

Pre-development tree survey BS5837:2012, Tree Protection
plan and Arboricultural Method Statement
for Garden King Garden Centre,
Park Road, Swadlincote



For Bailey Design Ltd.

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Report Author:

Dr. Stefan Bodnar BSc (Hons) PhD MIEEM

Wallbrook farm

Allensmore

HR2 9BE

Tel: 07429 209549

Email: stefan.bodnar01@gmail.com

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Appendix 1: Site and tree images

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1.0. Introduction and Site Description

Bailey Design Ltd. commissioned Dr. Stefan Bodnar to undertake an arboricultural survey (BS5837: 2012) on trees within a development site at Garden King Garden Centre, Park Road, Newhall, Swadlincote.

The trees included within the survey and their relationship to the Development Footprint are identified on the drawing in Appendix 2, the aerial photograph relating to the site and photographs of trees involved are included in Appendix 1, together with examples of the trees concerned.

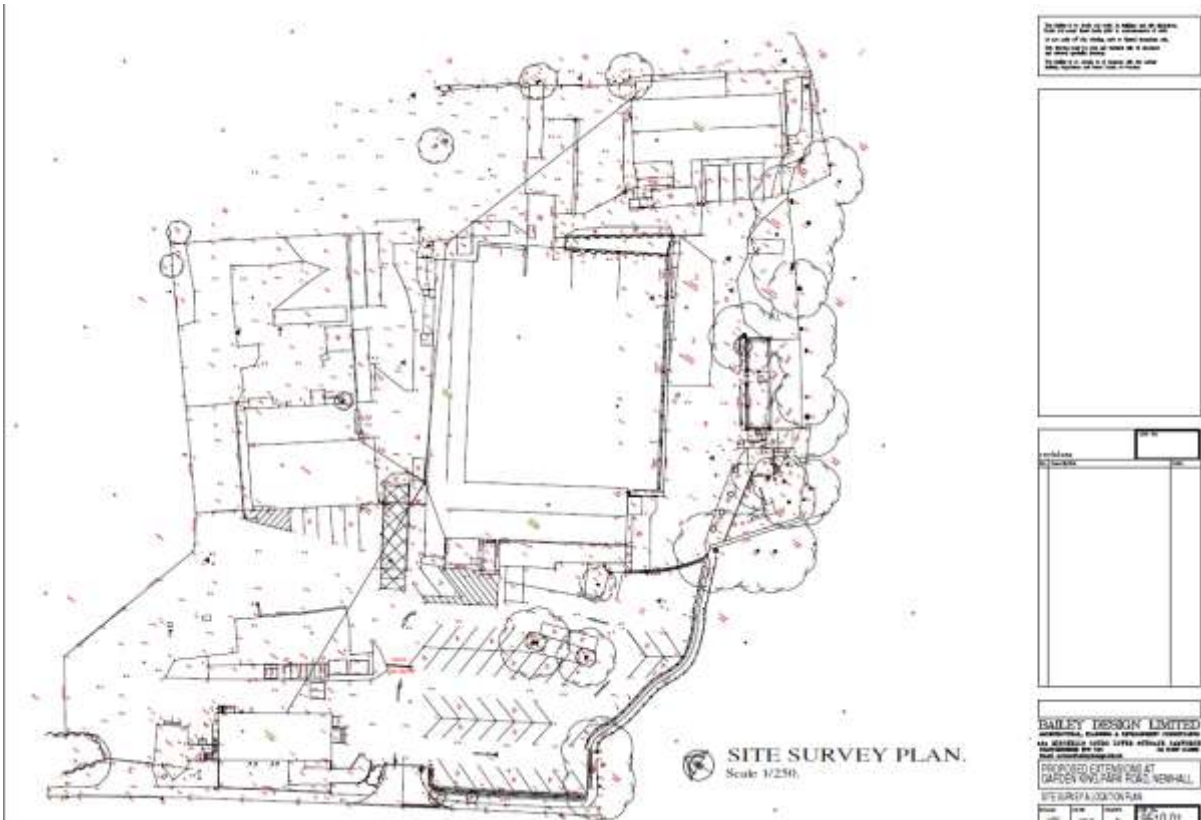
BS 5837:2012 includes an assessment of all trees within the development footprint in addition to those near to the site boundary. The site assessed is indicated in the location plan of trees (Appendix 2). See site plan below in Figure 1.

The trees indicated are woodland groups located along the site boundaries, adjacent to large native off-site woodlands, as well as a small number of on-site semi-mature planted garden trees. See aerial photograph (figure 2) and appendixes below. It is understood that none of the trees is protected by a Tree Preservation Order (TPO) though it is recommended that the client fully satisfy themselves that this is the case during contact with the Local Planning Authority.

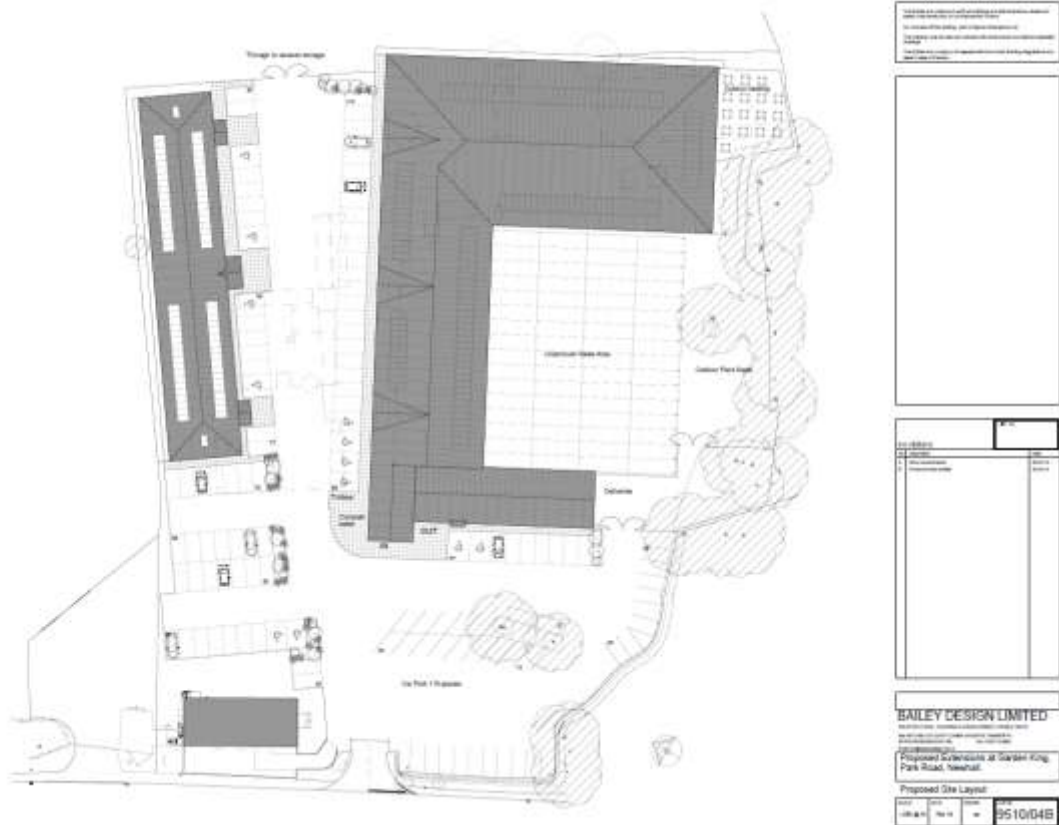
PROPOSED EXTENSIONS AT GARDEN KING GARDEN CENTRE, PARK ROAD, NEWHALL, SWADLINCOTE.



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Proposed Site Plan



2.0. Arboricultural Survey Methodology

Condition Status

To determine the status of the trees within the site a full arboricultural survey has been undertaken, assessing species and status of all trees present within the footprint of development. The survey has been carried out in accordance with BS 5837 (2012).

The surveyor has extensive experience of arboriculture, through undertaking BS5837 surveys on many sites between 2005 and 2019. Previous to this, he has undertaken Lantra approved courses for arborists, and is competent to the level of a tree officer operating within a Local Authority, being familiar and having used the systems undertaken by tree officers for undertaking safety and condition surveys for Birmingham City Council. Dr. Bodnar possesses numerous ecological qualifications including a full member of CIEEM and a PhD (Community Forestry, 1998). Recent Certificated BS5837 training (May 2015) from Tree Life Arboricultural Consultancy Ltd.

Individual trees above 75mm (diameter at 1.5m above ground level) have had their position confirmed on the survey drawing. The trees were visually assessed and a schedule prepared listing tree number, species, trunk diameter at 1.m above ground level, tree height, crown spread (radius), age, class and estimated remaining years. Any specific observation or recommendations with regard to management were also noted.

A plan drawing indicating the location of each tree assessed is included in Appendix 2.

The condition of each tree was assessed according to the following categories:

Category A

Those trees of high quality and value. Significant trees that are structurally sound and can be retained in the long term (i.e., >40 years) or trees that can be retained in the long term following remedial tree surgery. Colour code on the plan: pale green.

Category B

Those trees of moderate quality and value. Trees that may live 15-40 years. Trees that may live for more than 40 years, but whose removal may be required in that time frame to allow development of retained trees. Trees that are defective but could be retained in the medium term by remedial tree surgery. Colour code on the plan: mid blue.

Category C

Those trees of low quality and value. Trees that can only be retained in the short term (i.e., 5-15 years) and that have little landscape impact due to poor form or condition. Trees having a stem diameter of <150mm at 1.5m above ground level that could be replaced. Colour code on the plan: grey.

Category U

Unsuitable for retention. Trees that are dead, dying or diseased that will become dangerous in the near future (within years). Colour code on the plan: red.

Categories A, B and C have further sub-categories with regard to the reasons for tree retention:

- 1: Mainly arboricultural values
- 2: Mainly landscape values
- 3: Mainly cultural values, including conservation.

2.2 Root Protection Area (RPA)

In order to avoid damage to the roots or rooting environment of retained trees, the RPA has been calculated for each of the category A, B and C trees. This is a minimum area of m², which should be left undisturbed around each retained tree.

These figures are calculated utilising the formula below taken from BS 5837 (2012):

Single stem tree

$$\text{RPA m}^2 = \frac{\{ \text{Stem diameter (mm) @ 1.5 x 12} \}^2}{1000} \times 3.142$$

Trees with more than one stem below 1.5m above ground level

$$\text{RPA m}^2 = \frac{\{ \text{Basal diameter (mm) @ 10} \}^2}{100} \times 3.142$$

During construction works the root protection areas – ‘Construction Exclusion Zones’ are to be protected by barriers and ground protection in accordance with Section 9.0 of BS 5837:2012 and as specified and indicated on an approved Tree Protection Plan.

Where construction operations (demolition / hard surfacing) are proposed/ permitted within the Root Protection Area precautions should be taken to maintain the condition and health of the root system in accordance with BS5837:2012.

Construction of hard surfacing within the root protection area should be designed to avoid root loss during excavation. The structure of the hard surface should be designed to avoid localised compaction, including the use of three dimensional cellular confinement system as an integral component of the sub-base.

The hard surfacing in these areas should be a permeable and gas-porous nature such as washed gravel or paving slabs and block pavers (with infiltration spaces). Edge supports such as kerb and edgings on foundations and haunchings are not to be used within the RPA. Consideration should be given to the use of pegged timber edging or propriety or steelpaver or edge restraints.

3.0 Results

The site contains 4 woodland groups and a group of on-site Aspen trees, all of which should be retained and carefully protected during any development work with appropriate root protection fencing, as described below in section 4.2. Two of the woodland groups (WG1 and WG2) are A category trees, whilst WG3 and WG4 are B category trees. The group of on-site Aspen trees (G1) have also been classified as B category trees.

The remaining four trees on site; T1 and G2 (a hedge) & G3, have been classified as C Category trees. In general as many C category trees as possible should be protected and retained, however, as trees are to be removed to accommodate the proposed development, suitable replacement planting within the scheme area could adequately mitigate for losses of category C trees.

A map detailing the location of trees and their BS5837:2012 determined category can be seen in Appendix 2, all other trees on site are noted as being below 150mm stem diameter and therefore, outside the requirements of BS5837:2012. Trees below 150mm stem diameter but above 75 mm stem diameter are included in the topographical survey of the site. Appendix 1 contains images of all the trees and all significant specimens.

Scientific names for species identified:

Common Name	Species Name
Aspen	<i>Populus tremuloides</i>
Beech	<i>Fagus sylvestris</i>
Goat willow	<i>Salix caprea</i>
Hawthorn	<i>Crataegus monogyna</i>
Leyland cypress	<i>Cupressus × leylandii</i>
Oak	<i>Quercus robur</i>
Wild Cherry	<i>Prunus avium</i>

Tree no.	Species	Stem diam (mm) DBH	Crown S (m)	Crown W (m)	Crown E (m)	Crown N (m)	Height (m)	Age Class	Estimated remaining contribution (years)	Physiological and Structural Condition	Category	Root Protection area (m²)	Radius of nominal circle (m)
G1	Aspen	550	5	5	5	5	20	Mature	15-40		B2	6.60	137
G2	Leyland cypress hedge	225	1	1	1	1	8	Semi-mature	5-15	Hedge	C1	2.70	23
G3	English oak (3 trees)	200	3	3	3	3	7	Semi-mature	5-15		C1	2.40	18
WG1	English oak	500	6	6	6	6	17	Mature	40+	Mainly oak, with some hawthorn & goat willow. Understory of bluebell and dogs	A3	6.00	113
WG2	English oak	600	7	7	7	7	19	Mature	40+		A3	7.20	163

WG3	Hawthorn, cherry & Aspen	200- 250	3	3	3	3	8-10	Semi- mature	15-40		B3	3.00	28
WG4	Goat willow	To 250	4	4	4	4	8	Semi- mature	15-40	Partly coppiced goat willow, with poplar and English oak also	B3	3.00	28
T1	Beech	175	1	1	1	1	6	Young	5-15		C1	2.10	14

T = Tree G = Group WG = Woodland Group

4.0 Discussion

4.1 Tree Protection:

4.1.1 Tree Removal and Retention Plans: The current development plans for the site indicate the removal of the trees in the central areas of the site, comprising T1. Suitable replacement planting, such as the proposed espalier apple trees, within the scheme area could adequately mitigate for losses of category C1 trees.

The trees vulnerable to damage on this site, include all the A and B Category trees around the site boundaries and within the adjacent Woodland Groups of trees, it is important that these trees are adequately protected during all development works with no-dig areas enforced within the tree protection zones. There should be no dumping of waste materials outside of site boundaries within the adjacent woodland or within the tree protection zones.

All of the A and B category trees and remaining C category trees, should be retained and incorporated into the development. To ensure equilibrium between these trees and the new development, the physiological requirements of trees must be carefully considered within the layout. Once the right balance is found, this will ensure that they are a true asset to the site and go on to provide a wide range of material considerations for their perceived life expectancy.

In general, development should aim to primarily retain trees in the 'A' and 'B' Categories and as many of Group 'C' as can be retained depending on the design plan. If trees are to be removed to accommodate new development, suitable replacement planting within the scheme area could adequately mitigate for losses of category C1 trees. It is recommended that additional tree planting be undertaken to replace any trees which will be removed at a minimum of a 1:1 ratio with native nectar rich and berry bearing native trees.

4.1.2 Avoiding Accidental Damage to Trees: Trees may be negatively affected by the construction period by both direct and indirect actions, which are often borne out of ignorance as to the tree physiological requirements. Careful site planning and management along with the implementation of robust physical protection measures is necessary to ensure the retention of important trees.

4.1.3 Soil and Root Protection: It is essential to safeguard a pre-determined volume of soil around the base of the retained trees to ensure that then ongoing biological functioning of the root system along with the interaction with the soil is not impaired. This requires, that prior to the commencement of development activity on site that a robust protective barrier is erected.

4.1.4 Suitable Barriers: The specifications for this barrier should be as per the British Standard 5837 of 2012 (Trees in Relation to Construction – recommendations). In brief, this consists of 2.3m high panels attached to an adequately braced scaffold structure to deter un-authorized dismantling and robust enough to rebut physical impacts from site plant and machinery. In practice Heras weld-mesh type panels perform well when attached to the above mentioned scaffold structure.

4.1.5 Bird breeding season: All site clearance should ideally take place outside of the bird breeding season. Bird breeding season is between mid March and mid July, although certain species can breed outside these months and if breeding birds are found then work should cease and the advice of an ecologist sought. If clearance is undertaken within the bird breeding season then all site features should preferably be checked immediately prior to clearance by a suitably qualified ecologist.

4.1.6 Shading: The trees on the site are located along the edges of the site and therefore sufficient distance from the proposed development to ensure shading should not be a problem.

4.2 Tree Protection & Ground Protection

4.2.1 All trees that are being retained on site are to be protected by barriers and/or ground protection before any materials or machinery are brought onto the site, and before any demolition, development or stripping of soil commences. Where all activity can be excluded from the RPA, vertical barriers are to be erected to create a construction exclusion zone. The default barrier specification is to be in accordance with BS 5837:2012 ‘Trees in Relation to Design, Demolition and Construction - Recommendations’ as illustrated in Figure 3 below.

4.2.3 All weather tree protection posters (an example is detailed in Figure 4 below) are to be securely fixed to the tree protection fencing in plain view.

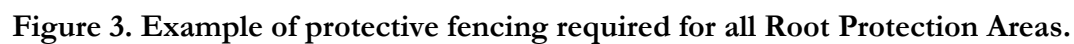




Figure 4. Example of an all weather tree protection poster.

4.2.4 Care is to be exercised when locating the vertical poles to avoid underground services and, in the case of the bracing poles, also to avoid contact with structural roots. If the presence of underground services precludes the use of driven poles, an alternative specification that provides an equal level of protection is to be prepared in conjunction with the project arboriculturist as illustrated within Figure 3 above.

4.2.5 Where the set-back of the tree protection barrier exposes unmade ground to construction damage, temporary ground protection is to be installed as part of the implementation of physical tree protection measures prior to work starting on site.

4.2.6 Temporary ground protection is to be capable of supporting any traffic entering or using the site without being distorted or causing compaction of underlying soil. Detail is shown in Figure 5 below: Scaffolding and root protection within the RPA.

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 2t, 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 2t 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.

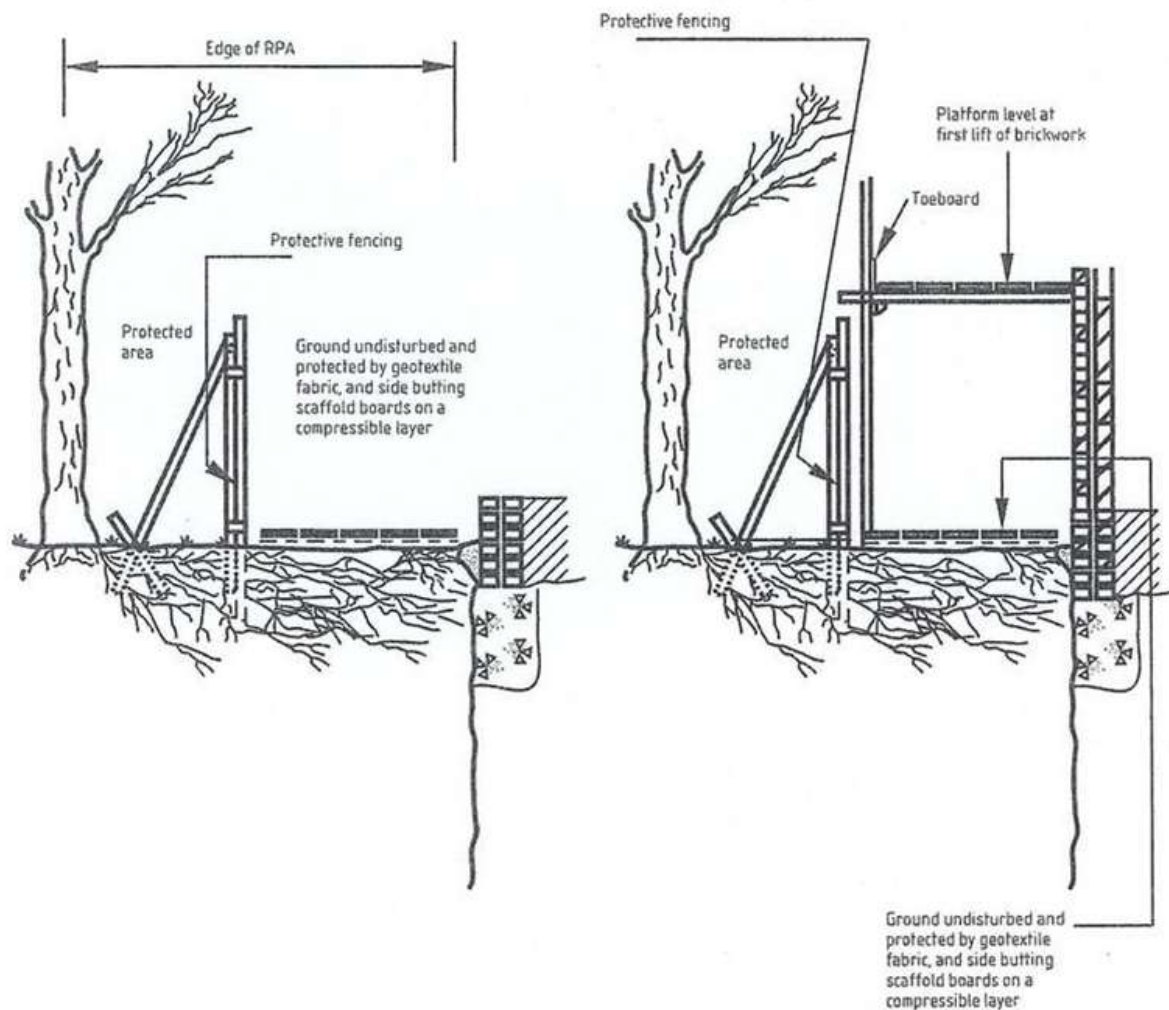


Figure 5. Scaffolding and root protection within the Root Protection Area.

4.3 Landscape considerations:

Consideration should be given to landscape impacts and reinforcing site boundaries. Further consideration should be given to the appearance of frontages and screening. The appropriate landscape mitigation and compensation will need to be discussed at the pre-application stage with the appropriate Local Authority Planning Landscape Officer. It is recommended that compensation planting is undertaken and located to enable the landscape value of this area to be reinforced, if any trees with landscape value are to be removed from the site.

4.4 Mitigation and Compensation:

In compensation for the loss of any of the existing trees, at least an equal number of native trees should be planted as part of the new development. The trees will be species that have wildlife benefits and are sympathetic both to the existing tree structure and suitable for their likely eventual size limitation, such as hawthorn, elder, rowan, crap apple, and silver birch. All trees will be planted as 9-10cm Light Standards. All appropriate British Standards will be applied in terms of planting specifications.

REPORT ENDS

Appendix 1: Images of trees and shrub vegetation







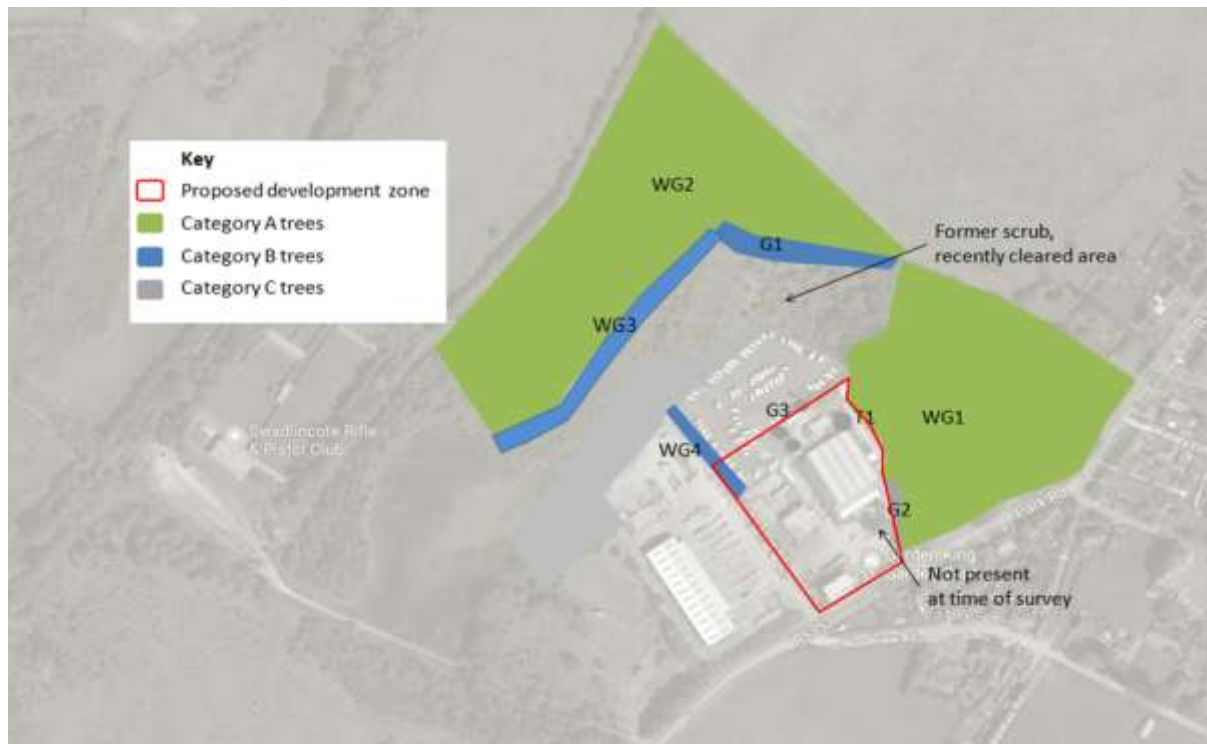








Appendix 2: Tree location map



Category A: Those trees of high quality and value. Significant trees that are structurally sound and can be retained in the long term (i.e. >40 years) or trees that can be retained in the long term following remedial tree surgery. Colour code on the plan- pale green.

Category B: Those trees of moderate quality and value. Trees that may live 15-40 years. Trees that may live for more than 40 years, but whose removal may be required in that time frame to allow development of retained trees. Trees that are defective but could be retained in the medium term by remedial tree surgery. Colour code on the plan- mid blue.

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Category U: Trees that are dead, dying or diseased that will become dangerous in the near future (within years). Colour code on the plan- red.

Appendix 3: Tree Protection Fencing

