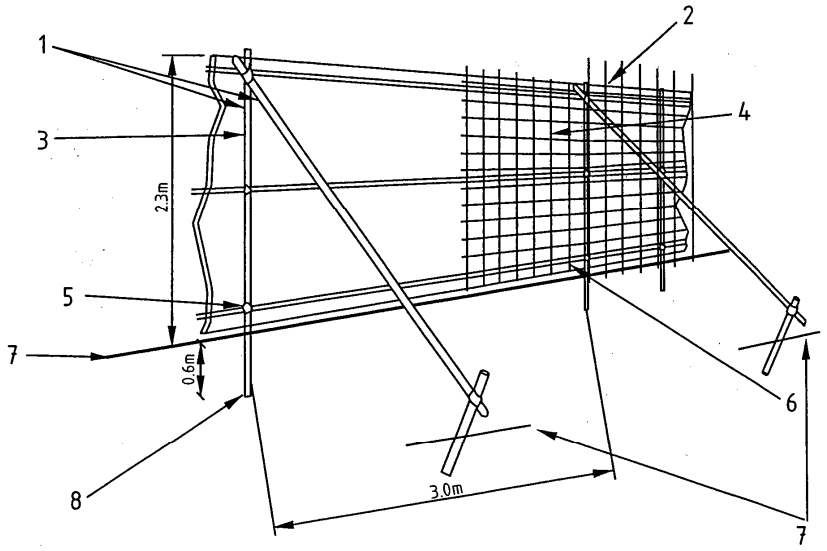
The most effective way of offering protection is by erecting protective barriers set at a distance from the tree stem using the methods given within BS 5837: 2005 Trees in Relation to Construction. Barriers should be braced and constructed to resist impacts; see figures 1 & 2 below for barrier specifications.

Barriers should be erected before any works commence on site with the exception of recommended tree work. Areas of retained and future structure planting should be similarly protected.

All personnel should be made aware of the protected areas and instructed to keep them free of materials, waste and excess soil. Soil disturbance should be prohibited and travel of any kind, including foot traffic should also be excluded within the root protection area (RPA) unless previously agreed and adequate ground protection has been installed. Where foot traffic is agreed within the RPA, single thickness scaffold boards laid over a compressible material on a geotextile, or supported by scaffold should suffice. Where vehicular access through the RPA is agreed an engineer should be consulted to design adequate ground protection methods.

Suggested Barrier Specification (as per BS5837: 2005)

Figure 1



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

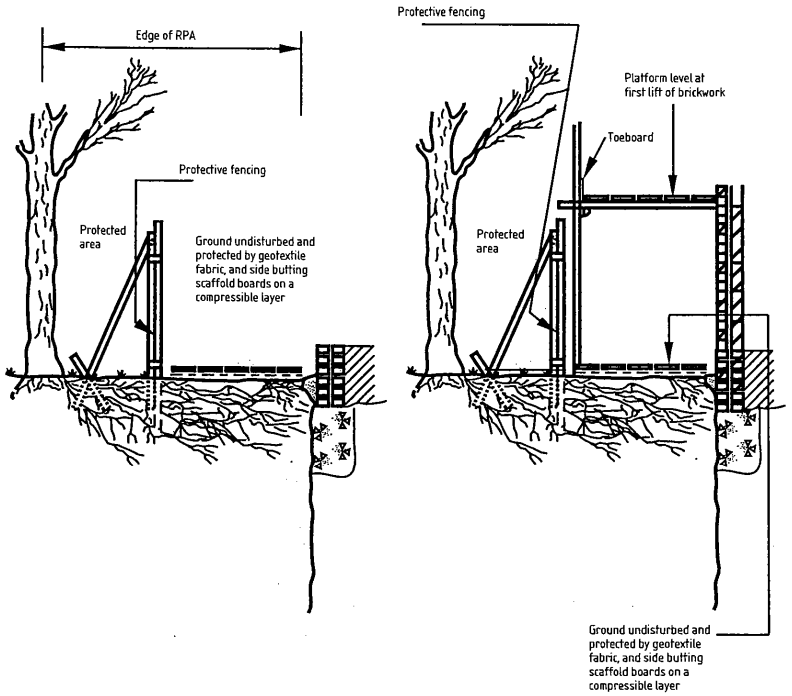
5 Standard clamps

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



Appendix 5

Arboricultural Glossary

Abiotic Factors - Nonliving factors of the environment, including temperature & wind.

Age-class - A general classification of the tree into either - young, semi-mature/maturing, mature, over-mature, or senescent.

Apical Bud/Shoot – The apical bud, also known as the leading shoot, is responsible for shoot extension and is dominant.

Apical Dominance – A singular, leading shoot remains dominant.

Arboreal - In connection with, or in relation to, trees.

Arboriculturalist – Person who has, through relevant education, training and experience, gained recognised qualifications and expertise in the field of trees in relation to construction.

Arboricultural Implications Assessment (AIA) – Study, undertaken by an arboriculturalist, to identify, evaluate and possibly mitigate the extent of direct and indirect impacts on existing trees that may arise as a result of the implementation of any site layout proposal.

Arboricultural Method Statement (AMS) – Methodology for the implementation of any aspect of development that has the potential to result in the loss of or damage to a tree. Note The AMS is likely to include details of an on-site tree protection monitoring regime.

Biotic factors - Living factors. For example, animals and pathogens.

Bottle Butt – Term used to describe shape of stem base, usually associated with an internal defect – refer to 'Reaction Wood' below.

Branch union/junction - The point at which a branch joins a larger stem. Can be a point of weakness, especially in certain species.

Cambium - A lateral meristem (see below) in vascular plants located just beneath the bark responsible for secondary growth, e.g. production of annual growth rings.

Canker – A clearly defined area of dead and sunken or malformed bark, caused by bacteria or fungi. Can have a bearing on structural integrity of infected limb(s) depending on size and location.

Chlorosis/Chlorotic – Abnormal yellow or yellow-green coloration of usually green leaves. Essentially a reduction of chlorophyll levels often as a result disease or nutrient deficiency.

Co-dominant stems - A growth characteristic, where two or more stems of similar size grow from the same point. Can create an inherent weakness.

Compaction - The compressing & hardening of soil around tree root systems, due to vehicular/pedestrian use etc. Loss of pore space between soil granules limits water movement and gaseous exchange, and inhibits root growth.

Competent person – Person who has training and experience relevant to the matter being addressed and an understanding of the requirements of the particular task being approached

Note 1 A competent person understands the hazards and the methods to be implemented to eliminate or reduce the risks that can arise. For example, when on site, a competent person is able to recognise at all times whether it is safe to proceed.

Note 2 A competent person is able to advise on the best means by which the recommendations of this British Standard may be implemented.

Condition – Assessment based on a visual and professional view giving consideration to many factors such as tree health, structural integrity and suitability of its position.

Construction Exclusion Zone – Area based on the RPA (in m^2), identified by an arboriculturalist, to be protected by development, including demolition and construction work, by the use of barriers and/or ground protection fit for purpose to ensure the successful long-term retention of a tree.

Coppice - The method of managing trees by cutting the stems at between 1.0 inch and 1.0 foot from the ground level on a regular cycle, the cut stumps of the trees or shrubs are allowed to re-grow many new stems.

Crown spread - Gives distances between extreme limits of the crown and the stem, usually along the four compass points. Helps to show crown symmetry.

Crown Reduction – The removal of branch ends to reduce the extreme limits of a trees branch spread and height.

Crown Thin – The removal of selected branches within the crown to thin the internal branch structure.

D.B.H. - 'Diameter at Breast Height', an industry standard to gauge tree stem size and development. Within arboriculture, breast height is taken to be 1.5m above ground level.

Dieback - The reduction in crown vigour and extension growth progressing to death of distal parts; often associated with decline.

Epicormic/adventitious growth - New growth from dormant buds that can often form tenuous attachments. Although some species readily form such shoots, it can be an indication of stress.

Feathered Whip – Size of tree for planting, usually ranging from 1.25m to 2.5m in height.

Form - A general assessment of the shape and position of the tree within its' environment.

Frass – Debris such as bore dust left by wood boring insects.

Hanger – Term used to describe a branch that has become detached and is being supported by other branches. Can be a hazard to persons and property below.

Hazard Beam – After the loss of a distal part, a limb concentrates growth upwards creating adverse end weights that can render the limb susceptible to failure.

Heavy Standard – Size of tree for planting, usually above 3.5m in height.

Included bark – Growth characteristic usually caused when two or more stems/branches growing in close proximity 'fuse' together entrapping the bark from when the parts were separate in the middle, creating a structural weakness.

Meristem - The undifferentiated plant tissue from which new cells are formed, such as that at the tip of a stem or root.

Meristematic Disorder – A growth disorder caused by a disruption of the meristem (see above) from any of a number of biotic factors (see above). Manifests as growths such as 'Witches Brooms' & 'Galls'.

Necrosis/Necrotic – Death of tissues usually characterised by a blackening in colour.

Occlusion/Occluded – Normally used to describe the overgrowth of a wound. Also, immoveable foreign objects in contact with a tree part can become encased or 'occluded' by the tree as it grows incrementally.

Pathogen - An agent that causes disease, especially a living microorganism such as a bacterium or fungus.

Plasticity index - The table used to calibrate the shrinkability of a clay soil.

Pollard – The removal and subsequent regular re-removal of the crown of a tree above animal browsing height. Can be an effective method of controlling the size of trees in urban areas. This is ideally begun in the trees early stages and maintained throughout its life.

Reaction wood - Essentially additional wood laid down by the tree to compensate for structural defects such as cavities.

Ring barking/Girdling – the removal of bark around the entire circumference of a stem or branch, causing the death of all distal parts.

Root Protection Area (RPA) – Layout design tool indicating the area surrounding a tree that contains sufficient rooting volume to ensure the survival of the tree, shown in plan form in m^2.

Saprophyte – An organism which exists on dead plant material.

Scaffold branches - The main structural branches within the crown.

Services – Any above ground and piped and/or ducted underground infrastructure including water main, electricity supply, gas supply, fibre optic utilities, telecommunications cabling, storm and foul water drainage, including temporary storage for run-off, pumping stations, interceptors and other allied buried structures.

Shrinkable clay – Clay soil which alters in volume depending on moisture content. Property sited on shrinkable clay can suffer subsidence damage due to soil desiccation; this can be due to the water uptake of nearby vegetation, including trees.

Special engineering – design of a structure with the physiological requirements of trees as the priority.

Standard – Size of tree for planting, usually ranging from 2m to 3.5m in height.

Structure – Man-made object, such as a building, carriageway, path, wall, services, and built and excavated earthworks.

Transplant – (1) size of tree for planting, usually ranges from 0.2m to 0.9m in height (2) the relocation of a tree or shrub including a given portion of the root system.

Tree Constraints Plan (TCP) – Plan prepared by an arboriculturalist for the purposes of layout design showing the RPA and representing the effect that the mature height and spread of retained trees will have on layouts through shade, dominance, etc.

Tree protection plan – scale drawing prepared by an arboriculturalist showing the finalised layout proposals, tree retention and tree and landscape protection measures detailed within the arboricultural method statement (AMS), which can be shown graphically.

U.L.E – 'Useful Life Expectancy' is an estimate based on currently known factors of the possible remaining life of the tree as an asset.

Veteran tree – Tree that, by recognised criteria, shows features of biological, cultural or aesthetic value that are characteristic of, but not exclusive to, individuals surviving beyond the typical age range for the species concerned.

Vigour - A general classification, as to the present and future potential growth and development of a tree. A comment regarding the health status of the tree specific to its species.

Water Demand - A generic classification of the water demand of specific species as outlined by the NHBC (National House Building Council).

Whip – Size of tree for planting, usually ranging from 1m to 1.75m in height.