



BS5837 Tree Report

Blackburn Rovers Training Ground

Revision A 22.05.12

320120361P

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ENVIRONMENTAL
LAND MANAGEMENT AND PLANNING LTD

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INTRODUCTION

Instruction

Christians Environmental have been instructed to inspect all trees within the site boundary and trees in adjacent land that may be affected by the proposed development. The aim of which is to prepare the following information to accompany a planning submission for the site:

- Schedule of the relevant trees to include basic data and a condition assessment
- Appraisal of the impact of the proposed development on the trees and any resulting impact that has on local amenity
- Arboricultural method statement setting out appropriate protective measures and management for trees to be retained

Purpose of the report

This report provides an analysis of the impact of the proposed development on trees and local amenity with additional guidance on appropriate management and protective measures. Its primary purpose is for the Local Authority to review any tree issues associated with the planning application and use as a basis for issuing a planning consent or engaging in further discussions towards that end. During the planning process, this document and accompanying data will be available for inspection by people including the general public; we aim to present the information in a format that is easily understandable to people without a general knowledge of the subject area.

To make this report easier to use, the context is concise with minimal explanations. Where appropriate we have included further reading and/or explanations within the appendix.

Provided Documents

The following plans have been provided:

- Land Survey, provided in dwg format
- Proposed development layout, provided in pdf & dwg format
- Landscape Master Plan

Tree Data Collection

All Trees on site which are adjacent to any proposed development areas or fall directly into these areas have been numbered and species identified. Each tree has also been inspected as described in British Standard 5837; this includes information on height, diameter, crown spread, maturity condition and recommendations. Each tree is also classified as a category A, B, C or R (Summary in the Appendix). This categorization reflects the trees material constraint on the proposed development. Collection of information also takes into consideration any low branches, structural or physiological conditions and any remaining contribution that the tree offers to the site.

Interpretation of Tree Data

Within section 5 of the British Standard BS 5837 it recommends that the stem diameter taken at breast height is used to calculate the root protection area. This root protection area can be interpreted to identify any design constraints to the site. Once site design has taken place this data can be used to form the basis of any exclusion zone and position of protective barriers/fencing.

Also included within this report are:

- The Tree Constraints Plan which identifies any arboricultural constraints on site.
- The Tree Protection Plan which shows the location of the protective fencing and area set to exclusion zones.

These plans act as a visual aid in the planning stage and are also designed to aid and instruct contractors on site. The use of these plans should also be implemented on site visits to check on the location of the protective barrier and area.

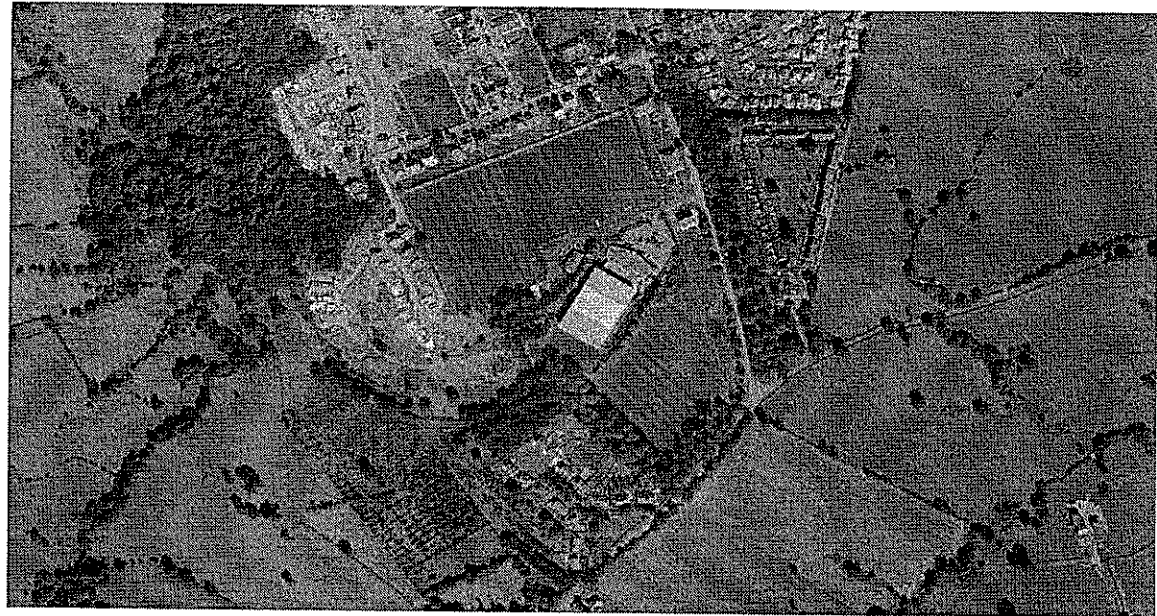
The site is currently a training facility for Blackburn Rovers football club.

The surrounding area is rolling open agricultural land. The site is surrounded by a mature native woodland strip which offers screening to the adjacent highway and residential dwellings.

To the north, separated from the main village by the A59 road, is the original village of Old Langho. Further north there is Brockhall Village, a gated community developed in the 1990s on the site of a hospital.

Langho is a small rural village 5 miles north of Blackburn in the Ribble Valley, Lancashire, England.

It is part of the parish of Billington and Langho. The village is linked with Blackburn and Clitheroe by the A666 road and is served by Langho railway station on the Ribble Valley Line.



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Summary of the impact on trees

Within the proposed development area and including adjacent land there is a total of 30 individual trees and 2 Groups with the potential to be affected by the development proposals

Overview

- 0 trees and 0 Groups will be removed due to the development proposal
- 3 trees are recommended for removal due to poor overall condition and/or safety issues
- 2 trees lie in close proximity to the proposal and will be under enhanced protection during the development

Detailed impact assessment

(Please refer to the Tree Constraints Plan and Tree Data Section when reading the below)

Category A trees and groups.

- 1 Category A tree will have the potential to be effected due to the proposal

Tree T13 will be subject to a very small amount of excavation within the RPA totalling less than 0.9 % of the RPA will be lost

It is recommended that the RPA is offset by 1m

This offset also takes account of working area which would leave enough access to the construction zone for operatives

See Tree Protection Plan For Further Information

Category C trees and groups

- 1 Category C tree will have the potential to be effected due to the proposal

Tree T2 will be subject to a very small amount of excavation within the RPA totalling less than 1.8 % of the RPA will be lost

It is recommended that the RPA is offset by 1.2m.

This offset also takes account of working area which would leave enough access to the construction zone for operatives

See Tree Protection Plan For Further Information.

Category U trees and groups

Trees T2, T4 & T27 are of a condition that warrants their removal due to either physiological or structural condition or a combination of both.

Trees categorised as U are either in such a poor condition or are highly unsuitable for a particular site that removal is recommended for management reasons irrespective of any development proposals. The tree in question is in a state of decline.

For further details please see the Tree data section

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Impact on local amenity

The site currently has a large number of trees within the boundary the majority of which are in excellent overall condition.

As no trees are to be removed to accommodate the proposal the public amenity will not change with regards to trees

To ensure long term amenity value and also enhance screening of the site it recommended that a tree planting scheme is undertaken so that as the more mature trees reach there SULE younger trees are already established as replacements



Location of mature site screening

Protection of retained trees

The successful retention of trees depends on the quality of the protection and the procedures to ensure any protective measures remain in place

This is carried out by means of an arboricultural method statement contained within this report, this is also accompanied by a Tree Protection Plan and on this occasion a Special Construction Plan to highlight the methods used to install new surfaces which are near to a number of trees

Prior to the production of the method statement and design of the tree protection measures, a meeting at the site was attended by the LA Tree Officer and lead arboricultural consultant to discuss the measures needed in detail to ensure the tree was adequately protected

Within this section is the tree survey data, also included is a chart explaining how trees are classed when carrying out a BS 5837:2005 "trees in relation to construction" report. Below is also an overview of acronyms that are commonly used.

Within the appendix is also a glossary of arboricultural terms.

Category Grade	Category Description
Category A:	Those of high quality and value: in such a condition as to be able to make a substantial contribution (a minimum of 40 years is suggested).
Category B:	Those trees of moderate quality and value: those in such a condition as to make a significant contribution (a minimum of 20 years is suggested).
Category C:	Those trees of low quality and value: currently in adequate condition to remain until new planting could be established (a minimum of 10 years is suggested).
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.

KEY:

Tree Numbers/Tags	Individual tree = T+number Group of trees = G+number
Species	Common and/or scientific names where appropriate
Height	Overall tree height
Crown Clearance	Overall height of lowest branches from the ground level
Diameter at breast height	Measurement of tree stem
Canopy spread	Extents of tree branches taken in compass points
Age Class	(Y=Young) (SM=Semi Mature) (M=Mature) (OM=Over Mature) (V=Veteran)
Tree Condition	Comments on trees overall health etc
Comments	Any further details that may be of importance
Management recs	List of urgent works or further investigation that may be needed
Remaining contribution	How long the tree will offer a contribution
Category Rating	See opposite table

Tree No	Species	Height (metres)	Crown Height (metres)	DBH (cm)	N	E	S	W	Age Class	Physiological Condition	Structural Condition	Condition Comments	Preliminary Management Recommendations	Rec Con Years	Cat Grade
T1	Aesculus	12	3	63	5	5	5	4	M	Good	Good	-Bleeding Canker -Deadwood -Minor Tip Decline -Included Union -Restricted Rooting Area	Crown Clean	31-40	A 1
T2	Tilia	8	3	34	2	2	4	4	M	Moderate	Moderate	-Crown Dieback -Fruiting Bodies (Ustilina) -Deadwood -Root Damage -Stem Decay	Fell Tree	<10	U
T3	Aesculus	12	2	54	5	5	6	5	SM	Good	Good	-Bleeding Canker -Deadwood -Low Crown -Branch Damage -Pruning Wounds	Crown Raise	31-40	A 1
T4	Acer	11	4	45	5	4	5	4	OM	Poor	Moderate	-Major Crown Dieback -Major Deadwood -Basal Decay -Bark loss	Fell Tree	<10	U

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Tree Survey Data

4.0

Tree No	Species	Height (metres)	Crown Height (metres)	DBH (cm)	N	E	S	W	Age Class	Physiological Condition	Structural Condition	Condition Comments	Preliminary Management Recommendations	Rec Con Years	Cat Grade
T5	Fraxinus	12	3	31	5	3	4	3	SM	Good	Good	-Suppressed Growth -Minor Basal Damage -Deadwood	No Recommendations	21-30	B.1
T6	Aesculus	11	3	52	5	5	5	5	M	Good	Good	-Foreign Bodies -Snapped/Damaged Branch -Bark Cracking -Basal Issues -Epicormic Growth	Remove Foreign Bodies (Netting)	31-40	A.1
T7	Quercus	16	3	92	11	13	8	6	M	Good	Good	-Major Deadwood -Poor Pruning -Restricted Access To Basal Area	No Recommendations	31-40	A.1
T8	Quercus	17	4	89	7	11	7	9	M	Good	Good	-Deadwood -Restricted Access To Basal Area	No Recommendations	31-40	A.1
T9	Fraxinus	16	7	70	4	7	5	6	M	Moderate	Moderate	-Branch Decay -Deadwood -Minor Decline	No Recommendations	11-20	C.1
T10	Quercus	18	4	70	8	6	5	6	M	Good	Good	-Excellent Specimen -Minor Deadwood	No Recommendations	31-40	A.1
T11	Quercus	17	3	64	5	7	7	4	M	Good	Good	-Minor Deadwood -Very Poor Pruning	Crown Clean & Target Prune	31-40	A.1
T12	Quercus	17	5	58	4	5	4	3	M	Good	Good	-Suppressed Growth -Deadwood	No Recommendations	31-40	A.1
T13	Quercus	22	8	89	10	8	8	8	M	Good	Good	-Deadwood -Minor Storm Damage/Lost Limb	No Recommendations	31-40	A.1
T14	Quercus	18	7	61	6	6	4	7	M	Good	Good	-Deadwood -Stem Vandalism -Suppressed Growth	No Recommendations	31-40	A.1

Tree Survey Data

4.0

Tree No	Species	Height (metres)	Crown Height (metres)	DBH (cm)	N	E	S	W	Age Class	Physiological Condition	Structural Condition	Condition Comments	Preliminary Management Recommendations	Rec Con Years	Cat Grade
T15	Quercus	18	7	71	4	5	5	5	M	Good	Good	-Minor Deadwood	No Recommendations	31-40	A 1
T16	Quercus	19	3	63	5	5	4	4	M	Good	Good	-Unbalanced Crown -Suppressed Growth	No Recommendations	31-40	A 1
T17	Fagus	8	1	26	4	4	3	4	SM	Good	Good	-Suppressed Growth -Low Crown	No Recommendations	21-30	B 1
T18	Quercus	18	3	71	5	5	7	5	M	Good	Good	-Deadwood -Large Hanging Branch	No Recommendations	31-40	A 1
T19	Quercus	19	3	64	6	7	2	4	M	Good	Good	-Unbalanced Crown -Suppressed Growth	No Recommendations	31-40	A 1
T20	Quercus	17	4	52	4	5	4	4	M	Good	Good	-Minor Crown Decline	No Recommendations	21-30	B 1
T21	Quercus	16	3	71	6	5	7	5	M	Good	Good	-Slight Suppression -Deadwood -Poor Pruning	No Recommendations	31-40	A 1
T22	Quercus	18	4	54	7	6	1	4	M	Good	Good	-Major Deadwood -Bark Loss -Heavily Suppressed Growth	No Recommendations	31-40	A 1
T23	Quercus	16	6	52	6	5	4	4	M	Good	Good	-Minor Deadwood -Minor Decline -Tip Dieback	No Recommendations	21-30	B 1
T24	Alnus	8	2	27	3	2	1	3	SM	Good	Good	-Pruning Wounds -Dead Branch	No Recommendations	21-30	B 1

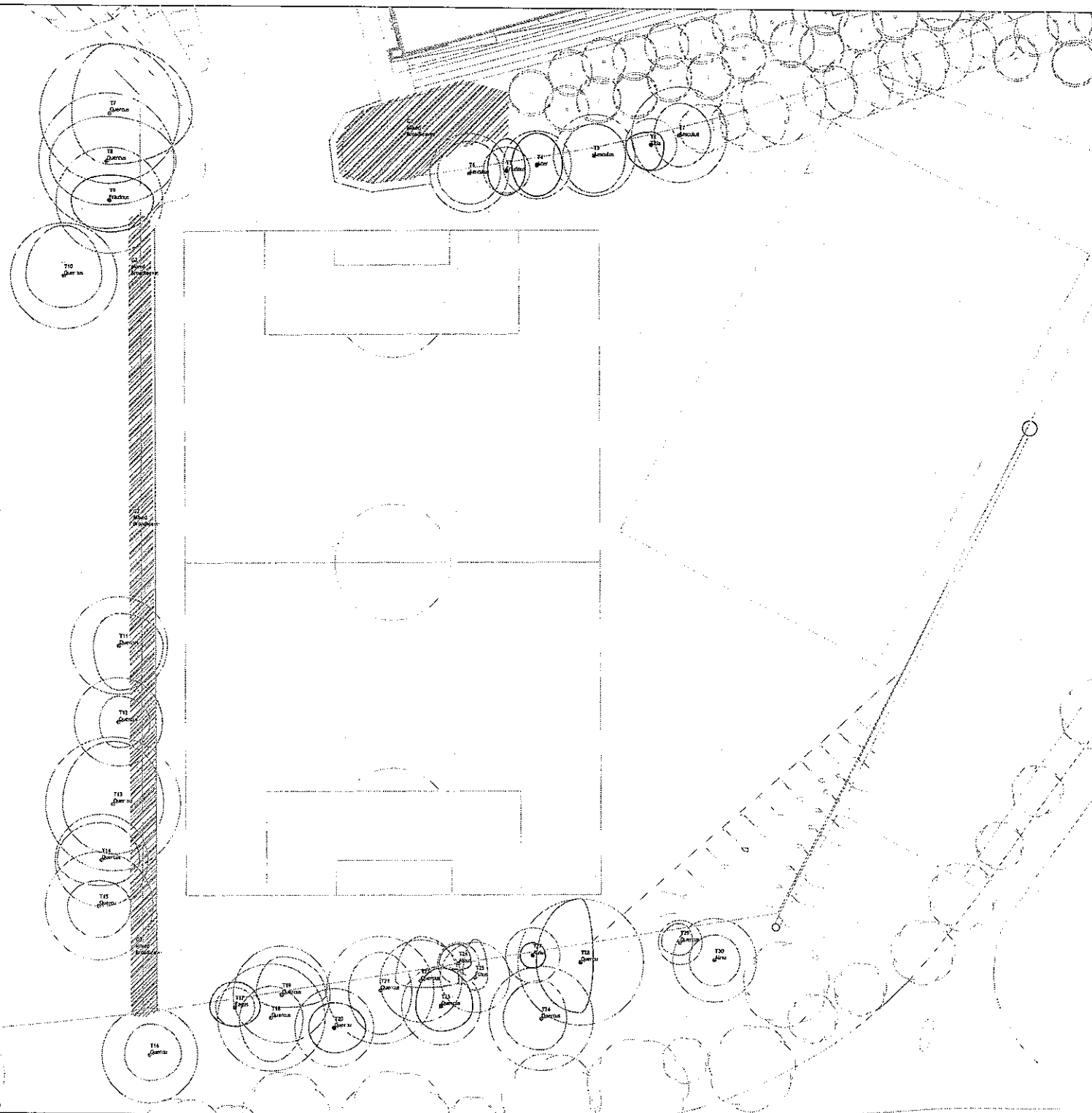
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Tree Survey Data

4.0

Tree No	Species	Height (metres)	Crown Height (metres)	DBH (cm)	N	E	S	W	Age Class	Physiological Condition	Structural Condition	Condition Comments	Preliminary Management Recommendations	Rec Con Years	Cat Grade
T25	Pinus	14	3	46	6	2	2	2	M	Good	Good	-Overall Good Tree	No Recommendations	31-40	A.1
T26	Quercus	19	7	69	6	4	5	6	M	Good	Good	-Stem Ivy -Minor Deadwood	No Recommendations	31-40	A.1
T27	Alnus	10	3	36	2	2	2	2	OM	Dead	Dead	-Dead	Fell Tree	<10	U
T28	Quercus	21	7	83	10	2	8	7	M	Poor	Good	-Poor Form -Deadwood -Branch Defect -Storm Damage	No Recommendations	11-20	C.1
T29	Quercus	6	1	29	3	2	2	3	SM	Good	Good	-Branch Damage -Low Crown	No Recommendations	31-40	A.1
T30	Alnus	10	2	55	4	4	4	4	M	Good	Good	-Deadwood	No Recommendations	31-40	A.1
G1	Mixed Broadleaves	9	1	19	2	2	3	2	J/SM	Good	Good	-Provides Good Screening	Future Selective Thinning	31-40	A.2
G2	Mixed Broadleaves	4	0.5	M5 22	2	3	2	2	OM	Good	Moderate	-Lapsed Hedgerow -Overgrown/Unmanaged -Sections Of Sparse Growth	Lay Hedge & Replant	11-20	C.2

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Deadline:
Call HOT WHEELS PEOPLE 1-800-848-6464, 9/28/91 AM 10 PM
about the contest rules.

2

[illegible]

BS5837:2005 Trees in relation to construction - Categories and definitions

Issues for reconsideration
 (i) Identification act. Place - RED - There is such condition that any standing system would be lost within 10 years and which should, in the course of context, removed for reasons of forest administration management.

Palma

These may have a serious immediate, structure-related effect, such that their early loss is expected to be disruptive, including those that will become unstable after removal of other life category types (i.e., where the relationship between the structure and the control is indicated by points).

These infected with pathogens of significance to the health and/or safety of citizens nearby (e.g. Dutch elm disease) or very low quality.

NOTE: Nicotinic replacement may be appropriate (e.g. if category was 4 or 5 as a bed rest, cessation of the box in positive test)

Items to be considered for inclusion

C. Identification as Plus-Value (Gifts-N-Things of high quality and value: In such a case, it is possible to make a substantial contribution (a minimum of 40 years is suggested).

fit identification on $\beta_{\text{fit}} = \sqrt{2} \Delta \ln \Gamma$. These of moderate quality and value: those in a cell considered to make a significant contribution (a minimum of 20 years is suggested).

Identification on Plan = $\frac{1}{2}$ (YES) = Trees of low quality and value; severely or adequately damaged remain until new planting could be established (a minimum of 10 years is suggested), or young trees with a study diameter below 10 cm.

Category C trees will usually not be retained as a tree, as they would impose a significant constraint on development. Young trees with a stem diameter of less than 100 mm should be scrutinized for allocation. Category A and B trees will normally be retained.

Cellulose - Substratensysteme

The following subcategories are applied. Items may be allocated more than one subcategory, but this will not increase their overall value.

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AT: Issues that are particularly good examples of 1) speeds, especially if new or critical, or essential components of groups, or formal or semi-formal intercultural business (e.g. the dominant and

21: These cut might be included in the high category but are downgraded because of implied conditions: presence of immediate defects including unhygienic pest management and no or scarce drainage.

C: Trees not qualifying

A2: Trees, groups or woodlands which provide a definite screening or screening effect to the locality relative to the lake or out of the site, or those of

BT Trees present in numbers, usually as groups or woodlands, such that they form distinct landscape features, thereby attracting a higher collective value.

that the ratings are individuals but which are not, individually, essential components of lower or semi-formal rhetorical features (e.g. uses of modality qualify within an average that includes letter, "A" category, *symplocon*) or uses situated only indirectly in the data (e.g. *metaphor*).

Q2: Trees planted in groups or rows/bands, but without it is confounding on them significantly greater landscape value, and/or have causing low energy landscape appearance. Inadequate

2. *Mature cultural values*. *Halictus sp.* generally
A2: trees, groups or woodlands of significant
conservation, historical, paleontological or other
value (e.g. veteran trees or wood-pasture)

B3: Trees with clearly identifiable conservation or other cultural benefits
 C2: Trees with very limited conservation or other cultural benefits



Project Blackdown Rocks

Training Ground	
Tells	

Tree Constraints Plan

NAME	DATE
	22/05/201
NAME	DATE
NAME	DATE

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1. $\frac{1}{2} \log \frac{1}{2}$ and $\frac{1}{2} \log \frac{1}{2}$ are the two values of $\log \frac{1}{2}$ in the complex plane.

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Introduction

This Method Statement has been drawn up to assist the Local Authority and the developer in overseeing the construction of the proposed development at Blackburn Rovers Training Ground

This document seeks list those trees which are proposed for removal and discuss any tree constraints and implications

It describes the proposals for ensuring that the trees that are to remain would survive the development and thrive after the development has taken place

The development and timing of construction operations are described, together with materials which would be used in order to maximize tree protection

The document also includes a section of useful telephone numbers and addresses

This statement will be included as part of the specification and schedule of works issued to the building contractor and will form part of the contract. The accompanying arboricultural statement plans will be available on site for inspection along with this method statement

Overview of Stages

- 1) Install tree protection
- 2) Carryout tree removal works
- 4) Carryout Demolition Works
- 4) Carryout construction works
- 5) Remove tree protection once the development is complete
- 6) Final site meeting with LA Tree Officer

Stage 1**Protective Fencing**

Following the completion of any tree works and prior to machinery entering the site for any building, levelling or site clearance purposes, all trees listed to be retained within the development will be fenced off in a continuous line around their specified root protection areas in accordance with British Standard 5837: 2005: clause 7.1 and 7.2

The fencing will be constructed with a framework of scaffolding poles driven 600mm into the ground braced together and backstays will then be added at 3m centres. Onto this will be attached a continuous line of welded mesh panels (alternatively Ply or corrugated sheet metal panels may be used) to be securely fixed with wire or scaffold clamps in accordance with British Standard 5837:2005. For sample see appendix

Site Notices on fencing will be used in the form of pre-printed laminated waterproof signs A3 in size fixed securely to fencing panels on each enclosure at 9m intervals. The signs will clearly read:

Protected Tree Zone**No Storage or Operations Within Fenced off Areas**

Failure to comply with the above requirements could lead to enforcement action, including the issuing of a Stop Notice until the matter has been remedied. Where damage has occurred to legally protected trees, the owner of the site may be liable for prosecution.

A copy of an appropriate tree protection sign is included within the Appendix; a copy can be supplied direct from Christians Arboriculture upon request.

A diagram/plan of fencing design is included within the Appendix.

Before any works commence the arboriculturalist must inspect and approve the position of the protective fencing.

Please contact the arboriculturalist (Christians) for a measured drawing of the protective zones.

Stage 2

Carry out agreed arboricultural removal works.

Tree Removal Works

Due to Poor Condition – T2, T4 & T27

Tree/Vegetation Removal

All trees/vegetation marked for removal, are coded on the Tree Retention Plan to aid arboricultural contractors identify the correct trees.

All arboricultural operations on site including tree removal must be carried out by an arboricultural contractor that is able to comply with British Standards 3998.

All arboricultural contractors should be insured to a minimum of £5 million and able to show competency by means of relevant certification and health and safety policy.

Because of the location of this site and characteristics of certain trees it is recommended that the arboricultural contractors have relevant experience of working with protected species, namely bats. Any qualifications or certification of competency should be sort at the tender stage.

A list of suitably QUALIFIED AND INSURED contractors can be supplied by Christians.

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Works Near Trees

Prior to the commencement of works in the vicinity of retained trees a meeting will be called, to which the local authority's tree officer will be invited. This is in order to agree that the methods and new position of the tree protection fencing are adequate and meet with the local authority's approval

The remainder of the tree removal, excavation, and landscaping works including installation of paths and minor structures within the Root Protection Areas shall be monitored by the developer's arboriculturalist on a regular and frequent basis. Depending on the length of time required to carry out works this may not require a permanent presence but as a minimum they shall be present at the commencement of the following stages of work: (i) tree removal, (ii) excavations, (iii) landscaping, installation of paths and minor structures

Any pre-approved excavation works within the Root Protection areas should only be carried out with consent and instruction from both the developer's arboriculturalist and the local authority's tree officer

Stage 3**Carryout Demolition Works**

Once the tree works have been carried out and the protection is in place the demolition/earthworks can begin

Any areas that are to be changed from hard landscaping to soft landscaping within the RPA's of trees must be done by hand as to ensure minimal disturbance to any tree roots within the lower layers of the hard landscape construction.

Once finished the area should have a soil conditioner or mulch placed over the area to encourage adventitious roots to populate the area

Stage 4**Carryout construction works**

Once the tree protection is in place and assessed and the access roads near to trees are constructed the general construction works can begin

During the construction phase it is important that all staff are aware of the tree protection areas and there importance

If any breach in the tree protection occurs it is the site manager's responsibility to report this urgently to the arboricultural consultants so the appropriate measures can be taken

It is recommended that all staff are made aware of the tree protection measures and procedures during a site induction

Stage 5**Remove stem/tree protection**

When the development is complete, all drainage and service runs are in place and the main site machinery has been removed, temporary protective fencing will be dismantled. This must be done with great care and will need to be supervised to avoid heavy machinery being used

Stage 6**Final site meeting with LA Tree Officer**

Upon completion of all the works specified above and procedures also specified, the developer's arboriculturalist will invite the local authority's tree officer to meet on site to discuss the process and to agree any final remedial works which may be required

Additional Notes

Site Storage, Cement Mixing and Washing Points

All site storage areas, cement mixing and washing points for equipment and vehicles must be outside the RPA and it is recommended that this area is extended to 10 metres away from the protective fencing in respect to the above. Where there is a risk of polluted water runoff into RPA's, heavy duty plastic sheeting and sandbags must be used to contain any spillages and prevent contamination

Services

All service runs will be aligned to pass outside the RPA's of the trees so they will have no effect on the trees

In the rare chance Should the need arise to dig within the protective fence lines at any time the developer's arboriculturist will liaise with the local authority's tree officer in order to implement non-destructive trenching methods (open trenching by use of air spade or a mole dig system)

All work to services on site will be undertaken in line with the NJUG "Guidelines for Planning Installation and Maintenance of Utility Services in Proximity to Trees"

Useful Names And Telephone Numbers

The Arboricultural Consultants –

Christians,

Manchester: BCR House, 3 Bredbury Business Park, Stockport SK6 2SN
London: Suite 404, Albany House, 324/326 Regent Street, London. W1B 3HH
Cumbria: Warwick Mill Business Village Warwick Bridge Carlisle Cumbria CA4 8RR

Tel: 0161 4061862

Emergency Number: 07925 142793

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Tree Protection Site Overview

PITCH 5: 105.10M X 65.50M
3rd generation granite surface to plan

PITCH 6: 43.72M X 73.15M

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Root protection area to be offset by 1.2m.
Protective fencing to be checked by arboriculturalist
before any works commence.

T21 Quercus
T22 Quercus
T23 Quercus
T24 Alnus
T25 Pinus
T27 Alnus
T28 Quercus

Tree Protection Site Close Up

meter of pitch

PEEN

T11
Quercus

T12
Quercus

T13
Quercus

T14
Quercus

T15
Quercus

LP

Root protection area to be offset by 1m.
Protective fencing to be checked by arboriculturalist
before any works commence.

Legend:

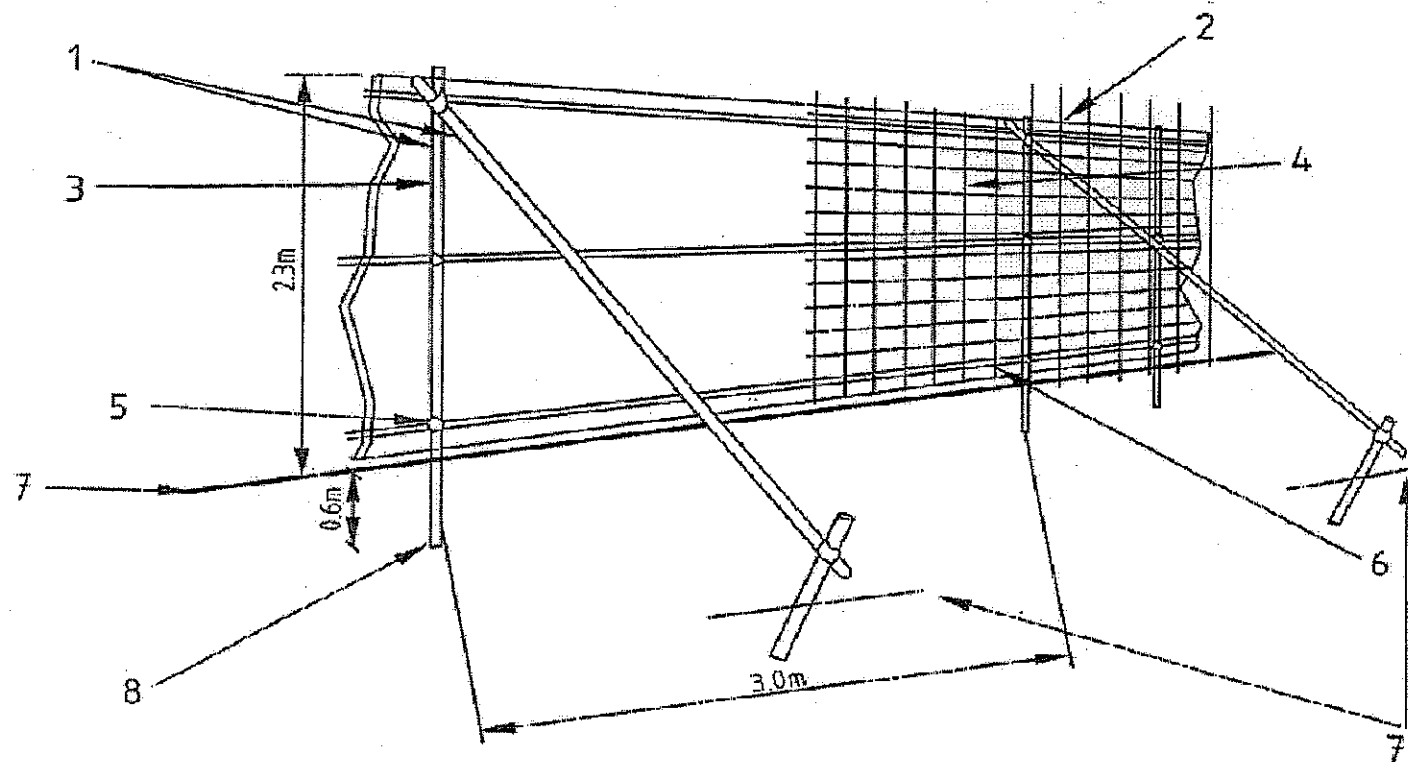
- Tree Group To Remove
- Area Protection In Landscaping Root Barriers
- Proposed New Proprietary Surface
- Location Of New Landscaping

Blackburn Rivers Training Ground

Tree Protection Plan

Date: 20/05/2012

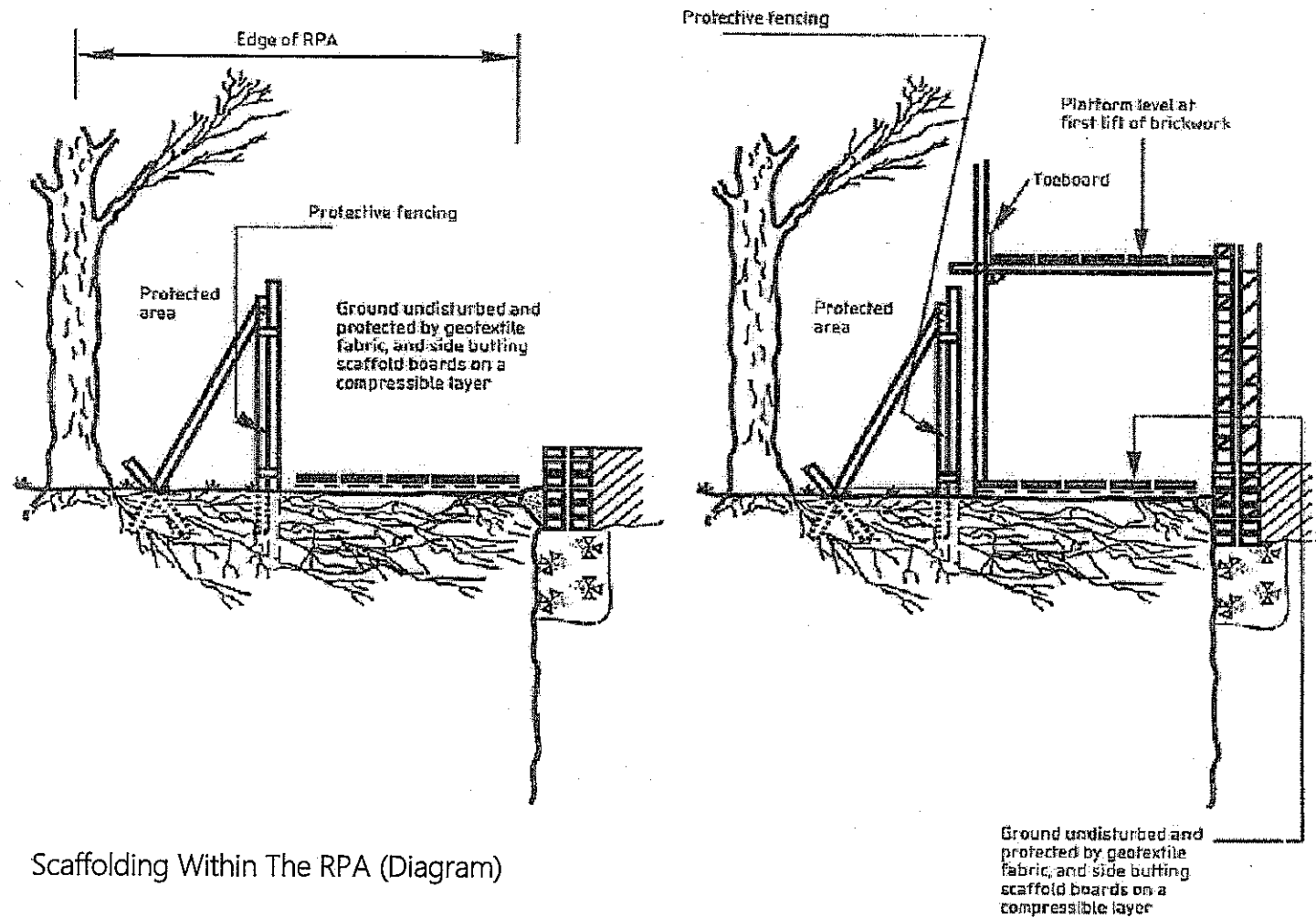
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- | | |
|--|--|
| 1 Standard scaffold poles | 5 Standard clamps |
| 2 Uprights to be driven into the ground | 6 Wire twisted and secured on inside face of fencing to avoid easy dismantling |
| 3 Panels secured to uprights with wire ties and, where necessary, standard scaffold clamps | 7 Ground level |
| 4 Weldmesh wired to the uprights and horizontals | 8 Approx. 0.6m driven into the ground |

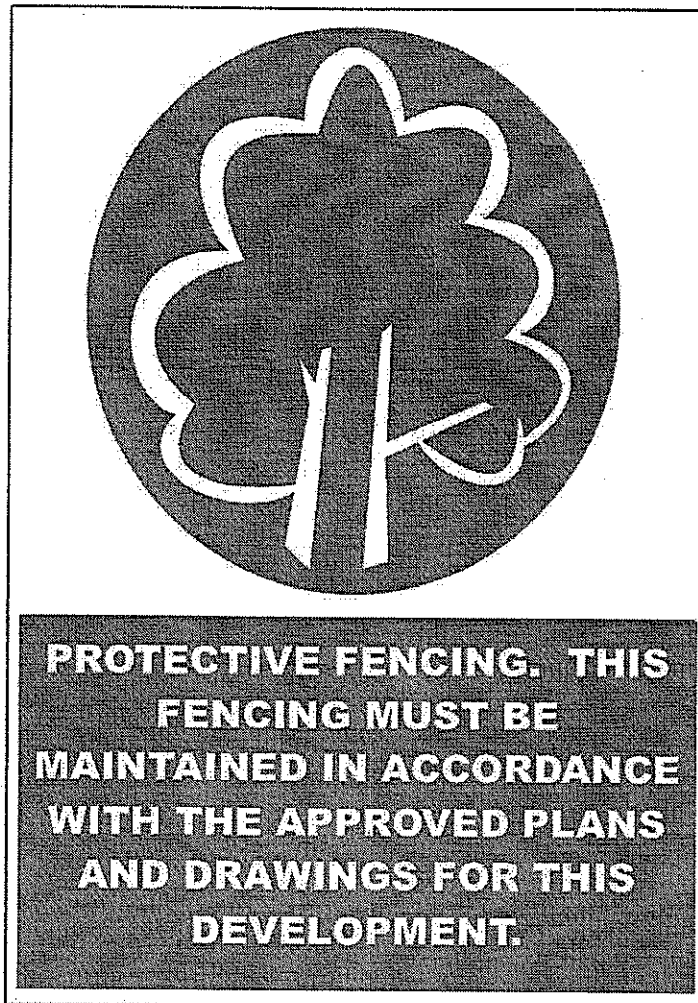
Tree Protection Fence (Diagram)

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Scaffolding Within The RPA (Diagram)

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Tree Protection Warning Sign

Abscission. The shedding of a leaf or other short-lived part of a woody plant, involving the formation of a corky layer across its base; in some tree species twigs can be shed in this way

Abiotic. Pertaining to non-living agents; e.g. environmental factors

Absorptive roots. Non-woody, short-lived roots, generally having a diameter of less than one millimetre, the primary function of which is uptake of water and nutrients

Adaptive growth. In tree biomechanics, the process whereby the rate of wood formation in the cambial zone, as well as wood quality, responds to gravity and other forces acting on the cambium. This helps to maintain a uniform distribution of mechanical stress

Adaptive roots. The adaptive growth of existing roots; or the production of new roots in response to damage, decay or altered mechanical loading

Adventitious shoots. Shoots that develop other than from apical, axillary or dormant buds; see also 'epicormic'

Anchorage. The system whereby a tree is fixed within the soil, involving cohesion between roots and soil and the development of a branched system of roots which withstands wind and gravitational forces transmitted from the aerial parts of the tree

Architecture. In a tree, a term describing the pattern of branching of the crown or root system

Axil. The place where a bud is borne between a leaf and its parent shoot

Bacteria. Microscopic single celled organisms, many species of which break down dead organic matter and some of which cause diseases in other organisms

Bark. A term usually applied to all the tissues of a woody plant lying outside the vascular cambium, thus including the phloem, cortex and periderm; occasionally applied only to the periderm or the phellem

Basidiomycotina (Basidiomycetes). One of the major taxonomic groups of fungi; their spores are borne on microscopic peg-like structures (basidia), which in many types are in turn borne on or within conspicuous fruit bodies, such as brackets or toothstools. Most of the principal decay fungi in standing trees are basidiomycetes

Balling. A term sometimes used to describe pollard heads

Bottle-butt. A broadening of the stem base and buttresses of a tree, in excess of normal and sometimes denoting a growth response to weakening in that region, especially due to decay involving selective delignification

Bracing. The use of rods or cables to restrain the movement between parts of a tree

Branch:

- **Primary.** A first order branch arising from a stem
- **Lateral.** A second order branch, subordinate to a primary branch or stem and bearing sub-lateral branches
- **Sub-lateral.** A third order branch, subordinate to a lateral or primary branch, or stem and usually bearing only twigs

Branch bark ridge. The raised arc of bark tissues that forms within the acute angle between a branch and its parent stem

Branch collar. A visible swelling formed at the base of a branch whose diameter growth has been disproportionately slow compared to that of the parent stem; a term sometimes applied also to the pattern of growth of the cells of the parent stem around the branch base

Brown-rot. A type of wood decay in which cellulose is degraded, while lignin is only modified

Buckling. An irreversible deformation of a structure subjected to a bending load

Buttress zone. The region at the base of a tree where the major lateral roots join the stem, with buttress-like formations on the upper side of the junctions

Cambium. Layer of dividing cells producing xylem (woody) tissue internally and phloem (bark) tissue externally

Canker. A persistent lesion formed by the death of bark and cambium due to colonisation by fungi or bacteria

Canopy species. Tree species that mature to form a closed woodland canopy

Cleaning out. The removal of dead, crossing, weak and damaged branches, where this will not damage or spoil the overall appearance of the tree

Compartmentalization. The confinement of disease, decay or other dysfunction within an anatomically discrete region of plant tissue, due to passive and/or active defences operating at the boundaries of the affected region

Compression strength. The ability of a material or structure to resist failure when subjected to

compressive loading; measurable in trees with special drilling devices

Compressive loading. Mechanical loading which exerts a positive pressure; the opposite to tensile loading

Condition. An indication of the physiological vitality of the tree. Where the term 'condition' is used in a report, it should not be taken as an indication of the stability of the tree

Construction exclusion zone. Area based on the Root Protection Area (in square metres) to be protected during development by the use of barriers and/or ground protection

Crown/Canopy. The main foliage bearing section of the tree

Crown lifting. The removal of limbs and small branches to a specified height above ground level

Crown thinning. The removal of a proportion of secondary branch growth throughout the crown to produce an even density of foliage around a well-balanced branch structure

Crown reduction/shaping. A specified reduction in crown size whilst preserving, as far as possible, the natural tree shape

Crown reduction/thinning. Reduction of the canopy volume by thinning to remove dominant branches whilst preserving, as far as possible, the natural tree shape

Deadwood. Dead branch wood

Decurrent. In trees, a system of branching in which there is a well-defined central main stem, bearing branches which are limited in their length, diameter and secondary branching (cf. excurrent). In fungi with toothstools as fruit bodies, the description of gills which run some distance down the stem, rather than terminating abruptly

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

Delamination. The separation of wood layers along their length, visible as longitudinal splitting

Dieback. The death of parts of a woody plant, starting at shoot-tips or root-tips

Disease. A malfunction in or destruction of tissues within a living organism, usually excluding mechanical damage; in trees, usually caused by pathogenic micro-organisms

Distal. In the direction away from the main body of a tree or subject organism (cf. proximal)

Dominance. In trees, the tendency for a leading shoot to grow faster or more vigorously than the lateral shoots; also the tendency of a tree to maintain a taller crown than its neighbours

Dormant bud. An axial bud which does not develop into a shoot until after the formation of two or more annual wood increments; many such buds persist through the life of a tree and develop only if stimulated to do so

Dysfunction. In woody tissues, the loss of physiological function, especially water conduction, in sapwood

DBH (Diameter at Breast Height). Stem diameter measured at a height of 1.5 metres (UK) or the nearest measurable point. Where measurement at a height of 1.5 metres is not possible, another height may be specified

Deadwood. Branch or stem wood bearing no live tissues. Retention of deadwood provides valuable habitat for a wide range of species and seldom represents a threat to the health of the tree. Removal of deadwood can result in the ingress of decay to otherwise sound tissues and climbing operations to access deadwood can cause significant damage to a tree. Removal of deadwood is generally recommended only where it represents an unacceptable level of hazard

Endophytes. Micro-organisms which live inside plant tissues without causing overt disease, but in some cases capable of causing disease if the tissues become physiologically stressed, for example by lack of moisture

Epicormic shoot. A shoot having developed from a dormant or adventitious bud and not having developed from a first year shoot

Excescence. Any abnormal outgrowth on the surface of tree or other organism

Excurrent. In trees, a system of branching in which the crown is borne on a number of major widely-spreading and secondarily branched limbs (cf. excurrent)

Felling licence. In the UK, a permit to fell trees in excess of a stipulated number of stems or volume of timber

Flush-cut. A pruning cut which removes part of the branch bark ridge and/or branch-collar

Girdling root. A root which circles and constricts the stem or roots possibly causing death of phloem and/or cambial tissue

Guying. A form of artificial support with cables for trees with a temporarily inadequate anchorage

Habit. The overall growth characteristics, shape of the tree and branch structure

Hazard beam. An upwardly curved part of a tree in which strong internal stresses may occur without being reduced by adaptive growth; prone to longitudinal splitting

Heartwood/false-heartwood/ripewood. Sapwood that has become dysfunctional as part of the natural aging processes

Heave. A term mainly applicable to a shrinkable clay soil which expands due to re-wetting after the felling of a tree which was previously extracting moisture from the deeper layers; also the lifting of pavements and other structures by root diameter expansion; also the lifting of one side of a wind-rocked root-plate

High canopy tree species. Tree species having potential to contribute to the closed canopy of a mature woodland or forest

Incipient failure. In wood tissues, a mechanical failure which results only in deformation or cracking, and not in the fall or detachment of the affected part

Included bark (ingrown bark). Bark of adjacent parts of a tree (usually forks, acutely joined branches or basal flutes) which is in face-to-face contact

Increment borer. A hollow auger, which can be used for the extraction of wood cores for counting or measuring wood increments or for inspecting the condition of the wood

Infection. The establishment of a parasitic micro-organism in the tissues of a tree or other organism

Internode. The part of a stem between two nodes; not to be confused with a length of stem which bears nodes but no branches

Lever arm. A mechanical term denoting the length of the lever represented by a structure that is free to move at one end, such as a tree or an individual branch

Lignin. The hard, cement-like constituent of wood cells; deposition of lignin within the matrix of cellulose microfibrils in the cell wall is termed lignification

Lions tailing. A term applied to a branch of a tree that has few if any side-branches except at its end, and is thus liable to snap due to end-loading

Loading. A mechanical term describing the force acting on a structure from a particular source; e.g. the weight of the structure itself or wind pressure

Longitudinal. Along the length (of a stem, root or branch)

Lopping. A term often used to describe the removal of large branches from a tree, but also used to describe other forms of cutting

Mature Heights (approximate):

- Low maturing – less than 8 metres high
- Moderately high maturing – 8 – 12 metres high
- High maturing – greater than 12 metres high

Micro drill. An electronic rotating steel probe, which when inserted into woody tissue provides a measure of tissue density

Minor deadwood. Deadwood of a diameter less than 25mm and or unlikely to cause significant harm or damage upon impact with a target beneath the tree

Mulch. Material laid down over the rooting area of a tree or other plant to help conserve moisture; a mulch may consist of organic matter or a sheet of plastic or other artificial material

Mycelium. The body of a fungus, consisting of branched filaments (hyphae)

Ocluding tissues. A general term for the roll of wood, cambium and bark that forms around a wound on a woody plant (cf. wound wood)

Occlusion. The process whereby a wound is progressively closed by the formation of new wood and bark around it

Pathogen. A micro-organism which causes disease in another organism

Photosynthesis. The process whereby plants use light energy to split hydrogen from water molecules, and combine it with carbon dioxide to form the molecular building blocks for synthesizing carbohydrates and other biochemical products

Phytotoxic. Toxic to plants

Pollarding. The removal of the tree canopy, back to the stem or primary branches. Pollarding may involve the removal of the entire canopy in one operation, or may be phased over several years. The period of safe retention of trees having been pollarded varies with species and individuals. It is usually necessary to re-pollard on a regular basis, annually in the case of some species.

Primary branch. A major branch, generally having a basal diameter greater than 0.25 x stem diameter

Primary root zone. The soil volume most likely to contain roots that are critical to the health and stability of the tree and normally defined by reference to Table 1 of BS5837 (1991) Guide for Trees in Relation to Construction

Priority. Works may be prioritised, 1 = high, 5 = low

Probability. A statistical measure of the likelihood that a particular event might occur

Proximal. In the direction towards front the main body of a tree or other living organism (cf. distal)

Pruning. The removal or cutting back of twigs or branches, sometimes applied to twigs or small branches only, but often used to describe most activities involving the cutting of trees or shrubs

Radial. In the plane or direction of the radius of a circular object such as a tree stem

Rams-horn. In connection with wounds on trees, a roll of occluding tissues which has a spiral structure as seen in cross-section

Rays. Strips of radially elongated parenchyma cells within wood and bark. The functions of rays include food storage, radial translocation and contributing to the strength of wood

Red-rot. A form of decay in which reddish pigments are present but which is biochemically a white-rot; not to be confused with brown-rots which sometimes also have a reddish brown colour

Reactive Growth/Reaction Wood. Production of woody tissue in response to altered mechanical loading; often in response to internal defect or decay and associated strength loss (cf. adaptive growth)

Removal of dead wood. Unless otherwise specified, this refers to the removal of all accessible dead, dying and diseased branchwood and broken snags

Removal of major dead wood. The removal of, dead, dying and diseased branchwood above a specified size

Respacing. Selective removal of trees from a group or woodland to provide space and resources for the development of retained trees

Residual wall. The wall of non-decayed wood remaining following decay of internal stem, branch or root tissues

Root-collar. The transitional area between the stem/s and roots

Root-collar examination. Excavation of surfacing and soils around the root-collar to assess the structural integrity of roots and/or stem

Root protection area. An area of ground surrounding a tree that contains sufficient rooting volume to ensure the tree's survival. Calculated with reference to Table 2 of BS5837 (2005) and shown in plan form in square metres

Root zone. Area of soils containing absorptive roots of the tree/s described

microscopic and dispersed in air or water. The Primary root zone is that which we consider of primary importance to the physiological well-being of the tree

Sapwood. Living xylem tissues

Secondary branch. A branch, generally having a basal diameter of less than 0.25 x stem diameter

Selective delignification. A kind of wood decay (white-rot) in which lignin is degraded faster than cellulose

Shedding. In woody plants, the normal abscission, rotting off or sloughing of leaves, floral parts, twigs, fine roots and bark scales

Silvicultural thinning. Removal of selected trees to favour the development of retained specimens to achieve a management objective

Simultaneous white-rot. A kind of wood decay in which lignin and cellulose are degraded at about the same rate

Snag. In woody plants, a portion of a cut or broken stem, branch or root which extends beyond any growing point or dormant bud; a snag usually tends to die back to the nearest growing point

Soft-rot. A kind of wood decay in which a fungus degrades cellulose within the cell walls, without any general degradation of the wall as a whole

Spores. Propagules of fungi and many other life-forms; most spores are shrub species. Woody perennial species forming the lowest level of woody plants in a woodland and not normally considered to be trees

Sporophore. The spore bearing structure of fungi

Sprouts. Adventitious shoot growth erupting from beneath the bark

Stem/s. The main supporting structure/s from ground level up to the first major division into branches

Stress. In plant physiology, a condition under which one or more physiological functions are not operating within their optimum range, for example due to lack of water, inadequate nutrition or extremes of temperature

Stress. In mechanics, the application of a force to an object

Stringy white-rot. The kind of wood decay produced by selective delignification

Storm. A layer of tissue which supports the fruit bodies of some types of fungi, mainly ascomycetes

Structural roots. Roots, generally having a diameter greater than ten millimetres, and contributing significantly to the structural support and stability of the tree

Subsidence. In relation to soil or structures resting in or on soil, a sinking due to shrinkage when certain

types of clay soil 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

Taper. In stems and branches, the degree of change in girth along a given length

Target canker. A kind of perennial canker, containing concentric rings of dead occluding tissues

Targets. In tree risk assessment (with slight misuse of normal meaning) persons or property or other things of value which might be harmed by mechanical failure of the tree or by objects falling from it

Topping. In arboriculture, the removal of the crown of a tree, or of a major proportion of it

Torsional stress. Mechanical stress applied by a twisting force

Translocation. In plant physiology, the movement of water and dissolved materials through the body of the plant

Transpiration. The evaporation of moisture from the surface of a plant, especially via the stomata of leaves; it exerts a suction which draws water up from the roots and through the intervening xylem cells

Understorey. A layer of vegetation beneath the main canopy of woodland or forest or plants forming this

Understorey tree species. Tree species not having potential to attain a size at which they can contribute to the closed high canopy of a woodland

Vascular wilt. A type of plant disease in which water-conducting cells become dysfunctional

Vessels. Water-conducting cells in plants, usually wide and long for hydraulic efficiency; generally not present in coniferous trees

Veteran tree. A loosely defined term for an old specimen that is of interest biologically, culturally or aesthetically because of its age, size or condition and which has usually lived longer than the typical upper age range for the species concerned

White-rot. A range of kinds of wood decay in which lignin, usually together with cellulose and other wood constituents, is degraded

Wind exposure. The degree to which a tree or other object is exposed to wind, both in terms of duration and velocity

Wind pressure. The force exerted by a wind on a particular object

Wind throw. The blowing over of a tree at its roots

Wound dressing. A general term for sealants and other materials used to cover wounds in the hope of protecting them against desiccation and infection; only of proven value against fresh wound parasites

Woundwood. Wood with atypical anatomical features, formed in the vicinity of a wound

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