

# Tree Survey, Categorisation & Constraints Plan

in accordance with  
BS: 5837 2005 (Phase One)

At

The Former Barry Docklands

Dated June 2009

ON THE INSTRUCTIONS OF  
Mr. Simon Brewster  
Soltysbrewster Ltd



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of

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## **1.0. Executive Summary**

1.1. An application for planning approval for a large residential development scheme is to be submitted to the Local Planning Authority. The scheme, known as 'Waterfront Barry', is on former industrial land at Barry Docklands.

1.2. A Predevelopment Tree Constraint Plan assessing the health, condition and amenity value of the trees within the proposed site is undertaken and will provide information to support a planning application to the Local Planning Authority.

1.3. The report highlights several groups of trees considered suitable for retention mainly around the site periphery with very little within the site itself being appropriate. A root protection area is provided for each such tree or group, which in effect may become a constraint to the development and allows for their consideration throughout the design phase, ensuring their basic needs and requirements are identified. The Root Protection Area takes account of a tree's physical and structural requirements.

1.4. Any tree considered unsuitable for retention within the proposed development is recommended for felling. This is the case for Lawson Cypress, Leyland cypress and white willow. Small trees with a stem diameter below 75-mm are not surveyed which include the large areas of developing scrub. The loss of these tree is considered insignificant in terms of landscape and amenity.

## **2.0. Introduction, Qualifications, and Experience**

**2.1.** I, Stephen James Ambler, a Professional Arboriculturalist, hold the following relevant qualifications: -

- a) Lantra Award, Ref: HO00074336 85978 for undertaking the training course “Bats and Arboriculture – A Guide for Practitioners” developed by The Bat Conservation Trust
- b) Certificate in Arboriculture (Royal Forestry Society)
- c) Technicians Certificate in Arboriculture (Arboricultural Association)
- d) Professional Diploma in Arboriculture (Royal Forestry Society)
- e) Associate Member of the Institute of Chartered Foresters
- f) I am a Fellow Member of the Arboricultural Association.

**2.2.** I have 29 years experience working within the arboricultural industry with 19 years of that in Local Government as Principal Arboricultural and Woodlands Officer. My Consultancy Practice was established during 1999 and was expanded in 2006 where my Sons became involved in the launch of a specialist ‘Tree Management Unit’. This addition has increased the level of service offered under the revised name of Steve Ambler Arboricultural Consultancy and Sons Tree Specialists.

**2.3.** I have carried out a ground level inspection on the 29<sup>th</sup> and 30<sup>th</sup> of May and 6<sup>th</sup> June 2009. The weather conditions were bright sunshine and suitable for this type of inspection. This inspection proceeds in line with the basic recommendations described within the British Standard ‘Guide for Trees in Relation to Construction Recommendations’ (BS 5837: 2005) under the heading; Tree Survey, Tree Categorisation and Tree Constraints Plan. This information is required from the outset in the development planning process. (See appendices Planning Flowchart)

**2.4.** The boundary surrounding the proposed development site and identified by plan attached hereto, in which the trees are contained and forms the contents of this report, is hereafter referred to as ‘the site’.

**2.5.** The survey involved a visual inspection or landscape assessment of trees with a stem diameter of above 75-mm when measured at a height of 1.5-m above ground level. The visual inspection consisted of viewing each tree from close quarters and from a distance where possible. The inspection is carried out from ground level and the trees were not climbed.

### **3.0. The Background, Scope, and Purpose of this Report**

**3.1.** The purpose of this report is to consider the trees on this site, their overall perceived importance within the landscape based on their size and position, and to assess their condition, identifying those suitable for retention. The layout of this report encompasses the recommendations of the revised 'British Standard Guide for Trees in Relation to Construction Recommendations' (BS 5837: 2005) whereby it recommends; ***“the land survey should include all existing trees on the site and adjacent to the site within a distance equal to 12 times their stem diameter from the boundary. The trees shall be categorised for their importance and offered as a constraint to the development”***. The suggested planning approach is relayed in the Flow Diagram Sequence, as Figure 1, in the Appendices. The constraints that any retained tree will pose to this development is either plotted on a Tree Constraints Plan, offered as a radial measurement as the Root Protection Area within the final column of the Tables headed as RPA (Item 8.0), or in tabular format on the site drawing.

**3.2.** Where any tree is retained, the RPA is essential and becomes, in effect, a construction exclusion zone (there are exceptions when working under an 'Approved' Arboricultural Method Statement (AMS). An RPA should be respected during the initial design period and throughout the construction works until completion. The RPA represents a radial distance measured from the centre of the trunk (bole) of the tree. Whilst this is not a full condition survey, the tree survey may record details of each tree and may identify any immediately obvious works that may be considered appropriate to increase safety, where prudent to do so, through applying sound arboricultural management.

**3.2.** In considering the 'Planning Flow Chart' in the Appendices (text coloured blue), it becomes apparent the British Standard advocates further information will be necessary on a Tree Protection Plan (TPP), construction exclusion zones, protective barriers, ground protection, service position, special engineering requirements, pre construction tree works, approved tree removals, access facilitation pruning and landscaping. The above is usually presented as an Arboricultural Method Statement (AMS) which should be undertaken by an 'Arboriculturalist' and is usually a requirement of the LPA following their acceptance of the Phase One completion of the tree survey, categorisation and constraint plans.

**3.3.** The report sets out a way forward for the design element to proceed whilst considering the needs and requirements of those trees in adequate condition and with adequate landscape value.

#### **4.0. Site Description**

**Ordnance Survey Grid Reference** is- ST 116 679

**4.1.** The site under investigation is situated on derelict former industrial land known as Barry Docklands, in Barry, South Wales. It borders the south of Barry Town and is just southwest of Cardiff, accessible from the A-4055 and A-4050 roads. It is an extensive site with the former docks to the east, south and west of the proposed development area.

**4.2.** The land under investigation is predominantly level although a steep embankment and cliff at the southern section of the site forms the boundary between a residential development of Barry Island. The site is a derelict brown-field site of former intense industrial usage. It is mainly devoid of tree cover throughout the wide expanse of the site although some scrub is developing in some areas, along with some small insignificant groups of trees. Around the site periphery, mainly outside the boundary, large groups of trees are noted with trees also developing on the steep slopes to the south. The site is divided into areas and the vegetation into groups for ease of description.

#### **4.3. Area A (see picture 1)**

Area A occupies land at the East Quay running either side of the Graving Dock. It is predominantly level and bound on the north by Fford y Mileniwm Road. The eastern section is distinguished by Cory Way and to the west and south by water forming Dock Number 1. It is almost entirely colonized by grasses and broadleaved herbaceous material although the northern boundary sloping upwards towards the road is fenced off at the top, isolating a strip some 20 meters wide containing scrub, predominantly Buddleia (*Buddleia davidii*) approx 2-m high. This has little if any amenity value.

#### **4.4. Area B (containing Groups 1 & 2) (Retention B) (see picture 2)**

##### **Group 1**

Area A, formerly known as the Arno Quay, is mainly flat open grassland bordered on the north by Fford y Mileniwm Road and on the west by the access roadway to car parking bays to the south along Y Rhodfa. Landscape planting to the west is named as **Group 1**, and contains the outgrown species Ash (*Fraxinus excelsior*), Sycamore (*Acer pseudoplatanus*), willow (*Salix*), and white poplar (*Populus alba*). These trees are planted within shrubberies containing among others Sea Buckthorn (*Hippophae rhamnoides*).

##### **4.5. Group 2**



At the top of the embankment running adjacent to the road is a liner, somewhat narrow, landscaped strip of fairly recent landscape planting forming **Group 2**, containing the tree species- Sycamore (*Acer pseudoplatanus*), Black Pine (*Pinus thunbergii*) and white willow (*Salix alba*), approximately 18-20-cm girth, planted amongst a variety of shrubs to the base. The trees form a pleasant immature street scene and are the main focal point to the recent landscaping.

#### **4.6. Area C (containing Groups 3 4, 5, 6 & 8)) (picture 3-6)**

The northern extent of Area C is distinguished by Hood Road, the south by Harbour Road, to the northeast the Tank Wash building and to the west, Powel Duffryn Road. This portion of the site was known as West Pond. Some industrial units, their boundary fencing and landscaping are also situated along the southwest boundary.

**4.6.1.** Area C is again mostly level ground containing grass and some areas of developing scrub namely- willow, Gorse (*Ulex europaeus*) and Buddleia, mostly under 2 meters tall, which occur sporadically as small to medium sized clumps. A small patch of scrub is marked on the plan at the northern most section and this contains Grey Sallow (*Salix cinerea*) which is about 4 meters in height, although stem diameters are below 100-mm.

**4.6.2.** Mounded bunds of concrete rubble are commonplace and laid out on the levels in linear strips many of which are recorded on the plan. These comprise of concrete rubble mounds and some of which are beginning to be colonised by buddleia and other less dominant species. A large wide Z-shaped bund originates from against the western boundary, travels eastwards, and then turns at right angles towards north. This is wider and taller than the others and would appear to be the oldest as vegetation has colonized this standing at 2-m high with gorse, bramble (*Rubus fruticosus*) and buddleia.

**4.6.3.** Along the north western boundary just outside the boundary, fence line **Group 3** is situated which is formed on a mound and the trees range in height from 1 to 10 meters tall. Group 3 contains a variety of trees and shrubs and is contained outside the boundary fence which is 1.7-m high weld-mesh on steel posts. The trees are young to early mature containing the species; common ash, evergreen oak (*Quercus ilex*), common oak (*Quercus robur*), large leaved lime (*Tilia platyphyllos*), Sycamore (*Acer pseudoplatanus*), Italian Alder (*Alnus cordata*) hawthorn (*Crataegus monogyna*), dog rose (*Rosa canina*), viburnum opulus and Gorse (*Ulex europaeus*)

#### **4.7. Group 4**

An informal planting occurs around a small industrial complex which is isolated from the site by a galvanized security boundary fence approx 2-m tall. The planting is within the periphery of the complex and contains white poplar (*Populus alba*), Crack willow (*Salix fragilis*) and buddleia. The white poplars are fairly substantial and their canopies just extend over the boundary and onto the site.

#### **4.8. Area D (see pictures 9 & 10) (Groups 5, 5a, 6, 7 & 8)**

Area D is a linear, crescent shaped feature at the southern extremity of the site. Bound by Clive Road it is formed mainly with a steep sloping North-facing embankment, almost vertical in places, with some exposed rocky outcrops. There is a considerable difference in height from the main body of the site to Clive Road. At the top of this embankment, running adjacent to Clive Road, the land levels out to form a plateau of varying width. Trees and shrubs are sporadic throughout Area D occupying both the slopes and the upper plateau. Whilst the larger groups or specimen trees are recorded, there are a number of individual and small groups of vegetation which are not recorded and thought to be under 75-mm in diameter.

#### **4.9. Group 5**

The western most edge of Group 5 contains a broken covering of young scrub containing hawthorn and buddleia. The vegetation becoming more established as it moves eastwards towards the former Tank Wash building with Ash, Sycamore, Hawthorn, elderberry (*Sambucus nigra*), buddleia, and dog rose (*Rosa canina*) present. Several Leyland cypresses (*x Cupressocyparis leylandii*) are also noted.

#### **4.10. Group 5A**

A monoculture of damson (*Prunus domestica insititia*) running from the fence along the highway to the top edge of the cliff/slope. Currently offers a small screening element from Clive Road looking into the site.

#### **4.11. Group 6**

This is a group of trees developed either side of the steps that transect the area providing pedestrian access between the site and Clive Road. Several Ash and hawthorn gather here but are again early mature and a single yew (*Taxus baccata*)

#### **4.12. Group 7**

A stand of 2 willows some 9 meters tall, 1 hawthorn, 1 Sycamore, and 1 white beam (*Sorbus aria*) are present as a small group.

#### **4.13. Group 8**



A row of Leyland cypress trees are situated opposite number 46 Clive Road located in a north south direction. They stand at approximately 14 meters tall and where possible planted as a hedge to a small allotment type garden.

**4.14. Area E (pictures 11, 12, 13, 14, 15 & 16)(Groups 9 & 10)**

Area E is a linear feature representing a site of intense, former industrial usage. The area is predominantly level, made up of the remnant hard standings for the former oils storage facilities. Grasses, herbaceous material and some perennials occupy the remaining land, outside of these concrete hard stands areas with buddleia and a little Hawthorn occurring sporadically. Dock number 1 demarcates the north of this area. A 2-meter-high chain-link fence runs adjacent to Charles Darwin Way, and a concentration of buddleia occupy the fence-line, these are small, around 2 meters tall and below 75-mm in diameter. The slope and cliff of Area D form a physical boundary to the south.

**4.14.1.** An existing redundant building sits within the eastern section of Area E within an enclosed compound bound by a concrete post and panel fence at around 2.5-m high to the west. Along the western face of this fence, some small hawthorn and buddleia are establishing up to a height of some 2 meters. On the eastern side of the fence, the hawthorn and buddleia are a little larger, perhaps 3 meters tall, but at best described as scrub. They occur on an artificial mound some 1.5 meters tall to give the impression they are taller than in fact they are.

**4.14.2.** To the east of the building is again dominated with concrete hard surfacing and areas of unmanaged grass with bramble and buddleia. However, occurring further east are perhaps the only mature trees within the site standing to the front of the former industrial complex. They include white willow (*Salix alba*) and Lawson Cypress (*Chamaecyparis lawsoniana*).

**4.15. Group 10** comprises of a group of mature white willow to the side of which is some cypress trees

**4.16. Group 11** is a stand of early mature wild cherries found near the existing entrance to the building. These trees are quite young although appear vigorous.

**4.17. Group 12** is a thicket of young trees and shrubs collectively making the densest area of woody vegetation. It contains a mix of predominantly Hawthorn, buddleia, dog rose, elder, ash, and willow. A portion of this area occurs on the existing slopes although the lower portion extending on to the level ground contains somewhat smaller trees, below 75-mm diameter, and no taller than 3 meters.

**5.0. Tree Survey, Tree Survey Plan**

**5.1.** This tree survey is independent of any specific design for development and will include all trees including any that have been missed during the land survey including those outside of the site boundary where they are felt any development may affect them. The quality and value of each tree or group of trees is recorded and allocated to one of four categories each of which are explained under the heading 'Tree Categorisation', (see below Item 6.3).

**5.2.** Each tree or group of trees is identified on the attached plan. A tabular format later in the report (Item 8.0) records the details of each tree against the numbered tag.

**5.3.** Although this is not a condition survey, the general condition of the trees may be recorded and management recommendations may be made, particularly where safety issues may be blatantly obvious from this brief, ground level inspection. However this is not always the case and any observations made here result from a somewhat cursory inspection, and the findings are preliminary only. Tree/s should be subject to regular 'tree condition inspections' and appropriate management and a full tree condition inspection is strongly recommended and particularly on completion of any development.

**5.4.** The survey involved recording each tree or group within the site boundary with a stem diameter of above 75-mm when measured at a height of 1.5-m above ground level. In addition, trees over this size growing on land adjacent to the site, which are at or within a distance equal to 12 times their stem diameter from the boundary (or 10 times the stem diameter in the case of multi-stemmed trees). The visual assessment was somewhat cursory and the trees were not climbed during this ground level inspection.

## **6.0. Tree Categorisation**

**6.1.** The trees within this report are categorised in a way that should help assist those concerned with tree and/or landscape management, within local government, to help form a balanced judgement. Where development is to occur and where trees occupy a site, it may help in the decision-making process as to which trees are appropriate for retention and which are not. The primary purpose of this report is to provide an assessment of the trees and to determine their suitability for retention in any proposed development. A subsequent report, see 'Planning Flow Chart' (Figure 1, Appendices), will provide advice on protecting those trees deemed suitable for retention, during the development phase.

**6.2.** The Tree Categories used in evaluating the trees on this site are reproduced below. This categorisation is also included in the tree data schedules and by colour code on the attached plan.

### 6.3. Tree Categories

#### **Category R (Coloured Dark Red on Plan)**

Those in poor condition that any existing value would be lost in ten years and which should, in the current context, be removed for reasons of sound arboricultural management.

##### **Criteria**

- 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.
- Trees that are dead or otherwise showing signs of significant, immediate and irreversible overall decline.
- Trees affected with pathogens of significance to health and/or safety of other nearby trees or very low quality trees suppressing adjacent trees of better quality

Note; a bat survey may be necessary on trees such as these and particularly where those trees exhibit signs of potential roost site habitat. A Bat survey and mitigation may be necessary (e.g., bat boxes)

#### **Category A (Colour Green on Plan)**

Those of high quality and value;

In such condition as to be able to make a substantial contribution (a minimum of 40 years is suggested)

- **Sub Category 1 Mainly Arboricultural Values**  
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)
- **Sub Category 2 Mainly Landscape Values**  
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)
- **Sub Category 3 Mainly Cultural Values, including Conservation**  
Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)

#### **Category B (Colour mid-blue on Plan)**

Those of moderate quality and value.

Those in such a conditions to make a significant contribution (a minimum of 20 years is suggested)

- **Sub Category 1 Mainly Arboricultural Values**  
Trees that might be included in the high category, but are downgraded because of impaired condition (e.g. presence or remediable defects including unsympathetic past management and minor storm damage)
- **Sub Category 2 Mainly Landscape Values**  
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 having little impact on the wider locality.

- **Sub Category 3 Mainly Cultural Values, including Conservation**

Trees with clearly identifiable conservation or other cultural benefits.

**Category C (Coloured Grey on Plan)**

Those of low quality and value.

Currently in adequate condition to remain until new planting could be established (a minimum of 10 years), or young trees with a stem diameter below 150-mm.

- **Sub Category 1 Mainly Arboricultural Values**

Trees not qualifying in higher categories

- **Sub Category 2 Mainly Landscape Values**

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.

- **Sub Category 3 Mainly Cultural Values, including Conservation**

Trees with very limited or other cultural benefits.

**NOTE:** Category C trees will usually not be retained where they would impose significant constraints on development although young trees with a stem diameter below 150-mm should be considered for relocation.

**NB:** Where remaining contributory years score is provided within the 'Findings', and where further investigative works are required, these scores are preliminary only and based on an incomplete inspection.

#### **6.4. Additional Considerations**

**6.5.** During the course of a tree survey, it might be found that certain trees require immediate attention.

For example, they might present an immediate and serious hazard to life or property, or they might be affected by a pest or pathogen which would cause widespread and serious damage unless eradicated. Where this is the case, the client will be informed.

**6.6.** BS.5837 states particular care is needed when considering the quality and value category of young trees, especially where they occur as individual specimens. Where these are less than 150-mm stem diameter (at 1.5 m above adjacent ground level), it may be relatively straightforward to relocate them within the site (e.g. using a tree spade) or to replace them with similar trees through replanting. Whilst the presence of young trees of good form and vitality is generally desirable (i.e. those trees which have the potential to develop into quality mature specimens), they should not be allowed to dominate site layout considerations. When evaluating the merits of retaining and/or relocating such trees, a comparison between the costs of the various options should be the main determining factor. However, they should be categorised as C grade trees.



## **7.0. Tree Constraints Plan**

**7.1.** The constraints that trees of category A, B, or C pose on the development layout are plotted on the tree constraints plan as a '**Root Protection Area (RPA)**'. This protection area is calculated on the physical and structural needs of the tree/s and takes account of the requirements of the root system. Table 2 of the British Standard is used to achieve the required distances and is essentially a 12 x multiplier of the stem diameter when measured at a height of 1.5-metres above ground level or 10 x in the case of multi stemmed trees. The precise distances required by the RPA is either marked on the plan as a solid line or provided in a tabular format on the drawing which is provided in metres as a radial measurement when measured from the centre of the tree's trunk. Other considerations are provided below along with supporting comments.

**7.2.** Proposed new planting, if necessary, may be marked on the plan as a constraint and soil should be protected from compaction where this is to occur.

## **8.0. Schedule of Findings**

Tree Number	Species	Height	Branch Spread				Effectual Diameter	Crown Clearance	Age class	Physiological Condition	Structural Condition	Notes	Remaining Contribution Years	Category	Protection Radius in M
Group One	Ash (Fraxinus excelsior), Sycamore (Acer pseudoplatanus), Sea Buckthorn (Hippophae rhamnoides), white willow (Salix alba)	10	N	S	E	W	100	0.0	EM	F	F	Group one forms part of a wider landscape planting scheme. It borders the site although the root protection area extends onto the site itself. A RPA distance of 1.2 meters should be taken from the existing boundary fence line.  • <b>No action necessary at this time</b>	20-40	B2	1.2
			-	-	-	-									
Group Two	25 Norway maple (Acer platanoides), 18 Black Pine (Pinus thunbergii), 3 white willow (Salix alba)	5	-	-	-	-	70	2.0	Y	F	F	A row of newly planted material along the roadside. A RPA distance of 1.0 meters should be taken from the existing boundary fence line.  • <b>No action at this time</b>	20-40	B2	1.0
		3	-	-	-	-	-	0.0	Y	-	-				
		5	-	-	-	-	-	1.0	Y	-	-				



Tree Number	Species	Height	Branch Spread				Effectual Diameter	Crown Clearance	Age class	Physiological Condition	Structural Condition	Notes	Remaining Contribution Years	Category	Protection Radius in M
			N	S	E	W									
Group Three and 3A	Ash (Fraxinus excelsior), wild cherry (Prunus avium), evergreen oak (Quercus ilex), common oak (Quercus robur), large leaved lime (Tilia platyphyllos), Italian alder (Alnus cordata), Hawthorn (Crataegus monogyna), viburnum opulus, dog rose (Rosa canina) & Gorse (Ulex europaeus)	1-6-m	-	-	-	-	150	0.0	Y-EM	G	F	An important developing woodland strip with a wide variety of tree and shrub species.  Management will be necessary to encourage the development of this wooded strip. Re-spacing the planting is necessary, as it is presently overcrowded. Such management should look to release the better formed individuals of the selected, climax, native species.  The root protection area for Group Three extends onto the site by 1.8-m when measured from the boundary fence (BF).	20-40	B2 B3	1.8 (BF)
												<ul style="list-style-type: none"> <li>Undertake intervention management in the form of selective re-spacing to allow the group to develop</li> </ul>			

Tree Number	Species	Height	Branch Spread				Effectual Diameter	Crown Clearance	Age class	Physiological Condition	Structural Condition	Notes	Remaining Contribution Years	Category	Protection Radius in M
			N	S	E	W									
Group Four	White poplar (Populus alba), Crack willow (Salix fragilis), buddleia (Buddleia davidii)	12	-	-	-	-	300	1.0	EM/ M	F	F	This former planting skirts the industrial unit just outside the site. It is presently contained by galvanised security palisade fencing. The canopy spread and root protection area extends onto the site by 2 metres when measured from the boundary fence (BF).  • <b>No action necessary at this time</b>	20	B2	2.0 (BF)
Group Five	Hawthorn (Crataegus monogyna), buddleia (Buddleia davidii), Elderberry (Sambucus nigra), dog rose (Rosa canina) & goat willow (Salix caprea)	1.0 – 6.0	-	-	-	-	150	0.0	Y	G	G	This group of vegetation occurs at the south southwest of the site. It is young in age although quickly developing. It offers no screening at present due to its small size but has the potential to provide some screening in the future. Some of it occurs on almost level ground whilst other parts extend part way up the embankment.  If retained, this area of developing tree and shrub cover will require management in the form of re-spacing to release selected individuals.  • <b>No action necessary at this time</b>	20-40	B2 B3	1.8
Group 5a	Damson ( <i>Prunus domestica insititia</i> )	5	-	-	-	-	100	0.0	EM	F	F	A monoculture of damson growing adjacent to Clive Road. All in fair condition and partially screening the residential properties when viewing the site from the north.  • <b>No action necessary at this time</b>	10-20	B2	1.2

Tree Number	Species	Height	Branch Spread				Effective Diameter	Crown Clearance	Age class	Physiological Condition	Structural Condition	Notes	Remaining Contribution Years	Category	Protection Radius in M
			N	S	E	W									
Group Six	1 Hawthorn (Crataegus monogyna) 1 yew (Taxus baccata) 1 Ash (Fraxinus excelsior)	2-10	4	4	8	8	300	2.0	EM	F	G	This Group appears to be in reasonable health and condition <ul style="list-style-type: none"><li>No action necessary at this time</li></ul>	10-20	C2	3.6
Group Seven	2 White willow (Salix alba), 1 Hawthorn (Crataegus monogyna), 1 Sycamore (Acer pseudoplatanus) & 1 white beam (Sorbus aria)	3.0-7.0	-	-	-	-	350 100 100 75	0.5	EM	f	f	A small group of trees and shrubs on the embankment <ul style="list-style-type: none"><li>No action necessary at this time</li></ul>	10-20	C2	4.2
Group Eight	Leyland cypress (x Cupressocyparis leylandii)	5	-	-	-	-	200	1.0	EM	F	F	A row of cypress trees orientated in a north south direction opposite number 46 Clive Road. unsuitable for long term retention. <ul style="list-style-type: none"><li>Consider felling</li></ul>	10-20	C3	2.4
Group Nine	Norway maple (Acer platanoides)	10	4	4	8	8	300	2.0	EM	F	F	A row of 3 maples to the frontage of the former industrial unit. They are in reasonable condition, perhaps a little low in vigour. <ul style="list-style-type: none"><li>No action necessary at this time</li></ul>	10-20	C1	3.6

Tree Number	Species	Height	Branch Spread				Effectual Diameter	Crown Clearance	Age class	Physiological Condition	Structural Condition	Notes	Remaining Contribution Years	Category	Protection Radius in M
			N	S	E	W									
Group Ten	2 White willow ( <i>Salix alba</i> )	16	8	8	10	10	500	1.0	M	F *	F *	2 or 3 mature willow trees. Unable to get access to assess base due to dense bramble and dog rose and therefore this assessment is provisional*  • <b>Clear bramble and dog rose and the Ivy from the main stem and re-inspect</b>	10-20	C2 *	6.0
Group Eleven	Wild cherry ( <i>Prunus avium</i> )	5	-	-	-	-	200	1.0	EM	G	F	A stand of early mature cherries planted in a tight group forming part of an early landscape scheme on the site.  • <b>No action necessary at this time</b>	20-40	C2	2.4
Group Twelve	Hawthorn ( <i>Crataegus monogyna</i> ), buddleia ( <i>Buddleia davidii</i> ), elderberry ( <i>Sambucus nigra</i> ), Ash ( <i>Fraxinus excelsior</i> ) goat willow ( <i>Salix caprea</i> ) dog rose ( <i>Rosa canina</i> ) & Gorse ( <i>Ulex europaeus</i> )	1-4	-	-	-	-	< 100	0.0	Y	G	G	Predominantly hawthorn although containing a mix of species. Situated on the lower eastern levels and some on the slopes facing north. The larger tree sizes are contained on the slopes and the younger material below 75-mm diameter is found on the level area.  With any developing woodland such as this, a longer term management plan should be formed and intervention management necessary. This however is not necessary at this time.  • <b>No action necessary at this time</b>	20-40	C2	1.2

Tree Number	Species	Height	Branch Spread				Effectual Diameter	Crown Clearance	Age class	Physiological Condition	Structural Condition	Notes	Remaining Contribution Years	Category	Protection Radius in M
			N	S	E	W									
T1	Sycamore ( <i>Acer pseudoplatanus</i> )	10					500					A tear-out wound occurs on the west side with some early decay/degradation of xylem tissue becoming evident. A poor specimen with a reduced vigour and life expectancy due to its wounding.  • <b>Monitor wound</b>	10-20	C1	6.0
T2	White beam ( <i>Sorbus aria</i> )	5	2	2	4	0	150	2.0	EM	P	P	Poor specimen which has suffered an incipient root-plate failure. A substantial amount of the crown already dead  • <b>Fell and remove</b>	<10	R	NA
T3	White beam ( <i>Sorbus aria</i> )	6	3	3	6	2	200	2.0	EM	P	P	Poor specimen that appears to have suffered a partial, incipient root-plate failure. Asymmetric crown leans to the east.  • <b>Fell and remove</b>	<10	R	
T4	Lawson Cypress ( <i>Chamaecyparis lawsoniana</i> )	10	3	3	3	3	400	0.0	EM	F	F	Quite large specimens although considered unsuitable for inclusion in any new development.  • <b>Fell and remove</b>	10-20	R	NA

Tree Number	Species	Height	Branch Spread				Effectual Diameter	Crown Clearance	Age class	Physiological Condition	Structural Condition	Notes	Remaining Contribution Years	Category	Protection Radius in M
T5	White willow (Salix alba)	16	N	S	E	W	400	1.0	M	F	F	Individual specimen and again not considered suitable for inclusion in any new development.  • <b>Fell and remove</b>	10-20	R	4.8





## **9.0 General Comments and Observations**

**9.1.** The portion of the former Barry Dockland site under investigation comprises mainly of a large expanse of seemingly derelict land devoid of mature trees of any landscape importance with the exception to a few low value specimens. Only a small number of mature trees exist across this 105 acre site, which are remnant of an earlier and somewhat inadequate landscape scheme around the former industrial building bordering Charles Darwin Way. These trees are not of particularly good form due to the local site and growing conditions and being willow and Leyland cypress are not considered suitable for retention in any housing development scheme. Three Norway maple and a group of early mature cherry are present in reasonable condition but in considering their limited size, the vast nature of the site, and the small number, they offer little constraint to any proposed development here.

**9.2.** Areas of scrub are developing in a haphazard fashion within the internal level areas of the site but are predominantly on ground of industrial wastage where conditions are not compatible with sustaining good quality tree cover in the long term. In reality, the ground conditions appear to be compact and comprising of manmade materials not conducive to sustain the needs of mature trees, many areas of scrub are developing on extensive mounds of building rubble. This scrub material contains mainly buddleia, with hawthorn and willow in smaller numbers and predominantly of a small and insignificant size in terms of landscape amenity. This scrub generally occurs with a stem diameter below 75-mm and ranging in height from 1-2 meters although there is one small isolated occurrence of willow that stands at 3-4 meters high but these have a low life expectancy due to local conditions and contribute very little if anything to the wider landscape.

**9.3.** Just outside the site periphery to the northwest, areas of tree cover of former landscape improvement schemes appear to be developing well and are considerably more important. These plantings offer screening into the site and some conservation and ecological benefits which will improve as the trees and shrubs develop. The tree protection area necessary for these extends onto the site but only by a meter or so and does not offer a significant constraint to the proposed development scheme. Of these, Group 3 to the northwest is the most substantial containing a wide mix of trees and shrubs that are developing well to form a linear landscape feature with good long-term potential to provide a strip of woodland cover. For it to develop its full potential, it will require adequate and appropriate arboricultural/woodland management programming.

**9.4.** Along the slopes and exposed cliff situated at the southern edge of the site (identified as Area D) and the associated plateau against Clive Road, areas of scrub are developing that perhaps have a long-term potential to provide screening into the site and some landscape interest. It currently encompasses young tree and shrub development in an area that due to the topography and geology is unlikely to be developable. It may be possible to leave mature further to provide landscape interest and wildlife diversity. However, the suitability of the geology supporting any future tree growth should be considered in any long-term planning of the area and it would be prudent to discourage the development of trees from the steep slopes with exposed rock or an underlying geology which may be unsuitable to support the development of mature trees. However, there are clearly some areas where tree and shrub growth could be encouraged although a longer term management plan would be necessary to develop this.

**9.5.** In order to retain any trees on a development site successfully, adequate protection throughout the construction phase will be required to protect the Root Protection Areas. Damage to trees often occurs on construction sites due to soil compaction, root severance, mechanical injury to roots, stems or branches and or changes in ground levels when they occur in proximity to trees. **Tree protection** must involve the erection of a suitably robust 'Barrier Fencing' at appropriate distances from the trunk of each retained tree. Such matters are advised within the British Standard Guide for Trees in Relation to Construction Recommendations (BS 5837: 2005) and whilst outside the scope of this report, are usually presented as a '**Tree Protection Plan**' and '**Arboricultural Method Statement**' in an additional document following the initial design.

**9.6.** The younger trees, those with a stem diameter of below 150-mm, should not impose significant restraints on the development layout and could be considered for replacing their loss with the replanting of heavy, semi-mature stock.

#### **9.7. Impact of the Proposed Development on Existing Trees.**

#### **9.8. Group 1 & 2**

Groups 1 & 2 comprise of a mixture of trees and shrubs of a young age that form part of a larger Environmental Improvement scheme. They sit just outside the site boundary although their RPA does extend slightly onto the site. This planting may be retained and will remain unaffected by the proposed development providing adequate protection measures are taken.

#### **9.10. Group 3 and 3A**

Both these Groups exist outside of the site and run adjacent to the existing boundary fence. They may be retained and will the development will not significantly impact them although their RPA does extend into the site by just 1.8 metres from the existing boundary fence. Protective barrier fencing will be sufficient to enable them to be retained successfully.

#### **9.11. Group 4**

This Group is identified because although it occurs outside of the site boundary the RPA does extend onto the site slightly by 2 meters. These trees may be retained in the present scheme

#### **9.12. Group 5**

The trees categorised as Group 5 occur partially on the level area to be developed and partially on the slopes which are not. The portion of the Group that is to be lost is young and immature and at present offer no screening into or out of the site. Therefore, their loss will not be significant in terms of landscape and amenity.

#### **9.13. Groups 5A, 6, 7, & 8.**

All these groups are contained on the severe slopes and exposed rock outcrops and in areas that are not to be developed. The site topography itself would appear to be undevelopable and does offer protection from construction impact. As such, these trees are not seen to be at threat from the proposed development.

#### **9.14. Group 9**

These Norway maple trees are to be lost to the development. They are currently scored within this report with a retention category of C. It would be possible to relocate them elsewhere on the site to form part of a wider landscape scheme using specialist 'Big-Spade' techniques. But in considering their current form and vigour, it would be best to lose them to the Development and mitigate using fresh planting stock.

#### **9.15. Group 10**

Mature willow growing as a small group. Any potential screening they have would be internal to the site. however, the current proposal dictates their loss which is considered insignificant as they are unsuitable for retention within the proposed development development due to their unreliable and brittle nature and for problems associated with this species.

**9.16. Group 11**

Group 11 comprises of a stand of early mature cherry which do not currently have significant amenity value due to their small size and positioning internally within the site and presently without any screening benefit. As stated earlier, it may be possible to locate such trees but the costs of this against purchasing new stock does not seem a viable option.

**9.17. Group 12**

This group is very similar to Group 5 in its composition and positioning. Parts are situated on level land lost to the development whilst the remainder is establishing on the slopes which are not to be developed. Again, the trees and shrubs are of a young age and do not form significant landscape features at present. With the retention and nurturing of the trees on the slopes, they should develop to form an important component of screening with good landscape impact. Considering this, the loss of the material on the level area is therefore unimportant.

**9.18. Tree 1 (T1)**

Not affected by the development due to its location on top of the slopes.

**9.20. Trees T2, T3, T4, & T5**

These trees highlighted within the report as unsuitable for retention due to their condition or species type and will be lost to the development. They have little impact on the landscape amenity and therefore their loss is considered insignificant.

**9.21. Areas of Scrub**

The report refers to areas of scrub which occur throughout the site. This scrub comprises mainly of Hawthorn and buddleia at a young age. Due to its small size, it currently offers little landscape quality. Much of it occurs in areas where if left it could not develop properly due to the site conditions. The loss of the scrub is not considered significant in terms of landscape.

## **10.0 Recommendations for Reserved Matters**

- (1) As advised within BS 5837, a Tree Protection Plan and Arboricultural Method Statement is required once the final layout for the development is known. Reserved matters should cover this subject.
- (2) Tree felling or clearance works on the site shall not commence until such time written approval is received from the Local Planning Authority
- (3) The development of any site should not be complete until all retained trees have been re-examined by an arboricultural specialist.
- (4) An Arboricultural management plan will be required for Groups

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**Arboricultural Consultancy and Sons Tree Specialists**

### **11.0 Limitations of this Report**

**11.1.** It must be stressed that this report is a pre-development survey and not a risk assessment or a detailed report on the health and condition of the trees. Whilst any problems noted during this ground level inspection are noted, general comments are taken based on a somewhat cursory, visual inspection

**11.2.** There are occasions when even healthy and completely defect-free trees break or become windblown. This represents a "normal failure rate" which is the price of the lightweight, energy-saving structure that favours the species to compete with others in a cost-effective way. However, Visual Tree Assessment (VTA) can be used to determine when a tree is at greater risk of breaking, compared with a completely sound one. Trees have an inherent margin of safety or 'safety factor', as they are usually able to withstand much stronger mechanical loading than occurs under average conditions. Thus, provided that they are free from significant mechanical defects, they can withstand quite severe winds. If, under exceptionally severe conditions, the safety factor of a tree is exceeded, failure is of course possible. It must, however, be accepted that conditions such as these are potentially hazardous whether or not trees are present. On the other hand, trees with mechanical defects sometimes fail under weather conditions which could be reasonably expected to occur from time to time. If such a tree is so placed that it could harm people or property, there is a need to decide whether it represents an unacceptable hazard. If so, some form of remedial action, considered appropriate, will be offered within the schedule.

**11.3.** Every attempt has been made to provide a realistic and accurate assessment of trees and their condition at the time of this inspection. No responsibility can be accepted for damage or injury as a result of the failure of any tree or its parts due to faults not apparent upon a visual inspection carried out at this season, or for faults developing subsequent to the survey. Similarly, no liability can be accepted for the condition of the trees that are obscured in part or by whole (e.g. due to dense ivy or other foliage), nor for any that proved inaccessible to the inspector. Certain features which might provide evidence of ongoing decay or decline (Such as seasonal fruiting bodies, damage to foliage, insect emergence holes etc) may not be in evidence. Only those features present at the time of inspection could be assessed.

**11.4.** This report is based on the trees circumstances and condition at the time of the survey. It must be recognised that the circumstances may be altered radically over the course of any development process and that such changes cannot be accurately predicted. The report also does not provide any specific long-term management recommendations.



**11.5.** The effect this new development may have on localised wind turbulence has not been assessed during this inspection. As trees grow, they respond and mechanically adapt to their surroundings and exposure limits. With the erection of dwellings in close proximity to existing trees, new turbulence is created. The author accepts no liabilities to any failure subsequent upon such new imposed, artificial conditions.

**11.6.** Unless otherwise stated in writing and in the absence of altered circumstances, a report on the health and safety of a tree or trees cannot be relied on after a period of 12 months. Following such a period, a further inspection is required.

**11.7.** Further and more general report limitations are set out in the Author's Terms and Conditions. A copy is provided with this report and further copies are available upon request

## **12.0 Legal Constraints**

**12.1 With regards trees,** the legal constraints on any site should be considered in early planning and well before any work commences on site. Such constraints can cause time delays or problems and should be given full consideration from the outset. The legal constraints here are general constraints that relate to arboriculture and do not cover any other legal matters that may be relevant on this site.

### **12.2 Tree Preservation Orders and Conservation Area Status**

The law on TPO's is in **Part V111 of the Town and Country Planning Act 1990 Town and Country Planning (Trees) Regulations 1999**. When any tree/s are protected by a TPO or are situated within a Conservation Area, it is an offence (1) cut down (2) uproot (3) top (4) lop (5) wilfully damage or (6) wilfully destruct a tree without the express written permission from the Local Planning Authority (LPA), there are exceptions. A LPA may grant permission if considered reasonable following the submission of an application for consent to undertake the works or where in accordance with an Approved Planning Application or under the exemptions within the Town and Country Planning Act 1990 of dead, dying, or dangerous. It is advisable to consult the LPA and an Arborist prior to conducting any tree works under these exemptions.

**12.3 The Wildlife and Countryside Act 1981** protects nesting birds and to disturb nesting birds can be a criminal offence. Therefore, caution must be aired if tree works are programmed during the nesting season, between March and August. Should nesting birds be present then all but essential works will be postponed. If in undertaking essential works a nest or nests are found to be present, then further advice will be sought from the Countryside Council for Wales.

**12.4 (*Wildlife and Countryside Act (as amended) Conservation (Natural Habitats) Regulations 1994*)**

**5.1** In Britain, all bats and their roost sites are currently protected by law. The part of the law that protects them is found within the Wildlife and Countryside Act 1981 and as amended by schedule 12 of the Countryside and Rights of Way Act 2000 and by the Conservation Regulations 1994 under Section 39(1).

**12.5** The legislation makes it an offence to intentionally or recklessly damage, destroy or obstruct access to a site used by bats whether bats are present at the time or not. This can include work on trees whether it is surgery, felling, the covering or filling of cavities or the installation of rod braces and flexible cable braces, where a bat roost is present.

**12.6** Bats are to be fully considered before any tree work commences and particularly if the trees are mature. If a bat roost is known to be in any tree that is to be removed or worked on, a license must be obtained from the Welsh Assembly Government beforehand, there are exceptions.

**12.7** Where there is a risk bat roosts may be present, it is incumbent upon the owner or manager to commission a specialist bat survey to identify bat roosts before instructing tree surgery to commence. Failure to do so and in the event of disturbing a roost site or injuring any bats is an offence. Maximum penalties for committing offences relating to bats or their roosts can amount to imprisonment for a term not exceeding six months or to fines of up to Level 5 on the standard scale under the Criminal Justice Act 1982/ 1991 (i.e. £5000 in April 2001) per roost or bat disturbed or killed, or to both.

**12.8 Statute and Common Law.**

A landowner should be aware that both statute and common law dictates regular inspections of trees on land in their control are necessary where such trees could cause injury or damage in the event they should fall or shed any parts. A person suitably qualified in arboriculture should undertake such routine inspections and any remedial tree works recommended within the time constraints specified, to prevent injury or damage occurring. A landowner should retain records of all inspections and any remedial tree works that have resulted from such inspections. The **Arboricultural Association** at Ampfield House, Ampfield, near Romsey, Hampshire. Telephone 01794 368717 are able to provide advice on suitably qualified persons or indeed suitable qualifications a person should hold to undertake qualified inspections.

### **13.0 Abbreviations**

**Number (No)** The tree number provides reference to an individual tree either by way of T1, T2 (tree 1 or tree 2) and relates to an attached plan showing their approximate positions or through a series of numbers (00123) that relates to a tag on the tree and may also be indicated on an attached plan.

**Species** The species is the given name of the tree which is usually provided in both the common and scientific names.

**Diameter (DBH)** The diameter for each tree is in millimetres based on the diameter or circumference of the trunk measured at a height of approximately 1.5 metres above ground level, unless otherwise stated. All measurements are approximate.

**Crown Spread** The crown spread of the tree is measured as the radius (from the centre of the trunk) in meters and in most cases covering the four points of the compass.

**Height** The height of the tree is measured in metres and is usually approximate. If the abbreviation 'Clinom' appears after the given measurement, it indicates the tree has been measured with an optical measuring instrument, a Clinometer, and is accurate to within 5 metres.

**Age** The age of the tree is given based on its life expectancy. For example an oak tree at an age of 100-years is perceived as early mature when a hawthorn at 100 years would be considered old. Age classes are given as follows: -

- Y. Young trees** (age less than 1/3 life expectancy)
- MA. Middle aged** (between 1/3 – 2/3 life expectancy, still growing vigorously but not as fast as a younger tree)
- M. Mature trees** (above 2/3 life expectancy. Growth rates beginning to slow down at this stage)
- OM. Over Mature trees** (growth rates slow and possibly beginning to display signs of decline)
- V. Veteran** (decline is well set-in but the tree **may** be of specific ecological value. The tree is likely to contain sufficient deadwood and decay that is a special habitat for many rare invertebrates that are considered to be at risk from extension)

**Structural Condition** column notes any defect, signs or symptoms of ill health, structural weaknesses or other problems that are easily and visibly recognised that may affect the physiology or structural integrity of the tree.

**Recommendations** The recommendations are provided giving the appropriate action required for the tree or groups of trees to fulfil the brief, which possibly include reducing foreseeable risk or improve the physiology of the tree.

**Priority Coding** is provided to relay the urgency in which any recommended work is required based on the health and safety of the site and the considered target occupancy. It may be helpful for budgeting purposes.

- Priority 1** Top priority; to be undertaken as soon as it is practicable for reasons of offsetting foreseeable risk, injury or damage and where the probability of such occurring is considered high.
- Priority 2** Medium priority; attention strongly advised at your earliest convenience to deal with a problem that whilst is not as serious as priority one, carries significant concern. In any event, works should be completed within 6 months.

- Priority 3** Low Priority; the work is advised but of a lower priority than above which should be carried out before a period of 12-months lapses.
- Priority 4** Minor Problems representing no immediate hazard at the time of inspection although potential for harm or hazard to develop as the tree grows Or faults developing that may become significant at a later date if left to develop.. Works without any immediate urgency, possibly to rectify a minor fault or to abate a nuisance present or developing.

**Root Protection Area** this is a protection area established for around the base of each tree to prevent physical, chemical or compaction damage occurring. This is usually achieved through the erection of fencing or other barrier.

**Construction Exclusion Zone** this is an area established where construction is not permitted and usually correlates to the Root Protection Area.

**Special Precaution Area** this is an area, usually within the root protection area, where construction or other activity may be permitted but only under the direction of a 'Arboricultural Method Statement' and the supervision of an Arborist.

- ***All measurements given are approximate.***
- A.G.L an abbreviation for above ground level.

#### **14.0. Glossary of Terms**

**Arboriculture:** the culture and management of trees as groups and individuals, primarily for amenity and urban forestry excluding commercial forestry purposes.

**Arboriculturalist;** person who has, through relevant education, training and experience, gained recognised qualifications and expertise in the management of trees generally and in relation to construction.

**Architecture:** in a tree, a term describing the pattern of branching of the crown or root system.

**Arboricultural Implication Assessment (AIA)** study, undertaken by an arboriculturalist, to identify, evaluate and possibly mitigate the extent of direct and indirect impact on existing trees that may arise as a result of the implementation of the site layout.

**Arboricultural Method Statement;** methodology for the implementation of any aspects of development that has the potential to result in loss of or damage to a tree.

**Assessment:** in relation to tree hazards, the process of estimating the risk which a tree or group of trees poses to persons or property (THIS INVOLVES A VISUAL INSPECTION FOR DEFECTS AND CONTRIBUTORY SITE FACTORS, AND SOMETIMES ALSO A DETAILED INVESTIGATION OF SUSPECTED DEFECTS)

**Bole (trunk)** the main stem of a tree below its first major branch

**Branch:** a limb extending from the main stem or parent branch of a tree

**Canopy:** the topmost layer of twigs and foliage in a woodland, tree or group of trees

**Construction Exclusion Zone;** area based on the RPA (meters as a radial measurement and sometimes a m<sup>2</sup>), identified by an Arboriculturalist, to be protected during development, including demolition and construction work, by use of barriers and/or ground protection fit for the purpose to ensure the successful long-term retention of a tree.

**Crown:** in arboriculture the main foliage-bearing portion of a tree containing the leaves and branches

**Defect:** in relation to tree hazards, any feature of a tree that detracts from the uniform distribution of mechanical stress, or which makes the tree mechanically unsuited to its environment.

**Dysfunction:** in woody tissues, the loss of physiological function, especially water conduction.

**Failure:** in connection with tree hazards, a partial or total fracture within woody tissues or loss of cohesion between roots and soil. (IN TOTAL FAILURE THE AFFECTED PART SNAPS OR TEARS AWAY COMPLETELY. IN PARTIAL FAILURE, THERE IS A CRACK OR DEFORMATION WHICH RESULTS IN AN ALTERED DISTRIBUTION OF MECHANICAL STRESS)

**Group:** the term 'group' is intended to identify trees that form cohesive arboricultural features either **aerodynamically** (e.g. trees that provide companion shelter), **visually** (e.g. avenues or screens) or **culturally** including for biodiversity (e.g. parkland or wood pasture).

**Heave:** in relation to a shrinkable clay soil, expansion due to re-wetting, sometimes after the felling or root severance of a tree which was previously extracting moisture from the deeper layers; also, in relation to root growth, the lifting of pavements and other structures by radial expansion; also, in relation to tree stability, the lifting of one side of a wind-rocked root plate.

**Leader:** in a tree, a topmost shoot that has apical dominance.

**Preventive action:** in a tree hazard management, action that helps to prevent injury to persons or damage to property.

**Pruning:** the removal or cutting back of twigs, branches or roots; in some contexts applying only to twigs or small branches only, but more often used to describe all kinds of work involving cutting.

**Retained Tree** a tree that has been considered suitable by an Arborist for retention and which during the design stage is selected for retention and incorporated within the development.

**Risk:** the likelihood of the potential harm from a particular hazard becoming actual harm.

**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<sup>2</sup>

**Soil heave:** *see* heave

**Subsidence:** in relation to soil or structures resting in or on soil, a sinking due to shrinkage when clay soils dry out, sometimes due to extraction of moisture by tree roots.

**Subsidence:** in relation to branches of trees, a term that can be used to describe a progressive downward bending due to increasing weight.

**Targets:** in a tree hazard assessment (and with somewhat incorrect terminology), persons or property or other things of value, which might be harmed by mechanical failure of the tree or by objects falling from it.

**Tree:** a woody plant, which typically has a single main stem and, in maturity, attains a height of at least four metres and a stem diameter at breast height of at least 75-mm.

**Tree Constraint Plan (TCP);** plan prepared by an Arboriculturalist for the purpose 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 Preservation Order:** in Great Britain, an order made by a local authority, whereby the authority's consent is generally required for the cutting down, topping or lopping of specified trees.

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

**Trunk:** the single main stem of a tree.

**Vigour:** in tree assessment, an overall measure of the rate of shoot production, shoot extension or diameter growth (*cf.* vitality)

**Visual Tree Assessment (VTA):** in addition to the literal meaning, a system expounded by Mattheck & Breloer (1995) to aid the diagnosis of potential defects through visual signs and the application of mechanical criteria.

**Wind exposure:** the degree to which a tree or other object is exposed to wind, with regard both to duration and velocity.

**Wind pressure:** the force exerted by wind on a tree or other object.

**Wind snap:** the breaking of a tree stem by wind.

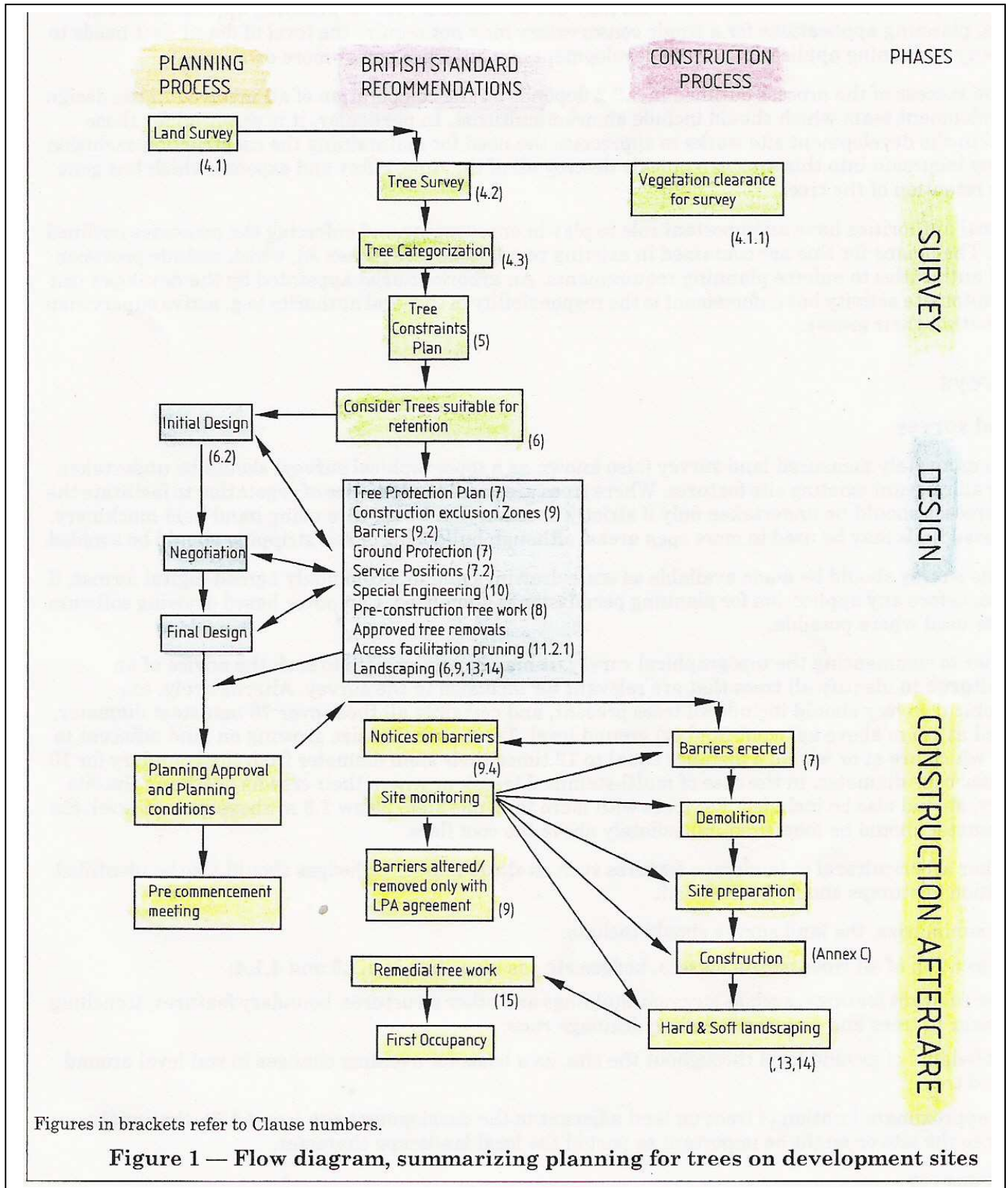
**Windthrow:** the blowing over of a tree at its roots.



## 15.0 References

1. British Standard Guide for Trees in Relation to Construction Recommendations (BS 5837: 2005)
2. Tree Surveys, A Guide to Good Practice, Arboricultural Association (Fay N, Dowson D, Heliwell R)
3. Principles of Tree Hazard Assessment and Management Department of Environment (Lonsdale D)
4. Disease of Forest and Ornamental Trees (Phillips D H and Burdekin D A)
5. Bats and the Law summary (Cowan A)
6. Hazards from Trees, A General Guide, Forestry Practice Guide (Lonsdale D)
7. The Body Language of Trees, A Handbook for Failure Analysis Department of the Environment (Mattheck C and Helge Breloer)

## 16.0 Appendices



## Photographs

1. Area A looking West across open ground
2. Area B Group Two
3. Area C looking North
4. Area C Looking West
5. Area C Group Three
6. Area C Group Four
7. Area D Group Five
8. Area C Scrub developing on mounds
9. Area C looking north to Tank Wash building and Area D
10. Area D from Clive Road
11. Area E looking West
12. Area E looking East
13. Area E looking Northeast
14. Area E Group Nine
15. Area E Group Ten
16. Area E Group 12
17. Exposed tree roots in rock face Area D



**Picture One**

**Area A**

Open grassland

Small amount of scrub (buddleia)  
in background



**Picture Two**

**Area B**

Group 2 on the skyline forming a  
roadside planting



**Picture Three**

**Area C**

Open grassland with some scrub  
on concrete mounds





**Picture Four**

**Area C**



**Picture Five**

**Area C**

Group 3 developing in the background and screening into the site just beginning to form



**Picture Six**

**Area C**

Group 4 left of centre in background and part of group 3 to the right of centre



**Picture Seven**

**Area D**

Group 5 comprises of young material predominantly Hawthorn and buddleia



**Picture Eight**

**Area C**

Scrub Developing on mounds of industrial spoil



**Picture Nine**

**Area C & D**

Looking across Area C to the Tank Wash Building with Area D on the slopes to the rear. The houses along Clive Road are pictured on the skyline.





**Picture Ten**

**Area D**

Area D pictured to the left when  
viewed from Clive Road



**Picture Eleven**

**Area E**

Looking West across Area E.  
(white arrow indicates Group  
Eight)



**Picture Twelve**

**Area E**

Looking East across open  
grassland to the scrub developing  
on the lower slopes of Area D





**Picture Thirteen**

**Area E**

Pictured at the rear of the site is a concrete fence and boundary to the now redundant dockland building. Scrub is developing against the fence on the outer side and on a mound of concrete spoil on the inner side.



**Picture Fourteen**

**Group Nine**

3 Norway Maples to the frontage of the former industrial complex against the former access track of Charles Darwin Way



**Picture Fifteen**

**Group 10**

White willows fairly mature





**Picture Sixteen**

**Area E**

**Group 12**

An expanse of young hawthorn and other trees and shrubs developing on the level area to the east. Further up the slopes, the mix becomes more diverse and larger in size.



**Picture Seventeen (above)**

A single hawthorn growing from the exposed rock face of Area D. Its exposed tree roots are visible. An unsuitable topography for supporting tree development in the long-term and management will be required to discourage trees establishing in such locations.

## **17.0 Site Plan**