BS5837:2012 TREE SURVEY PLANNING REPORT

BELLEFIELD ROAD LANARK

For

MARCHSTONE BELLEFIELD LIMITED

Prepared by

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Issue 02 PLANNING
21 MAY 2019

Document Control Sheet

Project Title: BELLEFIELD ROAD LANARK
Scheme No. 145
Report Title: BS5837:2012 TREE SURVEY PLANNING REPORT
Issue 02
Status: PLANNING

Record of Issue

Issue	Status	Author	Date	Check	Date	Authorised	Date
01	DRAFT	Keith Vernon	01.03.19	John Gunning	01.03.19	Keith Vernon	01.03.19
02	Planning	Keith Vernon	20.05.19	John Gunning	21.05.19	John Gunning	21.05.19

Issue Details

Issue	Details	Date
01	Issue for comment	01.03.19
02	Issue for Planning	21.05.19

Distribution

Organisation	Contact	Copies
Marchstone Bellefield Limited	John Gunning	1 electronic
South Lanarkshire Council		

BELLEFIELD ROAD LANARK
BS5837:2012 Tree Survey

Survey Limitations: Unless otherwise stated all trees have been surveyed from ground level using non-invasive techniques, in sufficient detail to gather data for and inform the design of the above project only. The disclosure of hidden crown and stem defects, in particular where they may be above a reachable height or where trees are ivy covered or in areas of overgrown vegetation, cannot therefore be expected. All obvious defects, however, are reported. Detailed climbed tree safety appraisals are only carried out under specific written instructions.

Comments on evident tree safety relate to the condition of the identified trees at the time of the survey only. Unless otherwise stated all trees should be re-inspected annually in order to re-appraise their on-going mechanical integrity and physiological condition. It should, however, be recognised that tree condition is subject to change, for example due to the effects of disease, decay, high winds, development works, etc. Changes in land use or site conditions (e.g. development that increases access frequency) and the occurrence of severe weather incidents are also significant considerations with regards tree structural integrity and trees should therefore be re-assessed in the context of such changes and/or incidents and inspected at intervals relative to identified and varying site conditions and associated risks.

Where trees are located wholly or partially on neighbouring private third-party land then said land is not accessed and our inspection is therefore restricted to what can reasonably be seen from within the site. Stem diameters of trees located on such land are estimated. Any subsequent comments and judgments made in respect of such trees are based on these restrictions and are our preliminary opinion only. Recommendations for works to neighbouring third-party trees are only made where a potentially unacceptable risk to persons and/or property has been identified during our survey or, if applicable, where permissible works are required to implement a proposed development. Where significant structural defects on third-party trees are identified and associated management works are considered essential to negate any risk of harm and/or damage then we will first attempt to inform the site occupier of the issues and, if not possible, then inform the relevant authority.

Where a more detailed assessment is considered necessary then appropriate recommendations are set out in the Tree Survey Schedule. Where tree stem locations are not included on the plan(s) provided then they are plotted at the time of the survey using, where appropriate and/or practicable, a combination of measurement triangulation and GPS co-ordination.

The author: The author is a Chartered Landscape Architect, Chartered Environmentalist, Chartered Horticulturist and Professional member of the Arboricultural Association. He has extensive experience of working with and alongside local authority Planning Development Departments, preparing a range of large scale landscape projects, often constructed adjacent woodlands and/or part of former country estates. Work of this nature requires a working knowledge of relevant planning legislation, experience of preserving trees on development sites through BS5837:2012 Trees in Relation to Design, demolition and construction - Recommendations and having qualifications in Arboriculture and Professional Tree Inspection. Beyond Landscape, Arboricultural and Horticultural experience, the author is qualified in the preparation and management of an OHSAS 18001:2007 Occupational Health and Safety Management system, where thhi is involved in assessment of hazard and risk, legislative requirements and internal audit to assess the ongoing efficacy of the Management System.

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1. Introduction

The brief of this Tree Survey is to satisfy the requirements of the planning condition described in CL/11/0278 and amended application CL/14/0444 by presenting a BS5837:2012 Tree Survey report that has assessed the health, vitality and structural integrity of the trees in relation to the proposed residential development at Bellefield Road Lanark.

This survey has been commissioned by Marchstone Bellefield Limited[1]. The trees surveyed are identified within the tree schedule report in Appendix A and located at grid reference NS 88337 44957[2]. The trees surveyed are predominately outwith the site boundary of the development, however, there is a risk of an impact on the root areas of trees from development works. The trees surveyed are categorised in accordance with Appendix B to give context to the overall arboricultural value, life expectancy and benefit to the landscape.

The report will describe a process of tree protection and tree enhancement that will support the planning application for the development proposed by Marchstone Bellefield Limited and the planning process in respect of trees and landscape,[3] as described within The Town & Country Planning (Development Management Procedure)(Scotland) Regulations 2013.[4]

The Tree survey report refered to has been compiled in conjunction with the methods and procedures contained within the Arboricultural Association document, Guide to Tree Survey and Inspection[5], in accordance with the VTA (Visual Tree Assessment) Stage 1 assessment [6], and with The Principles of Tree Hazard Assessment and Management[7].

With reference to the identification and naming of the species herein, the Illustrated Trees of Britain and Europe has been used to confirm survey species records[8].

With refrence to the identification and naming of decay and structurally debilitating fungi, The Body Language of Trees has been used to confirm species records[9]

The orginal survey consists of an inspection of 56 individual trees with an age range 25 - 150 (estimated) years.

[1] 29 Brandon Street, Hamilton, South Lanarkshire, ML3 6DA
[2] http://gridreferencefinder.com/
[3] Town & Country Planning (Scotland) Act 1997 Section 159(a)
[4] Town & Country Planning (Development Management Procedure)(Scotland) Regulations 2013 12 (2)(d)(i) and 12(3)
[5]Fay, N, Dowson, D, Helliwell, R. Tree Survey & Inspection. Arboricultural Association. Romsey. 2005.
[6] Matheck, C. Guide to Visual Tree Inspection, Arboricultural Association. Romsey 1994
[7]Lonsdale, D. Principles of Hazard Assessment & Management. The Stationary Office. London 2001
[8] More, D; White, J. (2013) Illustrated Trees of Britain and Europe. London. Bloomsbury
[9] Mattheck, C. The Body Language of Trees – Encyclopaedia of Visual Tree Assessment. KIT. Karlsruhe.2015.

The following trees were surveyed, where tree genus and species are shown in ***bold italics***, where the numbers requiring removal are in brackets after the common name.

No	Genus/ species	Common name	Removal
1no	***Acer platanoides***	Norway Maple	(0)
15no	***Acer pseudoplatanus***	Sycamore	(8)
2no	***Betula pendula***	Silver Birch	(2)
7no	***Fraxinus excelsior***	Ash	(1)
4no	***Larix decidua***	Larch	(1)
8no	***Picea abies***	Norway Spruce	(4)
9no	***Pinus sylvestris***	Scots Pine	(1)
9no	***Populus tremula***	Aspen	(9)
1no	***Sorbus aucuparia***	Rowan	(1)
0no	Fraxinus excelsior scrub		
0no	Crataegus monogyna scrub		
56no	Total		

2. Executive summary

This tree survey and planning report largely refers to trees and woodlands outwith the development site boundary that may be impacted upon during the construction phase.

The trees referred to are, the woodland edge on the west of the site and the former policies of Bellefield House, the roadside edge, the east boundary and properties of Birch Tree Cottage and Marchview House, and the Ancent woodland and PAWS woodland.

The report sets out a detailed framework using BS5837:2012 criteria to demonstrate a full and consise approach to the protection of not only the trees during construction, but also advocating responsible aftercare, and replanting.

The trees surveyed were categorised based on the criteria from an arboricultural and landscape value, taking into consideration size, stature and rareity throughout the site. The survey categorised 1 tree at A, 8 trees at B and 34 trees at C, where 14 trees have been selected for removal,13 as U and 1 as C.

The following trees have been scored with a high hazard/ risk value. These trees should be treated as priority for removal/ work.

Legend: Age Class: YT=Young Tree; SM=Semi Mature; M=Mature; FM- Fully Mature; OM=Over mature; BS5837 Category: A=High Value; B=Moderate value; C=Low Value; U=Unsuitable/ No Value; NOD=no obvious defects; NMD=No Major Defects; **Works**: NWR=No work required; DW=Dead wood; CC=Crown Clean; CL=Crown Lift; CR=Crown Reduce; CT=Crown Thin; SR=Structural Repairs; SD=Storm damage; HB=Hazard Beam; R=Remove Tree; ST=Standing timber to 7m; P=pollard; RE=Remove epicormic growth; RI remove ivy; RH=Remover hangers; FIR=Further Inspection Required; Mo=Monitor as indicated; BIR=Bat inspection required; RP=Root protect; IC=Inspect cavity; L2C3=Likelihood & Consequence of failure: Life expectancy based following works carried out; ± = estimated value.

Tree tag number	Genus/ Species	Common name	Root plate zone condition/ comments	Tree description/ comments	Vigour/ Health	Structural issues	NESW Crown radii ±				Dia@1.5m (mm)	Height (m)	Age Class	Age ±	BS5837 Cat	Life expectancy (yrs)	Hazard Likelihood	Risk Consequence	HRV	Recommended works - BS3998:2010	RPA (m)	Inspect Frequency (month)
1706	Fraxinus excelsior	Ash	undergrowth	Poor leaning tree to east dense ivy stem bends compensatory buttresses to west	poor	lean	6	8	0	0	450	17	M	57	U	0	4	4	16	R		
1767	Acer pseudoplatanus	Sycamore	Roadside verge	Average condition some dv lean tow ard road buttressed lifted on west ballacing back to west	poor ave	lean	6	6	4	5	470	16	EM	59	C	10	3	4	12	R		
1768	Fraxinus excelsior	Ash	Roadside verge	Veteran ash dense ivy multiple storm damage broad canopy stem bulge reinspect	slowing down	Storm damage	9	7	9	9	1270	19	V	160	A	40	3	4	12	RI, reinspect	15.2	18
1769	Fraxinus excelsior	Ash	Roadside verge	Dense ivy and deadwood throughout; dense growth made the tree difficult to survey	slow	ivy	5	6	6	5	950	17	OM	119	B	20	3	4	12	RI, Reinspect	11.4	18
1715	Larix decidua	Larch	field	Poor tree significant lean to east	poor	poor condition	0	0	0	0	0	nr	EM	0	U	0	3	4	12	R		

3. Scope of Report

The scope of the survey report is set out using the BS5837:2012 sections, reporting on information gathered on tree genus and species, health condition, hazard and risk and suitablility for retention of the trees in relation to the proposed development, based on BS5837:2012 Trees in relation to design, demolition and construction – Recommendations[10]. The survey will identify trees in poor health and those which can be realistically preserved during and following the construction period, both within and outwith the development site. The retained trees would continue to contribute to the landscape as well as providing a soft backdrop and shelter to the proposed development. The survey area is shown below in Figure 1.

In accordance with the guidance in BS5837:2012, table 3.1 has been included to show the scope of the report information.

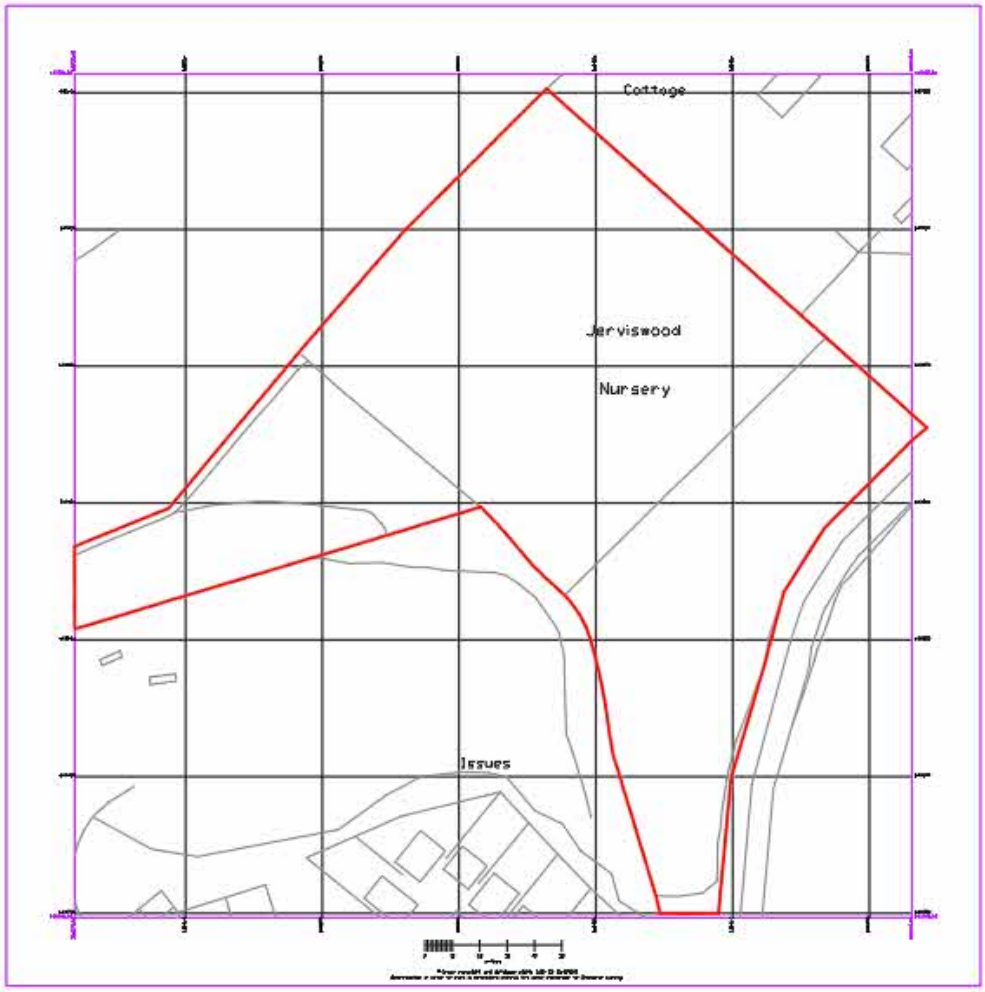

Figure 1 Site boundary TLC OS Licence 100057899

[10] https://shop.bsigroup.com/ProductDetail/?pid=000000000030213642

3.1 Delivery of tree-related information into the planning system (table B1)

Stage in Process	Expected detail		Additional Information	
Pre application	x	Tree Survey	x	Tree retention/ removal plan
Planning application	√	Tree Survey – 145(S)100_01A	√	Existing and proposed finished levels 145(S)100_03A
	√	Tree retention/removal plan (finalised) – 145(S)100_02A	√	Tree Protection Plan (TPP) – 145(S)100_03A – 145(S)100_04A
	√	Retained trees and soft landscape design, including species and location of new tree planting – 145(L)100_05A	√	Arboricultrual Method Statement (AMS) – heads of terms – Section 6
	√	Arboricultural Impact Assessment (AIA) – Section 5	√	Details of all special engineering within the Root Protection Area (RPA) and other relevant construction details – 145(S)100_03A – 145(S)100_04A
Reserved matters/ planning conditions		Alignment of utility apparatus (including drainage), where outside the RPA or where installed using a trenchless method		Arboricultural site monitoring schedule
		Dimensioned TPP		Tree and landscape management plan
		AMS –detailed		Post-construction remedial works
		Schedule of works to retained trees, e.g. access facilitation pruning		Landscape maintenance schedule
		Detailed hard and soft landscaping design		

3.2 Limitations

The development site and environs lie within the boundaries of the former Mansion of Bellefield House and policies (circa 1830). The remnant grounds following the nearby housing developments have left the former policies in a poor and neglected state , which at times was difficult to access and traverse. In many cases dense Ivy (Hedra helix) has

engulfed the larger trees, making an assement of tree health and the reporting of defects unrelilable.

The survey data was collected using a Trimble TDC100 using Korec K-Mobile software.[11] The survey accuracy is satalite dependant, where accuracy is reported between 650 – 1000mm. Where possible the tree data points have been aligled with the development topography/ survey drawing to show exact tree tag numbers positions.

[11] https://www.korecgroup.com/product/k-mobile-software/ v4.2.42

4. Feasibility: surveys & preliminary constraints

4.1 General: Methodology

All trees were assessed visually for outward signs of stress, poor development, structural defects, deadwood, hung up limbs and presence of decaying fungal fruiting bodies. Each tree was measured, where practicable using a TruPulse 200 laser inclinometer– to measure tree height and crown spread. Stem/ trunk diameter was measured at 1.5m using a girth/ diameter tape. The tree diameter can be used ascertain estimated age, where (stem girth (cm) ÷ 2.5cm = estimated age) and to determined extent of the root protection areas, where for single stemmed trees (Stem diameter (girth÷3.14) (cm) x 12)=RPA m. Each tree was sounded using a rubber mallet to determine the presence of cavities and potential structural weaknesses. Each tree location was located and positioned using a Trible TDC 100 Handheld GPS Device, and identified with an aluminium tree tag, this information is presented on a digital georeferenced Ordnance Survey map overlaid onto the topographical site survey drawing to confirm accurate tree positions.

The survey details information on tree genus and species, height, girth/diameter at 1.5m, crown spread, clear stem height, root plate zone condition, age classification and BS5837 category, and the specifying of all resulting necessary arboricultural works (Appendix A). The recommended works will identify the removal of trees considered either, unrealistic to retain during the construction of the development or which pose an immediate hazard. Where trees have been identified for retention within the survey area, a range of recommended arboricultural works have been specified, including structural and routine repairs to ensure these trees are relatively free from defects, reducing the hazard risk of these trees in relation to the public and property. Every retained tree will show a Root Protection Area (RPA) and exclusion zone. The extent of RPA is calculated, based on a radius 12 x the stem diameter around the tree.(Appendix D 145(S)100_01 – 03A).

All trees carry a retention category of A, B, or C and U category for unsuitable. (Appendix B) This gives an indication of the trees condition and amenity and landscape value at time of survey, along with a perceived BS5837 life expectancy.

The Occupiers Liability (Scotland) Act 1960, advises owners to take cognisance of the following; “It is reasonable that decisions regarding tree safety are considered against a background of the general low risk from falling trees. Being reasonable involves taking actions proportionate to the risk”. The Hazard Risk matrix will identify an associated level of risk for each tree surveyed (Figure 2).

All works identified as a result of the survey shall be carried out in conjunction with BS3998:2010 Tree Work - Recommendations and carried out by an approved contractor.

The findings of the tree survey will strike a balance between the risks and the benefits associated with each tree. This balance is based on a risk assessment involving a risk-benefit trade-off between safety and preservation of the trees within the development site. The schedule shows the scoring of likelihood and consequence for each tree, to ensure a pragmatic decision has been recorded.

The recommendations within this report are are valid for the next 18 months from the report date.

4.1.1 Hazard & Risk

In addition to the paramters of BS5837:2012, each tree was scored to assess the potential to cause harm based on the matrix below.

Likelihood of tree failure	5	Evidence of advanced decay and imminent structural failure and collapse	5	10	15	20	25
	4	Evidence of significant infection of known decay fungi, displaying symptoms of advancing decay, weakness and tree failure likely	4	8	12	16	20
	3	Indication of fungal infection, cavities, stem defects and upper and lower crown hazards. The failure of the tree is not considered imminent.	3	6	9	12	15
	2	Partial loss of structural integrity through ground movement, lean or vulnerability. The tree is considered a low risk of failing.	2	4	6	8	10
	1	No obvious loss of structural integrity and no apparent structural defects. The tree is considered a low risk of failing	1	2	3	4	5
Hazard/ Risk value. Likelihood x Consequence = HRV Recommended actions 1-2: No work. 3-9: Carry out a range of structural repairs to damaged tree parts, crown reduction and thinning and monitoring works as required. 10-12: Carry out urgent remedial works to reduce HRV value through the removal of tree or tree parts. 15-25: Remove as recommended / standing timber			Target area includes no obvious level of perceived risk or target area	Target area includes minor trafficking by small and minimal pedestrian use on a informal path and informal road ways, field entrances and dirt tracks used by vehicles.	Target area includes minor formal paths, C class and unclassified roads with minimal vehicle use, includes carparks, outbuildings and sheds – injury to people and damage to property	Target area includes major formal pavements, A & B class roads with regular vehicle use, includes Houses, property – includes increase risk of injury to people and property risk of death	Target area includes highspeed Trunk road and Motorway, with high levels of pedestrian and vehicle use – includes a significant risk of injury and death and significant damage to property
			1	2	3	4	5
			Consequence of tree failure				

Figure 2 Hazard Matrix

No tree is entirely safe, given the possibility that an exceptionally strong wind could damage or uproot even a mechanically 'perfect' specimen. It is therefore usually accepted that hazards are only recognisable from distinct defects or from other failure-prone characteristics of the tree or of the site[12].

The assessment of risk is based on:

[12] https://www.forestry.gov.uk/pdf/FCMS024.pdf/$FILE/FCMS024.pdf

• The value of whatever is judged to be at risk, and the likelihood of its being harmed in the event of mechanical failure in the tree, as estimated by:

- what is at risk - people, buildings, vehicles, etc.

- the probability of impact, based on duration of occupation - for example, in relation to a permanent structure or a given number of people using a path during a given period of time.

(These considerations are clearly linked to the location of the tree, which is a key factor in deciding whether inspection is required in the first place.)

• The magnitude of the hazard, as estimated from the size (diameter) and height of the part of the tree most likely to fail.

• The probability of failure, based on the type, position and severity of the defect concerned, the species or cultivar of tree and the nature of the site. The following need to be taken into account:

- some types of defect are more likely than others to lead to failure; for example, forks with included bark account for a high proportion of above-ground failures, whereas zones of decay in stems and branches generally cause serious weakening only if they occupy a large proportion of the cross-sectional area. The assessment of decay generally requires a measurement of the extent and position of the remaining sound wood;

- if the defect is associated with decay, identification of the fungus responsible may be desirable. There are a number of types of decay (including the broad categories of ‘white rots’ whose mechanical properties are different enough to affect the likelihood of failure in some cases;

- some species or cultivars of tree are known to be weakened more than others by certain types of growth-related defect or by particular species of decay fungus;

- a number of site factors affect the likelihood of failure, including exposure to wind (especially any recent alteration in exposure) and the depth of the soil available for rooting.

The Tree survey factored in the above methodology, in conjunction with the requirements of VTA Stage 1. The process also factored in 30 years of experience and knowledge from the author to determine the extent of reasonable risk from tree failure.

4.2 Topographical survey

A topographical drawing was provided by the Client showing the extent of the site boundary, contours at 500mm, site features, position of trees considered important and the edge of scrub planted areas. This drawing has been used for the base tree survey drawing.

4.3 Soil assessment

The soil content is essentially a brown soil[13] formed over a Devensian glacial till.[14] There are two underlying bedrock types; Wiston grey volcaniclastic sandstone and Lawmuir formation of mudstone, siltstone, sandstone with seatearths, coals and marine limestones. Marine bands in upper part, conglomerate in lowest part in some areas[15]. The upper section of the site are a free draining soil as refered to above, where lowerer levels are somewhat waterlogged. This may be attributed to the historic curling pond constuction.

The soil types are of loam, gravel and sand composition, these soils are not considered shrinkable. Scotland is not known for having issues with shrinkable soils.[16]

4.4 Tree survey

The survey was carried out on Monday 18, Tuesday 19 and 20 February 2019. The survey was carried out from ground level.

The survey area consists of rolling agricultural grazing land, edged by an Ancient woodland and PAWS[17] to the north-west, shelter belt plantation to the east containing several large Pine, Larch and Fir, and a roadside Veteran Ash. Within the site there is a plantation of Norway Fir planted for the production of Christmas trees and various Hawthorn and Ash scrub regeneration.

The report consists of observations made in accordance BS5837:2017 and the VTA Visual Tree Assessment Stage 1, where 56 trees were assessed, see 145 Tree survey schedule (Appendix A), each tree was categorised to determin life expectancy and quality, see tree categories (Appendix B), Tree survey area is shown in drawing 145(S)100_01A (Appendix C). There are 27 trees identified for removal, see tree removal drawing 145(S)100_02A (Appendix D), and 29 trees for retention that can be successfully protected during the development, see tree protection drawing 145(S)100_03A & 145(S)100_04A (Appendix E).

The tree survey area is essentially an unmanaged 150 years woodland policy on the boundary of the development site, that has been neglected for many years. These trees over time shall prove hazardous to the occupiers of the development and a range of structural repairs and essential arboricultural works be carried out prior to the development of the site.

[13] http://map.environment.gov.scot/Soil_maps/?layer=1
[14] http://mapapps.bgs.ac.uk/geologyofbritain/home.html
[15] https://www.bgs.ac.uk/lexicon/lexicon.cfm?pub=LWM
[16] https://www.bgs.ac.uk/downloads/start.cfm?id=240 · PDF file
[17] https://www.woodlandtrust.org.uk/visiting-woods/trees-woods-and-wildlife/woodland-habitats/ancient-woodland/

4.5 Tree categorisation

The trees surveyed have been catogorised based on the criteria from an arboricultural and landscape value, taking into consideration size, stature and rareity throughout the site. The survey categorised 1 tree at A, eight trees at B and 34 trees at C, where 27 trees have been selected for removal and 13 as U and 14 as C.

4.6 Root protection area (RPA)

All 29 trees identified for retention have root protection areas identified on drawing 145(S)100_03A & 145(S)100_04A, where the proposed development shows no potential for impact within the RPAs. All RPA have been calculated based on 12 x the stem diameter at 1.5m. Drawing 145(S)100_03A shows the impact from the earth works and road way construction. Drawing 145(S)100_04A shows the impact from the entire development. Showing both elements together was confusing.

Regarding the Ancient woodland and PAWS a Forestry Commission assessment guide has been applied to assess the potential impacts, where a buffer zone of 3.5m is recommended. 6.2 Barriers apply. The assessment document is contained in Appendix F.

5. Proposals: conception & design

5.1 General

The proposed development poses no immediate impacts on below or above ground features including drains, services and tree roots. Tree 1767 ***Acer pseudoplatanus*** requires removal to facilitate the access to the site from the main road.

5.2 Constraints posed by existing trees

As described above the RPAs are unaffected by the development footprints, however, the exclusion zone will ensure the RPA remain protected. The protection of the Ancient woodland will impose a buffer zone as indicated.

5.3 Proximity of structures to trees

There are appreciable structures other than the low wall on the north-west boundary that demarcates the Ancient woodland and PAWS (Plantation on Ancient Woodland). These areas shall be protected by the appropriate barriers on the extent of the buffer zone.

5.4 Arboricultural impact assessment (AIA)

5.4.1 The following AIA taken into account the observations reached in 5.2 above.

5.4.2 The assessment takes into account of the effects of the 27 tree losses required to implement the proposed design, and the potentially damaging activities proposed in the vicinity of retained trees and the ancient woodland area.

Drawing 145(S)100_03A shows the proposed development footprint and the relationship to the Exclusion Zone, with further recommendations made for mitigation of excavation and ground protection.

The proposed development activities include the removal of a range of scrub vegetation, trees either dangerous or that have collapsed and a number of self-sown Ash and Aspen

No further investigation is required into the location and dimensions of all proposed excavations or changes in ground level associated with foul disposal, as all works are out with the exclusion zones

The impact of the permanent works shall be contained out with the Exclusion zone with a full environmental assessment of spillages, dusts and storage of materials during the construction period. This shall factor in the buildability of the development in terms of access, adequate working space and provision for the storage of materials, including topsoil. This AIA contains the following:

a) the tree survey – 145(S)100_01A carried out in accordance with 4.4;

b) trees selected for retention, clearly identified (e.g. by number) and marked on a plan with a continuous outline – 145(S)100_03A – 04A;

c) trees to be removed, also clearly identified (e.g. by number) and marked on a plan with a dashed outline or similar – 145(S)100_02A;

d) trees to be pruned, including any access facilitation pruning, also clearly identified and labelled or listed as appropriate - 145(S)100_03A;

e) areas designated for structural landscaping that need to be protected from construction operations in order to prevent the soil structure being damaged – 145(S)100_03A – 145(S)100_04A;

f) evaluation of impact of proposed tree losses – The proposed tree losses are projected at just under 48% in terms of numbers.

g) evaluation of tree constraints and draft tree protection plan – 145(S)100_03A – 145(S)100_04A;

h) issues to be addressed by an arboricultural method statement, see section 6.

5.5 Tree protection plan

Drawing 145(S)100_03A – 04A shows the extent of the individual RPA and the exclusion zone, along with the barrier construction. There are additional measures applied for the protection of the ancient woodland areas.

5.6 New planting design/ landscape operations

Landscape designs to be developed following agreement with the proposal and the recommendations for tree removal. A preliminary tree planting drawing show possible species for selection and location, 145(S)100_06 (Appendix G). The proposal shall facilitate to transfer of cold air falling[18] down through the site.

[18] https://en.wikipedia.org/wiki/Katabatic_wind

6. Technical design

Technical design in reference to this report is framed around the topography drawing and the clients aspirations for the development shows in the proposed layout in relation to site contours and the requirements to ensure that tree protection during the development to completion can be implemented successfully. The survey report and the investigation into the impacts on the remaining trees and a mitagative strategy are set out in this technical design section. At this stage the proposals are subject to consultation and agreement with the Planning authority and Tree Officer regarding being appropriate, measured and acceptable.

6.1 Arboricultural method statement (AMS)

6.1.1 Precautions: Drawing 145(S)100_03A – 145(S)100_04A shows the extent of each trees Root Protection Area (RPA), all of which are behind the line of the exclusion zone. Each drawing shows the roadway and soil works, along with the housing in drawing 145(S)100_04A. This facilitates enough room for demolition (soil stripping and ground modling), construction and the storage of materials without causing damage to any tree roots and canopies within the exculsion zone.

6.1.2 Demolition: Drawing 145(S)100_03A – 145(S)100_04A shows the proposed development and soiling works. The principle protection area alongside the west boundary, entrance area, the east boundary and the north-west ancient woodland edge.

a) removal of existing structures and hard surfacing are indicated. There are no obvious structures to ne removed.

b) installation of temporary ground protection. No requirement.

c) excavations and the requirement for specialised trenchless techniques. No requirement.

d) installation of new hard surfacing – materials, design constraints and implications for levels; as shown all new hardstanding areas are outwith the exclusion zone.

e) specialist foundations – installation techniques and effect on finished floor levels and overall height, not considered necessary;

f) retaining structures to facilitate changes in ground levels, the retaining structures are outwith the exclusion zone;

g) preparatory works for new landscaping; all landscape areas outwith the exclusion zone.

h) auditable/audited system of arboricultural site monitoring, including a schedule of specific site events requiring input or supervision; AMS audit system to be agreed prior to construction works..

6.1.3 The arboricultural method statement should also include a list of contact details for the relevant parties; to be agreed.

6.2 Barriers & ground protection

6.2.1.1 All trees are being retained on site shall be protected by barriers and/or ground protection as described and shown on drawing 145(S)100_03A & 145(S)100_04A and figure 3 below.

6.2.1.2 All existing retained trees are within the exclusion zone.

6.2.1.3 The protected area shall be sacrosanct and only accessable via a padlocked gate. Not materials shall be stored where spillages will run within the exclusion zone. Spill kits will be available onsite at all times.

6.2.1.4 Where required, pre-development tree work shall be undertaken before the installation of tree protection measures, this shall be coordinated prior to the installation of the protective fence.

6.2.1.5 The project arboriculturist shall approve and sign off on the RPA and exclusion area with the project architect.

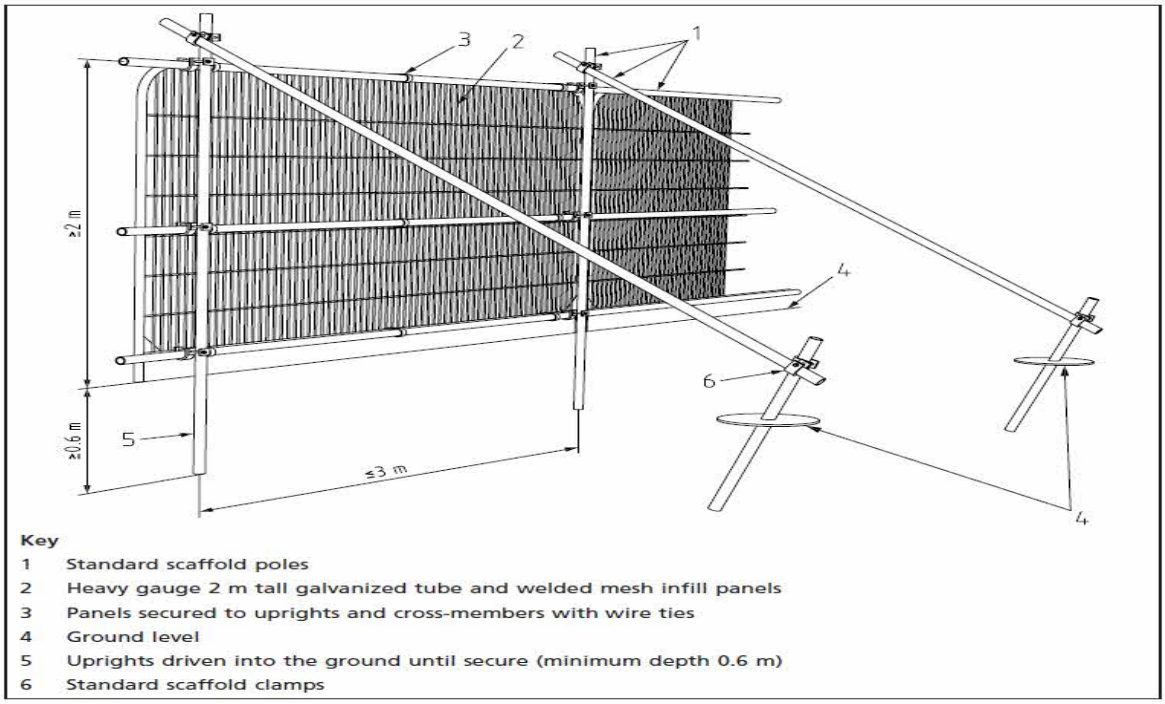

Figure 3 Barrier protection

6.2.3 Ground Protection during demolition

6.2.3.1 Where construction working space or temporary construction access is justified within the RPA, this should be facilitated by a set-back in the alignment of the tree

protection barrier. In such areas, suitable existing hard surfacing that is not proposed for re-use as part of the finished design should be retained to act as temporary ground protection during construction, rather than being removed during demolition. The suitability of such surfacing for this purpose should be evaluated by the project arboriculturist and an engineer as appropriate.

6.2.3.2 Where the set-back of the tree protection barrier would expose unmade ground to construction damage, new temporary ground protection should be installed as part of the implementation of physical tree protection measures prior to work starting on site.

6.2.3.3 New temporary ground protection should be capable of supporting any traffic entering or using the site without being distorted or causing compaction of underlying soil.

NOTE The ground protection might comprise one of the following:

a) for pedestrian movements only, a single thickness of scaffold boards placed either on top of a driven scaffold frame, so as to form a suspended walkway, or on top of a compression-resistant layer (e.g. 100 mm depth of woodchip), laid onto a geotextile membrane;

b) for pedestrian-operated plant up to a gross weight of 2 t, proprietary, inter-linked ground protection boards placed on top of a compression-resistant layer (e.g. 150 mm depth of woodchip), laid onto a geotextile membrane;

c) for wheeled or tracked construction traffic exceeding 2 t gross weight, an alternative system (e.g. proprietary systems or pre-cast reinforced concrete slabs) to an engineering specification designed in conjunction with arboricultural advice, to accommodate the likely loading to which it will be subjected.

6.2.3.4 The locations of and design for temporary ground protection are shown on the tree protection plan 145(S)100_03 and detailed within this arboricultural method statement

6.2.3.5 In all cases, the objective should be to avoid compaction of the soil, which can arise from the single passage of a heavy vehicle, especially in wet conditions, so that tree root functions remain unimpaired.

6.2.4 Additional precautions outside the exclusion zone

6.2.4.1 Planning of site operations should take sufficient account of wide loads, tall loads and plant with booms, jibs and counterweights (including drilling rigs), in order that they can operate without coming into contact with retained trees. Such contact can result in serious damage to the trees and might make their safe retention impossible. Consequently, any transit or traverse of plant in proximity to trees should be conducted under the supervision of a banksman, to ensure that adequate clearance from trees is maintained at all times. Access facilitation pruning should be undertaken where necessary to maintain a clearance.

6.2.4.2 Fires on sites shall be prohibited..

6.2.4.3 Any materials whose accidental spillage would cause damage to a tree should be stored and handled well away from the outer edge of its RPA.

7. Demolition & construction

7.1 General

7.1.1 Construction within the RPA should accord to the principle that the tree and soil structure take priority, and the most reliable way to ensure this is to preserve the RPA completely undisturbed. Soil structure should be preserved at a suitable bulk density for root growth and function (of particular importance for soils of a high fines content).

7.1.2 The ability of a tree to tolerate some disturbance and alteration of its growing conditions depends on specific circumstances, including prevailing site conditions, and in general, the older the tree, the less successfully it will adapt to new conditions.

7.1.3 Excavation within the PRA exculsion zone is kept to two areas only. Works are described in drawing 145(S)100_03A & 145(S)100_04A. Where utility operations do not require planning permission, including those performed by statutory undertakers, they should still be undertaken in accordance with these principles[19].

7.2 Avoiding physical damage to roots…

There is no requirement to access the exlusion zone protecting the boundary tree areas or ancient woodland areas (Appendix F).

7.3 Tree protection during demolition

Tree protection is essentially maintaining the agreeded and specified exclsuion zone areas and to ensure these areas are protected from spills from noxious substances and breaching of the barriers. Ancient woodland Assessment (Appendix F).

7.4 Permanent hard surfacing within RPA

There are no hard surfaces to be constructed within the RPAs.

7.5 Special engineering for foundations within RPA

No requirement.

7.6 Subterranean construction within RPA

No requirement.

[19] As a minimum standard, such operations should be undertaken in accordance with NJUG Volume 4, issue 2[19].

7.7 Underground and above ground utility appatatus

No requirement.

8. Site works. Landscape operations & management

8.1 General

The general treatment of areas around newly planted and existing trees should allow for adequate infiltration of water and free gas exchange, reduction of water evaporation and the retention of an open soil structure to encourage root growth. Care should be taken to ensure that grass or weed growth does not compete with young root growth by intercepting available water supply. The final landscape proposal shall mitigate the disturbance of RPA trees roots in areas that become garden or planted areas following construction and prior to landscape operations commencing.

8.2 Drainage

New development can have an effect on the existing drainage pattern and ground water levels of a site, due to level changes, increased areas of hard surface and new drainage installations. The root systems of mature trees do not generally adapt as well as younger specimens to alterations to groundwater. In most cases the remaining trees will be unaffected. The site is on a slope taking all ground and surface water to the burn and Mouse water, following stage treatment. There are no anticipated alterations to available water across the development.

8.3 Top soil & amelioration

8.3.1 The quality of topsoil is a critical factor for the establishment and growth of new planting or seeding, and should be assessed by a competent person for depth, structure, texture and content. Site won top soil shall be utilised.

8.3.2 Topsoil depths should be appropriate for, and may vary according to, the type and size of planting or seeding to be undertaken. Site won top soil shall be utilised.

8.4 Soil compaction & remediation measures

Soil compaction should be avoided around existing vegetation, including trees, and in areas where new planting or seeding is proposed. Proposed areas for seeding and planting shall be demarcated where practicable, or deep ripped and ameliorated prior to soiling and planting.

8.5 Use of mulch

8.5.1 Open soil and shrub planting areas around newly planted trees should be mulched to inhibit weed growth, reduce groundwater evaporation, resist and mitigate soil compaction and reduce maintenance requirements, whilst allowing gas exchange and water penetration to roots. No requirement.

8.5.2 The materials that may be used for mulching include coarsely divided plant matter, such as well-composted wood chip, pulverized bark, leaf mould or green waste conforming to PAS 100, and these may be combined with well-rotted animal manure. TBA

8.6 Hardsurfaces

8.6.1 Where surfaces adjacent to new tree planting locations are paved, the settlement of the soil in tree pits which occurs gradually after planting can cause movement of the paved area, including the partial collapse or instability of paving or disruption of flexible surfaces, where these are laid over prepared pits. No requirement

8.7 Use of herbicides

The use of herbicides in the vicinity of existing trees should be appropriate for the type of vegetation to be killed, and all instructions, warnings and other relevant information from manufacturers should be strictly observed and followed. TBA

8.8 Tree management

8.8.1 Pre-development tree work

NOTE Consideration could be given to the reuse of wood from felled trees. Guidance on the disposal, utilization and retention of arisings is given in BS 3998:2010[20].

8.8.1.1 Once a layout for the development area has been finalized, an arboriculturist should review the relationship of the development to the trees, and should prepare a schedule of tree works listing all the trees that require work, accompanied by a plan showing where each tree is located (Appendix D 145(S)100_02A).

8.8.1.2 The schedule of works should include:

a) trees for removal to enable development;

b) remedial tree works, including those required to establish acceptable levels

of risk and management in the context of the proposed land use;

c) access facilitation pruning;

d) pre-emptive root pruning.

8.8.1.3 The schedule of works should be accompanied by a detailed specification prepared in accordance with BS 3998:2010.

[20] BS 3998:2010 Tree work. Recommendations. BSI London

8.8.2 Working within the root protection area (RPA)

8.8.2.1 Care should be taken to ensure during tree removal or remedial work that damage to the retained trees and/or disturbance to the RPA is avoided. Precautions should include dismantling techniques to reduce the risk of accidental damage, and ground protection measures where excessive pedestrian movements or use of plant and machinery might lead to compaction.

8.8.2.2 If temporary access is required for plant or vehicles within the RPA, this should be provided by means of temporary ground protection (see 6.2).

8.8.2.3 To avoid adverse impact on retained trees, stumps to be removed within RPAs should not be dug or pulled out but should be ground out.

8.8.3 Post-development management: existing trees

A programme of inspections to advise on any necessary work to retained trees should be drawn up in conjunction with an arboriculturist. This programme might include recommendations for frequency of inspection and/or proposals for tree work, and should take the form of a management plan. A copy of this plan should be supplied to all parties with an interest in future site management. The Tree survey schedule recommends an inspection programme (Appendix A).

9. Recommendations

The Tree schedule sets out the framework for remedial tree works and for removal (Appendix B). A Felling Licence may be required as the Forestry Commission's parameters of $5m^3$ of timber per quarter shall be exceeded, however, exemptions may apply as part of the overall Planning permission for the works. There will be seasonal restrictions on on all tree works to comply with the Wildlife & Countryside Act 1981 to protect nesting birds between 1 March and 31 July. Conservation consent will be required to carry out all tree works.

Following the issue of the Plant Health Notice 2012 No 2707, there are no existing restrictions on the transportation of Ash (***Fraxinus spp***) timber following the outbreaks of Ash Dieback (***Chalara fraxinae)*** within the region, however, reporting to the Forestry Commission of infection is prudent to assist in the monitoring of the disease.

The remaining arboricultural works include crown reduction and crown thinning, and have been specified to accommodate the proposed development in the main, and others recommended as good arboricultural practice. This will ensure the trees remaining will be in relatively good health and in a safe condition. These trees will continue to grow in an optimal fashion in keeping with each species' expected growth patterns. The works identified are listed by abbreviation. The key for these works is at the top of each schedule. The works in the main are advisory and recommended, unless deemed a hazard.

Protection of the trees during construction at various locations will be required before prior to construction works and following all recommended tree works, essentially at all boundary edges for the protection of trees outwith the development site. Drawing 145 (L) 100_03A & 145(S)100_04A (Appendix E) shows mitigation requirements during construction.

The RPA (Root Protection Areas) shall be implemented as per BS5837:2012, 6.2 Barriers & Ground protection to ensure trees within the construction site are protected.

The survey work recommendations are identified within the tree survey schedule and specify the removal of 27 trees.

The Landscape development proposals (still to be finalised) and the Arboricultural Method Statement shall ensure that any fears about the integrity of the surrounding protected areas are preserved and where possible shall be enhanced. Beyond the tree removal that faciliate the development, other trees require further consideration in interests of ensuring the more dominant species continue to thrive.

TLC Environmental Limited

[redacted]

Keith Vernon *MLA DMS DHE Cert Arb(RFS) ISAMembProf FCIHort F Arbor A CHort CEnv CMLI*

10. Author qualifications

Membership of Professional Organisations & Office positions

Organisation	Membership grade	Post nominal	Membership no
Landscape Institute	Chartered Landscape Architect	CMLI	15787
Landscape Institute	TLC Environmental Limited Registered Practice		21044
Arboricultural Association	Fellow	F Arbor A	FC03944
Chartered Institute of Horticulture	Chartered Fellow Horticulturist	CHort FCIHort	00007669
Chartered Institute of Horticulture	Management Board Honorary Secretary	-	-
Chartered Institute of Horticulture	Education & Qualifications Committee	-	-
Society for the Environment - SocEnv	Chartered Environmentalist	CEnv	6253
Arboricultural Association	Scottish Branch – Committee Member	-	-
International Society of Arboriculture	Professional	ISA Memb Prof	CSID 277105
Expert witness.co.uk	Member	-	15076

Membership of other Organisations

Organisation	Membership grade	Post nominal	Membership no
CITB	Site Safety SMSTS	-	3404674
CITB	CSCS Professional Member Landscape Architect		3404674
Royal Horticultural Society	Member	-	26813286
Royal Caledonian Horticultural Society	Member	-	2436104
Scottish Garden History Society	Member	-	-
The Tree Register (TROBI)	Member	-	-

Professional Qualifications & Associated Qualifications

Award	University/ College	Post nominal	Exam & grade
Master of Landscape Architecture	Herriot Watt/ Edinburgh College of Art (ECA)	MLA	Written/ Project - Credit
Chartered Landscape Architect	Landscape Institute	CMLI	Diary/Oral exam - Pass
Diploma in Horticulture	Royal Botanic Garden Edinburgh	DHE	Written/ Practical/ Oral - Credit
Chartered Horticulturist	Chartered Institute of Horticulture	CHort	Written - pass
Certificate in Arboriculture	Royal Forestry Society	Cert Arb (RFS)	Written/ Practical - Credit
NPTC Arboricultural Operations Certificate	National Proficiency Tests Council		Pass
Chartered Environmentalist	SocEnv	CEnv	Oral exam/ report - pass
Professional Tree Inspection	Arboricultural Association		Pass
Diploma in Management Studies	Abertay University Dundee	DMS	Written/ project - Credit
City & Guilds Ornamental & Amenity Horticulture Stage 1 - 2	Elmwood College Cupar	-	Credit
City & Guilds Ornamental & Amenity Horticulture Stage 3 Management	Elmwood College Cupar	-	Credit
ISO14001:2004 Internal Auditor	QCS Cumbernauld	-	Pass
ISO9001:2015 Internal Auditor	QCS Cumbernauld	-	Pass
OHSAS:2007 Internal Auditor	QCS Cumbernauld	-	Pass
Managing Safety Certificate	IOSH	-	Pass
Certificate in Risk Assessment	ASET	-	Pass
Level 1 & 2 Safety Representative Certificate	NOCN	-	Pass
Strategic Leadership in Local Government Certificate	Caledonian University	-	Pass

11. Terminology

The following terms have been used in this report. To ensure that the report has been fully understood, each term has a specific arboricultural definition to explain either a tree defect or an arboricultural (tree surgery) activity.

Tree tag:	Tree identification number.
Tree code:	Shorthand code using first two letters of the Genus and first three letters of the species.
Genus/ species:	Refers to the tree name by Genus, species & variety.
Height:	Height in metres.
DBH:	Diameter at 1.5m from ground level.
Crown dia:	Measurement from stem to drip line (extent of crown).
Root plate zone:	The immediate ground condition under the tree canopy (the root plate zone may extend beyond the canopy line) Often this area may reveal the root cause of the symptoms the tree is exhibiting.
Age Classification:	To enable the recipient of the report to conceptualise the trees being surveyed, it is useful to give an estimation of tree age. This allows a 'pictorial' image to create a context within the survey.
YT:	Young tree – trees that are small in comparison to its mature counterpart, and are approximately up to 1/3 of its total life expectancy.
SM:	Semi mature – trees in this classification are of sufficient size to resemble the main mature version but are still transplantable.
EM:	Early mature – a tree halfway through its natural life expectancy.

M:	Mature – this stage represents a least the halfway point in the total life expectancy of the trees life, where no height increase is expected, but some incremental stem thickening may be.
FM:	Fully mature – this is a confusing stage as many of our parkland trees have been introduced over the last 250 years and many have not reached their potential growth.
OM:	Over mature – trees in decline showing limited growth and large amounts of dieback.
LAI:	Leaf Area Index

Action/ Arboricultural works

Deadwood (DW):	The activity to remove dead, dying and diseased branches within the tree crown.
Crown lift (CL):	The removal of lower limbs and branches of the crown structure to create more height under the tree.
Crown reduce (CR):	Reduction of the entire crown to reduce the trees overall size.
Crown thin (CT):	To thin out the crown structure to allow in more air and light and reduce wind resistance.
Structural repairs (SR):	The activity to collectively gather activities to remove and repair damaged and dangerous limbs, including hung up limbs.
Remove Ivy (RI):	Heavy Ivy growth will increase the wind resistance of the tree, leaving the tree vulnerable during high winds. The ivy will also conceal structural defects.
Pollard (P):	Removal of the upper section of the tree to a specified height. One third is recommended for this report.

Fell (F):	The activity of removing a tree either through clear felling on the ground or through sectional felling.

Tree Hazards & Defects

Hung up:	Refers to a part of the tree that has failed and is caught up within the crown structure.
Included bark:	(Ingrown bark) bark of adjacent parts of a tree (usually in forks) which is face to face contact, so that there is a weakness due to lack of a woody union.
Hazard beam:	
Cavity:	Refers to an area where once sound structural timber once existed, now either a hollow or rotting mass prevails. The presence of a cavity does not necessary indicate a structural limitation.
Fungal infection:	Refers to the presence of fungal fruiting bodies known to be associated with structural defects.

Appendix A

145 Tree survey schedule

TLC ENVIRONMENTAL LIMITED
9A STRATHAVEN ROAD
LESMAHAGOW, ML11 ODN

TREE SURVEY & HAZARD ASSESSMENT

SITE SURVEY RECORD SHEET

PROJECT	BS 5837:2012 TREE SURVEY
LOCATION	BELLEFIELD ROAD
ADDRESS	LANARK
CLIENT	MARCHSTONE BELLEFIELD LIMITED
JOB NO	145
DRAWING	145(S)100_01A - 04A

TREE DESCRIPTION, DIMENSIONS & ACTION

Legend: Age Class: YT=Young Tree; SM=Semi Mature; M=Mature; FM- Fully Mature; OM=Over mature; BS5837 Category: A=High Value; B=Moderate value; C=Low Value; U=Unsuitable/ No Value; NOD=no obvious defects; NMD=No Major Defects: **Works**: NWR=No work required; DW=Dead wood; CC=Crown Clean; CL=Crown Lift; CR=Crown Reduce; CT=Crown Thin; SR=Structural Repairs; SD=Storm damage; HB=Hazard Beam; R=Remove Tree; ST=Standing timber to ?m; P=pollard; RE=Remove epicormic growth; RI remove ivy; RH=Remover hangers; FIR=Further Inspection Required; Mo=Monitor as indicated; BIR=Bat inspection required; RP=Root protect; IC=Inspect cavity; L2C3=Likelihood & Consequence of failure: Life expectancy based following works carried out; ± = estimated value.

Tree tag number	Genus/ Species	Common name	Root plate zone condition/ comments	Tree description/ comments	Vigour/ Health	Structural issues	NESW Crown radi ±				D@1.5 m(mm)	Height (m)	Age Class	Age ±	BS5837 Cat	Life expectancy (yrs)	Hazard Likelihood	Risk Consequence	HRV	Recommended works - BS3998:2010	RPA (m)	Inspect Frequency (month)
1701	Fraxinus excelsior	Ash	overgrown holly scrub	Poor shape bent stem sounded cavity; sparse crown large limb arching to SE	good	possible cavity	8	10	10	5	750	20	M	94	C	10	3	3	9	NW; MO	9.0	18
1702	Acer platanoides	Norway Maple	scrub holly	Large bent stem arching north sparse crown one sided to north suppressed	average	poor stem	6	6	7	4	650	20	M	82	C	10	3	3	9	CR5m	7.8	18
1703	Fraxinus excelsior	Ash	wild garlic	Leaning to north possible made up ground to south sparse biforkate crown clear straight stem	good	stem bulge to west	10	5	11	4	660	20	EM	83	C	10	3	3	9	CR5m	7.9	18
1704	Pinus sylvestris	Scots Pine	wild garlic	Tall straight stem pine dead wood up stem average condition limbs to south	good	NOD	3	2	6	4	700	20	M	88	B	20	2	4	8	NW	8.4	18
1705	Acer pseudoplatanus	Sycamore	wild garlic	Good condition multi stem tree from 5m off shoot sucker limb to south broad spreading crown on NS axis	good	NOD	12	5	10	7	730	20	M	92	B	20	2	3	6	NW	8.8	18
1706	Fraxinus excelsior	Ash	undergrowth	Poor leaning tree to east dense ivy stem bends compensatory buttresses to west	poor	lean	6	8	0	0	450	17	M	57	U	0	4	4	16	R		
1707	Fraxinus excelsior	Ash	banking field edge	Large Ash leaning west advances ivy growing with dense leaves and stems average condition	good based on stem	significant lean to west	6	4	6	10	800	22	M	100	C	10	3	2	6	RI	9.6	18
1708	Picea abies	Norwary Fir	banking	large fir straight stem dense ivy throughout dense crown	good	NOD	6	5	5	6	575	22	M	72	B	20	2	3	6	NW	6.9	18
1709	Fraxinus excelsior	Ash	scrub	Poor developed tree leaning north large low limb to north dense ivy and stems	average	Ivy	13	5	0	1	750	20	M	94	C	10	3	3	9	RI	9.0	18
1710	Pinus sylvestris	Scots Pine	top of gorge	Large pine exposed root butresses poss on rock outcrop dense mature ivy and heavy stems	good	NOD	4	5	3	2	850	20	M	107	B	20	2	3	6	RI	10.2	18
1711	Acer pseudoplatanus	Sycamore	scrub	Poor tree bent stem in decline dead wood suppressed by large larch sparse crown	poor	leans and bends	6	5	3	4	550	14	EM	69	C	10	2	3	6	NW	6.6	18
1712	Acer pseudoplatanus	Sycamore	path	Poor condition multiple stem lesions burrs and included stem union fused upper limb sparse crown	poor	union	6	5	6	1	620	19	EM	78	C	10	2	3	6	NW	7.4	18
1713	Acer pseudoplatanus	Sycamore	path	Leaning east dense ivy throughout average condition broad spreading crown	average	Ivy	5	13	6	5	750	21	M	94	C	10	3	3	9	CR5m on East	9.0	18
1714	Pinus sylvestris	Scots Pine	brash	Has a large pine collapsed against it pushing over may recovery dense ivy open crown	average	NOD	1	7	2	0	650	22	M	82	C	10	3	3	9	SR Hung up tree	7.8	18
1717	Acer pseudoplatanus	Sycamore	Wall	Suppressed by larch growing on demolished wall projected buttresses poor crown stem bends	average	NOD	7	7	3	3	500	16	EM	63	C	10	2	1	2	CR2m	6.0	18
1716	Larix decidua	Larch	brash	Heavy lean to east pedestal base poor dense top heavy crown epinasty bends in limbs storm damage stubs	average	lean	7	8	6	4	900	20	M	113	C	10	2	1	2	SR SD; CR5m on Development side	10.8	18
1718	Larix decidua	Larch	brash storm damage	Average con large larch poor shaped crown and lower limb epanasty limbs leaning east extensive storm damaged hangers and dense upper crown	good	Storm damage	8	10	4	6	900	20	M	113	C	10	3	2	6	SR SD; CR5m on Development side	10.8	18
1719	Acer pseudoplatanus	Sycamore	brash	Average condition self sown scrub tree	poor	NOD	5	5	2	3	350	13	EM	44	C	10	2	2	4	NW	4.2	18
1720	Acer pseudoplatanus	Sycamore	brash	Average condition suppressed one sided crown poor tree	Average	NOD	5	5	2	2	350	16	EM	44	C	10	2	2	4	NW	4.2	18
1723	Larix decidua	Larch	brash	Poor shaped tree stem bluge at base poor upper crown one sided suppressed	good	stem bulge	7	4	2	4	900	20	OM	113	C	10	3	3	9	CT20%	10.8	18

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1725	Picea abies	Norway Fir	bank near burn	Average condition clear straight stem dense upper crown heavy buttress banking	good	NOD	4	3	3	3	670	20	M	84	B	20	3	3	9	NW	8.0	18
1728	Picea abies	Norway fFir	field	Average condition dense onesided crown	ave	NOD	4	3	3	3	500	22	M	63	C	10	2	4	8	NW	6.0	18
1732	Picea abies	Norway Fir	field	Stem bulges cracks oval stem projected roots dense crown even some heave	good	NOD	4	4	4	5	630	22	M	79	C	10	2	4	8	NW	7.6	18
1753	Pinus sylvestris	Scots Pine	burn bank	Average condition tall pine one sided crown	good	NOD	4	1	1	5	660	20	M	83	C	10	2	2	4	NW	7.9	18
1754	Pinus sylvestris	Scots Pine	burn bank	Average condition straight poorly developed crown	good	NOD	4	4	0	2	360	20	M	45	C	10	3	3	9	NW	4.3	18
1755	Pinus sylvestris	Scots Pine	burn bank	Average condition poorly developed crown sparse broad	good	NOD	6	3	1	6	410	20	M	51	C	10	2	2	4	NW	4.9	18
1756	Pinus sylvestris	Scots Pine	woodand	Average condition straight stem till twist dw open crown	good	NOD	4	3	3	4	610	20	M	77	B	20	3	2	6	NW	7.3	18
1757	Pinus sylvestris	Scots Pine	burn bank	Large pine leaning north broad crown large limb to west	good	lean	7	4	3	6	530	20	M	67	B	20	3	3	9	NW	6.4	18
1758	Picea abies	Norway Fir	wet ground	Average condition remove for suds	average	NOD	6	3	1	6	660	21	M	83	C	10	2	2	4	R		
1767	Acer pseudoplatanus	Sycamore	Roadside verge	Average condition some dw lean toward road butresses lifted on west ballacing back to west	poor ave	lean	6	6	4	5	470	16	EM	59	C	10	3	4	12	R		
1768	Fraxinus excelsior	Ash	Roadside verge	Veteran ash dense ivy multiple storm damage broad canopy stem bulge reinspect	slowing down	Storm damage	9	7	9	9	1270	19	V	160	A	40	3	4	12	RI; reinspect	15.2	18
1769	Fraxinus excelsior	Ash	Roadside verge	Dense ivy and deadwood throughout; dense growth made the tree difficult to survey	slow	ivy	5	6	6	5	950	17	OM	119	B	20	3	4	12	RI; Reinspect	11.4	18
NT	Betula pendula	Birch	woodland	failed tree remove	poor	poor condition	0	0	0	0	0	nr	EM	0	U	0	2	3	6	R		
NT	Pinus sylvestris	Scots Pine	woodland	bottle butt pine remove	poor	poor condition	0	0	0	0	0	nr	EM	0	U	0	3	3	9	R		
1715	Larix decidua	Larch	field	Poor tree significant lean to east	poor	poor condition	0	0	0	0	0	nr	EM	0	U	0	3	4	12	R		
1721	Acer pseudoplatanus	Sycamore	field	Poor tree	poor	poor condition	0	0	0	0	0	nr	EM	0	U	0	3	3	9	R		
1722	Acer pseudoplatanus	Sycamore	field	Poor tree	poor	poor condition	0	0	0	0	0	nr	EM	0	U	0	3	3	9	R		
1724	Acer pseudoplatanus	Sycamore	field	Poor tree	poor	poor condition	7	2	2	4	0	nr	EM	0	U	0	3	3	9	R		
1729	Acer pseudoplatanus	Sycamore	field	Poor tree	poor	poor condition	2	2	2	2	0	nr	EM	0	U	0	3	3	9	R		
1730	Acer pseudoplatanus	Sycamore	field	Poor tree	poor	poor condition	10	3	0	0	0	nr	EM	0	U	0	3	3	9	R		
1731	Acer pseudoplatanus	Sycamore	field	Poor tree	poor	poor condition	13	1	0	0	0	nr	EM	0	U	0	3	3	9	R		
1794	Populus tremula	Aspen	field	Average selfsown poor roots	poor	poor condition	0	0	0	0	250	13	YT	31	C	0	2	2	4	R		
1793	Populus tremula	Aspen	field	Average selfsown poor roots	poor	poor condition	0	0	0	0	270	13	YT	34	C	0	2	2	4	R		
1777	Populus tremula	Aspen	field	Average selfsown poor roots	poor	poor condition	0	0	0	0	210	13	YT	26	C	0	2	2	4	R		
1795	Populus tremula	Aspen	field	Average selfsown poor roots	poor	poor condition	0	0	0	0	200	13	YT	25	C	0	2	2	4	R		
1786	Populus tremula	Aspen	field	Average selfsown poor roots	poor	poor condition	0	0	0	0	200	13	YT	25	C	0	3	2	6	R		
1791	Populus tremula	Aspen	field	Average selfsown poor roots	poor	poor condition	0	0	0	0	340	13	YT	43	C	0	2	2	4	R		
1781	Populus tremula	Aspen	field	Average selfsown poor roots	poor	poor condition	0	0	0	0	340	13	YT	43	C	0	2	2	4	R		
1797	Populus tremula	Aspen	field	Average selfsown poor roots	poor	poor condition	0	0	0	0	350	13	YT	44	C	0	2	2	4	R		
1788	Populus tremula	Aspen	field	Average selfsown poor roots	poor	poor condition	0	0	0	0	350	13	YT	44	C	0	2	2	4	R		
1760	Sorbus aucuparia	Rowan	Wall	Collapsed	poor	poor condition	0	0	0	0	nr	nr	YT	nr	U	0	3	2	6	R		
NT	Betula pendula	Birch	wall	Poor tree	poor	poor condition	0	0	0	0	nr	nr	YT	nr	U	0	2	3	6	R		
1697	Acer pseudoplatanus	Sycamore	Wall	Poor tree	poor	poor condition	0	0	0	0	nr	nr	EM	nr	U	0	3	3	9	R		
NT	Picea abies	Norway Fir	marsh	Remove for suds	poor	poor condition	0	0	0	0	250	nr	EM	31	C	0	2	3	6	R		
NT	Picea abies	Norway Fir	marsh	Remove for suds	poor	poor condition	0	0	0	0	350	nr	EM	44	C	0	2	3	6	R		
NT	Picea abies	Norway Fir	marsh	Remove for suds	poor	poor condition	0	0	0	0	650	nr	EM	82	C	0	2	3	6	R		

Appendix B

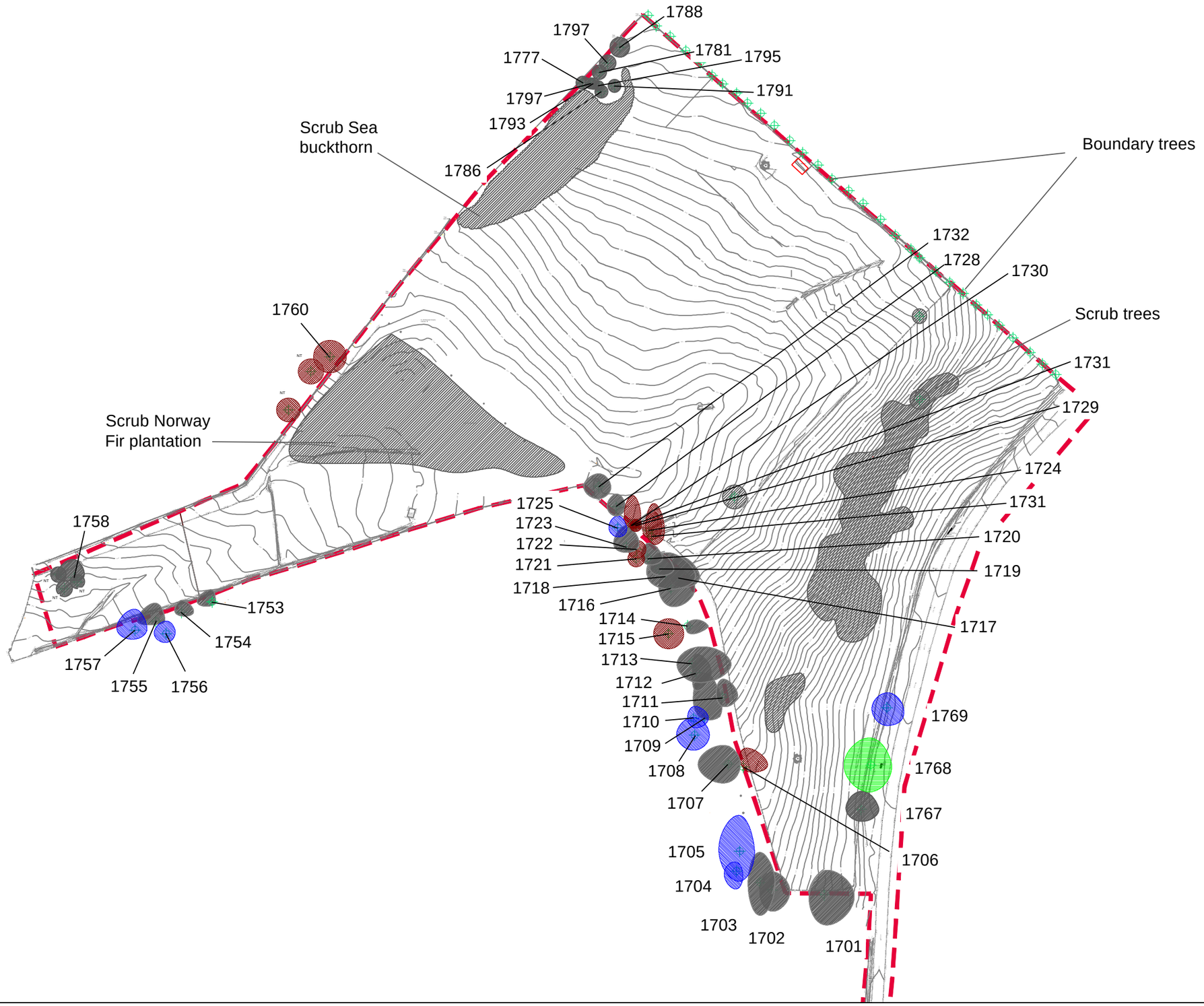
BS5837:2012 - Tree categories

BS5837:2012 Table 1 – Cascade Chart for Tree Quality Assessment

Category and definition	Criteria (including subcategories where appropriate)			Identification on plan
Trees unsuitable for retention (see Note)				
Category U Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years	ƒ 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 category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning) ƒ Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline ƒ Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality *Note: Category U trees can have existing or potential conservation value which it might be desirable to preserve; see BS5837:2012 paragraph 4.5.7.*			Red
	1 **Mainly arboricultural qualities**	**2** **Mainly landscape qualities**	**3** **Mainly cultural values, including conservation**	
Trees to be considered for retention				
Category A **Trees of high quality** with an estimated remaining life expectancy of at least 40 years	Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)	Green
Category B **Trees of moderate quality** with an estimated remaining life expectancy of at least 20 years	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation	Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality	Trees with material conservation or other cultural value	Blue
Category C **Trees of low quality** with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits	Trees with no material conservation or other cultural value	Grey

Appendix C

Tree Survey 145 (S) 100_01A



BS5837: 2012: Trees in Relation to design, demolition and construction - Recommendations. Tree Categories

Category U: Trees unsuitable for retention - Cannot be realistically be retained as living trees in the context of current land use for longer than 10 years ; Trees to be removed as part of wider woodland management for the site.

Category A: Trees of high quality with an estimated remaining life of a least 40 years: s categories 1, 2 & 3*

Category B: Trees of moderate quality an estimated remaining life expectanc least 20 years: sub categories 1, 2 ,

Category C: Trees of low quality with an estimated remaining life of at least 10 years,or young trees stem below 150mm: sub categories 1,2 & 3*

*Sub category 1: Mainly arboricultural value:
*Sub category 2: Mainly landscape value:
*Sub category 3: Mainly cultural values, including conservation

Site Boundary

Revision:	Date:	Details:	Drawn:	Checked:
A	15.05.19	Revised layout	KV	JG

Drawing revisions:

Drawing status:
PLANNING

Client:
MARCHSTONE BELLEFIELD LIMITED

Project Info:
BS5837:2012 TREE SURVEY FOR
THE PROPOSED HOUSING DEVELOPMENT AT
BELLEFILED ROAD LANARK

Drawing Info:
TREE SURVEY

Scale:	Drawn by:	Date:	Checked by:
1:650@A1	KV	21.05.19	JG

Drawing No: Revision:
145 (S) 100_01 A

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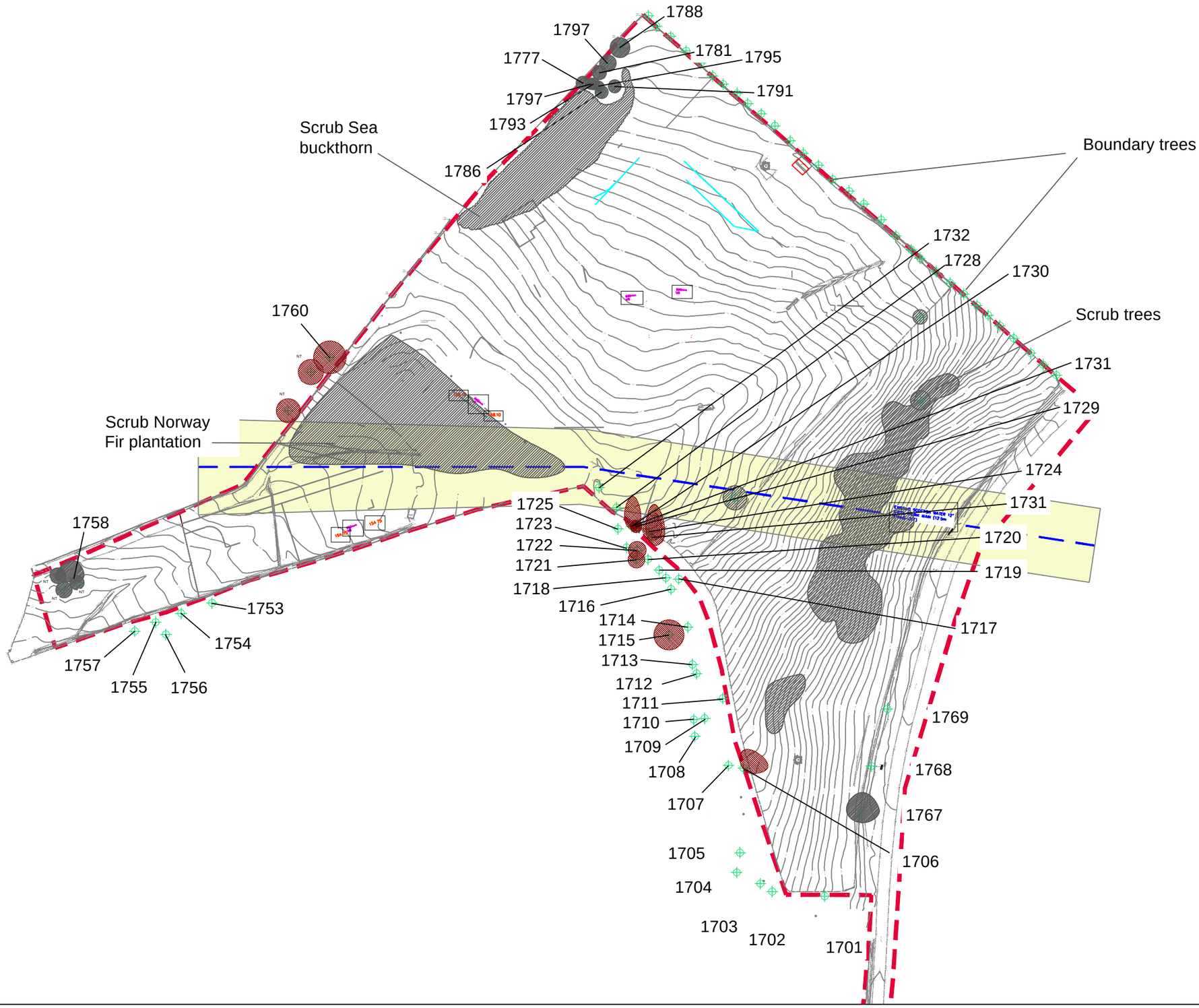
Appendix D

Tree removal drawing – 145 (S) 100_02A



BS5837: 2012: Trees in Relation to design, demolition and construction - Recommendations. Tree Categories

Category U: Trees unsuitable for retention - Cannot be realistically be retained as living trees in the context of current land use for longer than 10 years ; Trees to be removed as part of wider woodland management for the site.

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*Sub category 1: Mainly arboricultural value:
*Sub category 2: Mainly landscape value:
*Sub category 3: Mainly cultural values, including conservation

Site Boundary

Revision:	Date:	Details:	Drawn:	Checked:
A	15.05.19	Revised layout	KV	JG

Drawing revisions:

Drawing status:
PLANNING

Client:
MARCHSTONE BELLEFIELD LIMITED

Project Info:
BS5837:2012 TREE SURVEY FOR
THE PROPOSED HOUSING DEVELOPMENT AT
BELLEFILED ROAD LANARK

Drawing Info:
TREE REMOVAL

Scale:	Drawn by:	Date:	Checked by:
1:650@A1	KV	21.05.19	JG

Drawing No: 145 (S) 100_02 Revision: A

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Appendix E

Tree protection drawing– 145 (S) 100_03A – 04A

Tree Survey and Inspection

The tree survey and inspecion was carried in in accordance with The Arboricultural Associations Recomendations for Tree Survey 1994, where onsite visual observations regarding tree condition were made in conjunction with The DTLR Principles of Tree Hazard Assessment & Management 1999. All observations and assessments were made from ground level.

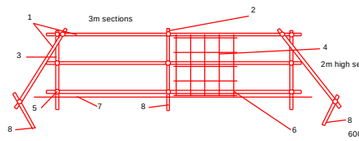
Root Protection Area (RPA)

All protection area are designed in conjuction with the recommendations made in BS 5837: 2005 as per section 5.0 'Tree Constraints and Design', and all proposals for proection made in conjunction with 6.0 'The Exculsion Zone: Barriers and Ground Protection'.

Barriers and ground protect shall be installed prior to onsite works and prior to the delivery of equipment and materials.

Barriers shall consist of a scaffolf framework as per attached detail, comprising of a vertical and horizontal framework, well braced to resist impacts, with vertical tubes spaced at a maximum interval of 3m. Onto the framework, weld mesh panels or 2m high shuttering board be fixed using scaffold clamps - Heras fencing will not be used as a substitute to the above.

The construction exclusion line is marked in a red dashed line beyond each identified RPA.



Detail for Protection

1. Scaffold poles.
2. Uprights driven into the ground.
3. Panels secured to uprights.
4. Weld mesh wired to uprights & horizontals.
5. Clamp.
6. Wire twisted to secure.
7. Ground level.
8. Approx 300 x 300 x 600mm concrete foundations .

A variation on the above theme is acceptable using heras fencing provided it is fixed to concrete set scaffold poles

BS5837: 2012: Trees in Relation to design, demolition and construction - Recommendations. Tree Categories

Category U: Trees unsuitable for retention - Cannot be realistically be retained as living trees in the context of current land use for longer than 10 years ; Trees to be removed as part of wider woodland management for the site.

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Category C: Trees of low quality with an estimated remaining life of at least 10 years,or young treer stem below 150mm: sub categories 1,2 & 3*

* Sub category 1: Mainly arboricultural value:
*Sub category 2: Mainly landscape value:
* Sub category 3: Mainly cultural values, including conservation

Site Boundary

RPA Exclusion Zone: As per indicated fence structure BS5837:2012 6.2.

Root Protection Areas

Revision:	Date:	Details:	Drawn:	Checked:
A	15.05.19	Revised layout	KV	JG

Drawing revisions:

Drawing status:
PLANNING

Client:
MARCHSTONE BELLEFIELD LIMITED

Project Info:
BS5837:2012 TREE SURVEY FOR
THE PROPOSED HOUSING DEVELOPMENT AT
BELLEFILED ROAD LANARK

Drawing Info:
TREE PROTECTION
GROUND WORKS

Scale:	Drawn by:	Date:	Checked by:
1:650@A1	KV	21.05.19	JG

Drawing No: 145 (S) 100_03 Revision: A

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Tree Survey and Inspection

The tree survey and inspecion was carried in in accordance with The Arboricultural Associations Recomendations for Tree Survey 1994, where onsite visual observations regarding tree condition were made in conjunction with The DTLR Principles of Tree Hazard Assessment & Management 1999. All observations and assessments were made from ground level.

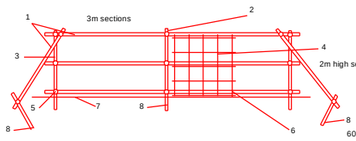
Root Protection Area (RPA)

All protection area are designed in conjuction with the recommendations made in BS 5837: 2005 as per section 5.0 'Tree Constraints and Design', and all proposals for proection made in conjunction with 6.0 'The Exculsion Zone: Barriers and Ground Protection'.

Barriers and ground protect shall be installed prior to onsite works and prior to the delivery of equipment and materials.

Barriers shall consist of a scaffoll framework as per attached detail, comprising of a vertical and horizontal framework, well braced to resist impacts, with vertical tubes spaced at a maximum interval of 3m. Onto the framework, weld mesh panels or 2m high shuttering board be fixed using scaffold clamps - Heras fencing will not be used as a substitute to the above.

The construction exclusion line is marked in a red dashed line beyond each identified RPA.



Detail for Protection

1. Scaffold poles.
2. Uprights driven into the ground.
3. Panels secured to uprights.
4. Weld mesh wired to uprights & horizontals.
5. Clamp.
6. Wire twisted to secure.
7. Ground level.
8. Approx 300 x 300 x 600mm concrete foundations .

A variation on the above theme is acceptable using heras fencing provided it is fixed to concrete set scaffold poles

Hand dig only; any exposed roots covered with moist Hessian sheets and kept moist throughout excavation.

Ensure that the RPAs are avoided during works to implement the banking/ batter.

Hand dig only; any exposed roots covered with moist Hessian sheets and kept moist throughout excavation.

BS5837: 2012: Trees in Relation to design, demolition and construction - Recommendations. Tree Categories

Category U: Trees unsuitable for retention - Cannot be realistically be retained as living trees in the context of current land use for longer than 10 years ; Trees to be removed as part of wider woodland management for the site.

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* Sub category 1: Mainly arboricultural value:
*Sub category 2: Mainly landscape value:
* Sub category 3: Mainly cultural values, including conservation

Site Boundary

RPA Exclusion Zone: As per indicated fence structure BS5837:2012 6.2.

Root Protection Areas

Revision:	Date:	Details:	Drawn:	Checked:
A	15.05.19	Revised layout	KV	JG

Drawing revisions:

Drawing status: PLANNING

Client: MARCHSTONE BELLEFIELD LIMITED

Project Info:
BS5837:2012 TREE SURVEY FOR
THE PROPOSED HOUSING DEVELOPMENT AT
BELLEFILED ROAD LANARK

Drawing Info:
TREE PROTECTION
HOUSING

Scale:	Drawn by:	Date:	Checked by:
1:650@A1	KV	21.05.19	JG

Drawing No: 145 (S) 100_04 Revison: A

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Appendix F

Ancient Woodland Assessment

	Assessment criteria	Response	Mitigation
1	Is the site of the ancient woodland the only possible place for this proposal? Does it have to be on the ancient woodland site (i.e. is it location dependent) or can it go anywhere else?	The proposed site is adjacent the Ancient woodland & PAWS.	A buffer protection zone of 3.5m will be implemented. There are no significant tree RPAs from the area within the buffer zone.
2	What size of ancient woodland will be affected? Ideally this will be recorded in hectares. The importance of diversity of habitat and species in small woods must not be underestimated, and also their function as stepping stones for the dispersal of species. Small ancient woodlands may be the remnants of formerly larger areas, and thus have a higher biodiversity importance than might be assumed. Ecological diversity in woodlands is not solely linked to the size of the woodland.	The buffer zone covers an area of 812m2 and is located on the southern boundary of the area.	The buffer zone will protect any roots that extended beyond the walled boundary.
3	Will an area of woodland be lost? If so what are the likely implications of this? A small loss from a small woodland or veteran tree loss could be more significant in its wider impacts than a large loss from a large woodland. Consider the nature of the woodland that will be affected.	No woodland will be lost other than the dead and collapsed trees on the walled boundary.	All timber will be stacked and stored on site for ecologically purposes.
4	How well connected is the woodland? Is it isolated or connected to other woodland blocks? Will connectivity be damaged? Consider the retention of connecting habitat such as hedgerows and copses and attempt to maintain and enhance long term protection secured through the planning process.	No connection to the development.	The development will install a boundary fence. There will be no disturbance or disrupted connectivity.

5	Will there be damage to the Root Protection Area of the woodland or individual trees? The Root Protection Zone (as specified in British Standard 5837) is there to protect the roots of trees, which often spread out further than their canopy. Protection measures include taking care not to cut tree roots i.e. by trenching or causing soil compaction around trees i.e. through vehicle movements; or contamination from poisons e.g. site stored fuel or chemicals.	No damage to RPA	3.5m Buffer zone installed as per 6.2 BS5837:2012
6	Has a survey for protected species been included in the application? Ancient woodland and veteran trees can be particularly important for certain protected species such as dormice and bats. If protected species are present then additional assessments of noise and light pollution particularly for bats may be necessary. Many species live partly in woodland but also use other adjacent semi-natural habitat for feeding or breeding. Will the development result in the change or reduction of important habitats adjoining the woodland?	See Ecological Report	See Ecological Report.
7	Does the development have the potential to affect the woodland through changes to air quality or to ground water (through pollutants or changes in hydrology)? If so, has an assessment been carried out and appropriate mitigation proposed? Impacts from air and water pollution and hydrological changes have the potential to occur at significant distances from the source.	The development consists of 25 units, there are no concerns regarding pollution and air quality. The site is on a gradual and at time steep inclines, all surface water shall run as before through treatment prior to discharge to the Monk Burn.	A drainage impact assessment has been carried out.

	Consider a Hydrological Impact Assessment to assess any change in hydrology (quality and quantity of water) and any potential effects. This is of particular importance to ancient gill woodlands as they often contain important communities of lower plants (mosses, liverworts, and lichens). Is there a need for a tailored assessment of pollutants on industrial developments?		
8	Will access to the woodland increase? There is the potential for the remaining woodland to be damaged by visitors, new gardens, and domestic pets. Impacts to consider include disturbance to birds, protected species, woodland flora and soil; fly tipping; garden encroachment, and cat predation. Also consider the impact of increased public use near veteran trees.	There will be no additional access to the woodland	The development will install a boundary fence. There will be no disturbance or disrupted connectivity.
9	What is the current function, and planned function, of the land to be lost to development? Consider a full assessment of the land to be lost for its function in enhancing and or supporting the adjacent ancient woodland. For example, is the proposal located in a network of ancient woodland blocks? Could the development have a knock-on effect on a number of areas of ancient woodland? The application site could include areas of scrub and grassland which contribute to supporting species within the ancient woodland and thus contribute to its biodiversity.	No land will be lost to development.	The development will install a boundary fence. There will be no disturbance or disrupted connectivity.
10	Does the landscaping scheme include native species,	Provision will be made to specify a range of species common to the area to	Landscape plan TBA.

	preferably of local provenance? Consider whether the landscaping includes native species preferably of local provenance. Exotic species can escape from gardens into the adjacent woodland and compete with native species. This process will degrade the woodland over time. Is the landscape proposal sympathetic to the surrounding habitats?	preserve landscape character.	
11	Conclusions This section is for summarising the likely impacts on the ancient woodland and the avoidance and mitigation measures proposed (either by the applicant or the LPA). Do you require any additional information from the applicant before you can make an informed judgement? If the final conclusion is, that despite the avoidance and mitigation measures proposed, an area of ancient woodland will still be lost or significantly deteriorated then the test set out in paragraph 175 of the National Planning Policy Framework (2018) should be considered; development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists; The Standing Advice on Ancient Woodland and Veteran trees sets out appropriate mitigation and compensation measures.	There are no negative impacts, as the woodland will remain untouched as before.	No mitigation required.

Appendix G

Landscape proposal – 145 (L) 100_05A

Dimensions and levels to be read from this drawing checked on site; any discrepancies to be reported to the Landscape Architect. Do not scale from this drawing. All work to be executed in accordance with the specification and in conjunction with all cited working practices and legislation relevant to the activity. Where indicated all drawings to be read in conjunction with all documents issued by TLC Environmental Limited .
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Site Boundary

Q31: Tree Planting: 12-14cm Rootballed Trees; double staked

Q30: Seeding & Turfing

Q31: External Planting - 5no Quercus robur; 12-14cm RB

Q31: External Planting - 3no Quercus petraea; 12-14cm RB

Q31: External Planting - 5no Pinus sylvestris; 1m RB

Q31: External Planting - 5no Pinus contorta - 1m RB

Q31: External Planting - 3no Fagus sylvatica; 12-14cm RB

Q31: External Planting - 3no Betula pendula; 12-14cm RB

Q31: External Planting - 4no Tilia x europea; 12-14cm RB

Drawing 145(L)500_06 shows the planting detail.

Revision:	Date:	Details:	Drawn:	Checked:
A	15.05.19	Revised layout	KV	JG

Drawing revisions:

Drawing status:

PLANNING

Client:

MARCHSTONE BELLEFIELD LIMITED

Project Info:

BS5837:2012 TREE SURVEY FOR
THE PROPOSED HOUSING DEVELOPMENT AT
BELLEFILED ROAD LANARK

Drawing Info:

LANDSCAPE PROPOSAL

Scale:	Drawn by	Date:	Checked by
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Drawing No: Revison:

145 (S) 100_05 A

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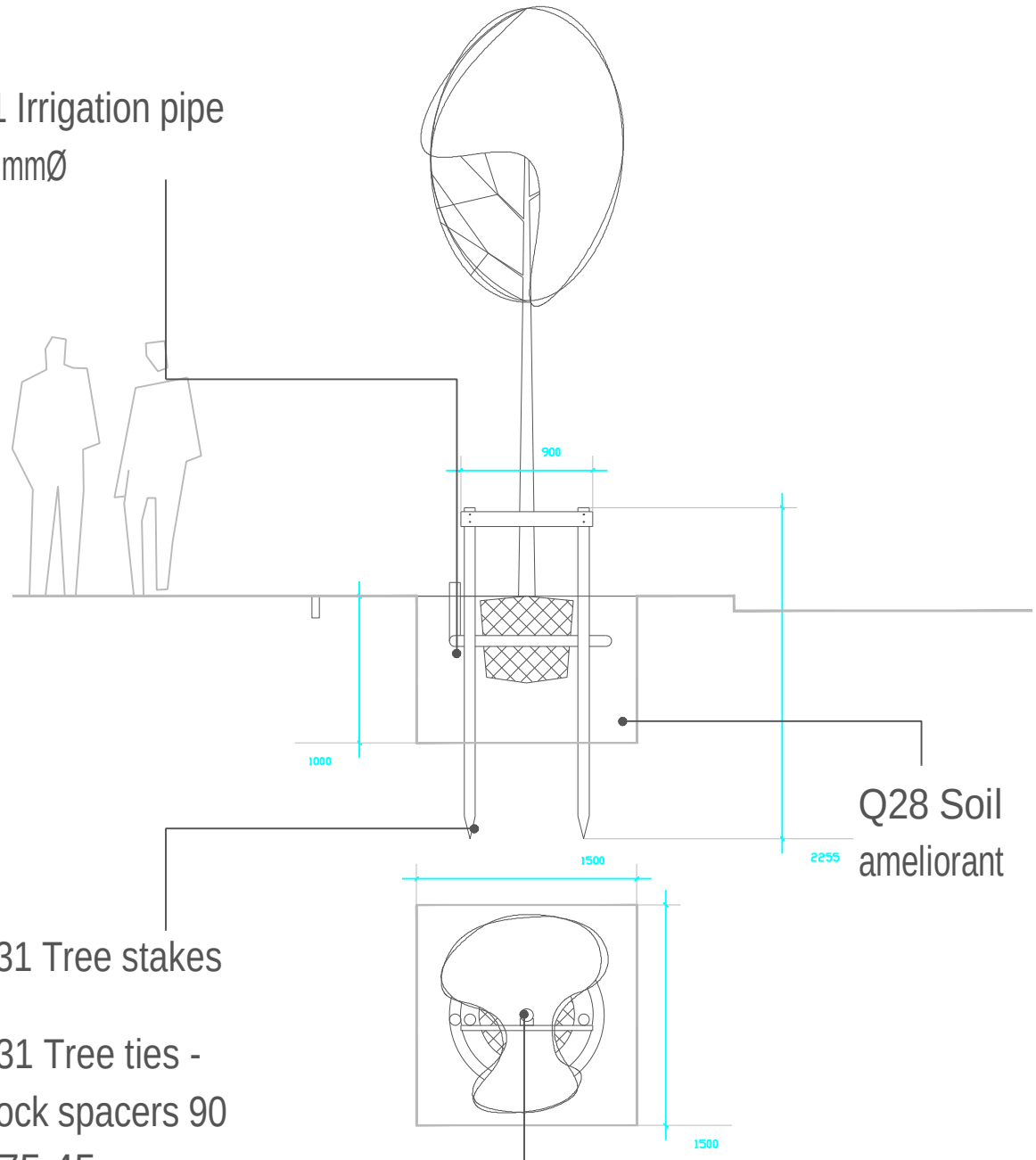
Appendix H

Landscape proposal – 145 (L) 500_06



Revision: Date: Details: Drawn: Checked:

Drawing revisions:

Drawing status:

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Client:

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Project Info:

PROPOSED HOUSING DEVELOPMENT AT
BELLEFIELD ROAD LANARK

Drawing Info:

Q31 TREE PLANTING DETAIL

Scale:	Drawn by:	Date:	Checked by:
NTS	KV	21.05.19	JG

Drawing No: Revision:

145(L)500_06

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