

BS5837:2012 Tree Survey & Tree Protection amended plan

Site Address

8 Densley Close,
Welwyn Garden City
Hertfordshire,
AL8 7JX

Site Surveyed by Peter Holloway

Report prepared by
Karl Underwood & Peter Holloway BSc(Hons) FArborA
CEnv

Date 8th July 2015

Report Prepared for: Mr and Mrs Hooley

BS5837 Tree Report: Tree Protection at 8 Densley Close WGC

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1. Introduction

- 1.1 I am instructed by Mike Hill on behalf of Mr and Mrs Hooley.

My brief is to produce an amended Arboricultural Impacts assessment, Tree Protection Method Statement and Tree Protection Plan, for a revised proposal to construct garden buildings.

- 1.2 There is an existing planning permission (N6/2014/2746/FP & W/2014/2794/EM). This consent was granted subject to a number of conditions including:

Existing trees, hedges or other soft features to be retained and an Arboricultural Method Statement which should include:

- I. Details of removal of existing structures and hard surfacing
- II. Details of any proposed tree work required to facilitate the development.
- III. Details of any temporary ground protection.
- IV. Details of any protective fencing (Type and precise location from a fixed point).
- V. Details of storage areas for building materials.
- VI. Details of any site supervision by a qualified arboriculturist.

2. Documents

- 2.1 I was supplied with the following documents in relation to the existing development that has planning consent:

- a) Ground Floor Plan as Existing, 2223/EX/1, Nov. 2014.
- b) First & Second Floor Plans as Existing, 2223/EX/2, Nov. 2014.
- c) Elevations as Existing, 2223/EX/3, Nov. 2014.
- d) Elevations & Roof Plan as Existing, 2223/EX/4, Nov. 2014.
- e) Site Layout Plan as Existing, 2223/EXSP/1, Nov 2014.
- f) Ground Floor Plan as Proposed, 2223/P/1, Dec. 2014.
- g) First & Second Floor Plans as Proposed, 2223/P/2, Dec. 2014.
- h) Elevations as Proposed, 2223/P/3, Dec. 2014.
- i) Elevations & Roof Plan as Proposed, 2223/P/4, Dec. 2014.
- j) Site Layout Plan as Proposed, 2223/PSP/1, Dec. 2014.

- 2.2 I used the following additional sketches for this amended Impact assessment: I transferred an approximation of the details of the proposal (2.2.n) on to my site plan with tree constraints.

- k) Crane Sheds Drawings. Undated web page print.
www.cranegardenbuildings.co.uk/create-garden-buildings/superior
- l) Draft Design & Access Statement for garage and shed dated June 2015.
- m) Garage and shed drawings. Existing Site Layout dated June 2015. 2223/EX/SHEDS/1.
- n) Garage and shed drawings. Proposed Site Layout dated June 2015. 2223/P/SHEDS/1.
- o) Garage and shed drawings. Proposed Elevations dated June 2015. 2223/P/SHEDS/2.

3. Description of Proposal

- 3.1 The site is a detached house in a cul-de-sac. The house has a large rear garden on its west side. The southern portion of the garden is woodland in nature. The central and northern part of the garden is classic lawn with shrub borders and small trees. The front garden has a shrub border, paving, off street parking and a single weeping Ash tree.

- 3.2 This is a revised report to include the erection of two out buildings. These consist of a timber garage and a shed. The timber garage is 2.5m high and 6x3m in plan. The shed is also 2.5m tall and 4.8x3m in plan. These buildings are constructed within the RPA of the Common Ash (T3) and the Cherry Laurel (T7).

- 3.3 The timber garage will be used for a classic car and so there is a planned access route through the existing garage into the rear garden and with access to the timber garage. The access route passes over the RPAs of a common Ash (T3) and a common Hornbeam (T4), will also be affected by this proposal.

- 3.4.1 The smaller shed in the south east corner of the site will be divided and used as a home office and to store a ride-on mower. The proposal includes a path for taking the mower and pedestrians between the patio and the lawn. Ride on mowers have a low ground pressure so the path would be built to a low specification and a home office will require services for light, heat and equipment and also computer infrastructure.

- 3.4.2 I do not know the route for any services but it is likely they will follow the boundary wall perpendicular south of the existing garage where no trees will be affected.
- 3.4.3 The proposed pathway, as shown indicatively on the architects plan will affect the RPAs of T3, T4, T7, T8, T9 and T10. The snowy mespil (T8) and Holly (T9) are within the path and would need to be removed but I think this can be avoided by revising the route of this path.

4. Scope of this Report

- 4.1 This report includes:
- i. Tree Survey Data (Appendix 1)
 - ii. Arboricultural Impacts Assessment Plan (Appendix 2)
 - iii. Tree Protection Methodology (Appendix 3)
 - iv. Tree Protection Plan (Appendix 4)
- 4.2 I surveyed the trees on 20th December 2014 and all of the trees within the garden and those in adjacent gardens that might be affected by the proposal were surveyed. The trees were surveyed from ground level using a visual tree assessment method and no detailed tree examinations were undertaken during the survey.
- 4.3 I prepared a pre-planning arboricultural report dated 7th January 2015 and a Tree Protection Report dated 20th April 2015. I also visited the site on Tuesday 14th April 2015 to re-appraise the site and tree protection requirements. Rootcause Limited have carried out two Arboricultural Site Supervision visits on 11th May 2015 and 19th June 2015.
- 4.4 According to Welwyn and Hatfield Council's website the site is within the Welwyn Garden City conservation area and within the Estate Management Area which requires consent for various issues including landscaping, tree work and building extensions.
- 4.5 The Wildlife and Countryside Act 1981(as amended), the Conservation (natural habitats etc.) Regulations 1994, and the Countryside and Rights of Way Act 2000 provide protection for many species of animal that live in trees. This includes birds and bats. If any tree works affect protected species then this could be a criminal offence.

5. Summary of Arboricultural Impact

- 5.1 Tree numbers T5, T6, T13, T25, T34, T35 and T36 are dead or in poor condition. T5, T6, T34, T35 and T36 have already been removed prior to the approved construction. Where the risk is minimal the remaining trees should be retained for their wildlife benefit. T19 is a dead cherry but it is off site within third party ownership. It would be prudent to consult the owner of T19 to carry out remedial works to reduce the chance that this tree will fall. The tree can be pollarded or 'topped' to remove the crown of the tree to leave a more stable dead trunk which could provide benefits for wildlife.
- 5.2 The removal of T3 which would have been affected by the extended garage in the original proposal is still required as the tree will not tolerate the changes to ground levels and additional hardstanding within its RPA.
- 5.3.1 The current proposal includes the retention of the original garage without the approved extension. The garage will be modified to create a rear access into the rear garden so there is access for the lawn mower and a car.
- 5.3.2 The modification of the existing garage to create a through access will need a ramp to negotiate the change in levels from garage floor to rear garden. The proposed ramp is 5 m long with a fall of 150mm from the current garage floor level down to garden level. The ramp will have no impact on the RPAs of any retained trees. Therefore the design of the ramp and sub base is not critical for the health of retained trees.
- 5.3 Some of the proposed hard landscaped area has existing crazy paving. The patio forming part of the access road to the timber garage will affect the RPA of T4. The area affected is 35m² (29%) of the circular RPA.
- 5.4 The timber garage will affect approximately 1.5m² (3%) of the RPA of T3 at the periphery of the RPA this is negligible.
- 5.4.1 In addition to the timber garage there is a proposed shed which will be used in part as a home office and in part as a store for a ride-on mower.
- 5.4.2 The second shed is 4.8m x 3m in plan and 2.5m high. This will also encroach approximately 4.5m² (8%) into the RPA of the Ash (T3).

- 5.4.3 The path to the second shed for pedestrians and a mower will cover an area of approximately 24m² and affects the RPAs of T3, T4, T8, T9 and T11. This pathway is shown as 2-3m wide on the draft plans which is probably wider than necessary and it does not follow the route of least impact.
- 5.5 The soil, roots and tree branches of the all the retained trees will need to be protected during demolition and construction. Some of the existing hard surfaces can act as ground protection for manual excavations and small machinery. The ground may be exposed during foundation, floor slab and path/patio construction so ground protection will need to be planned for this stage of the work.
- 5.6 The timber garage will require lighting and heating to a degree. New services will be required and although the route of any electrical service is unknown it can be distributed from the existing garage to the timber shed and garage without affecting the RPA of retained trees.

6. Mitigation

- 6.1 The retained trees can be protected during construction of the wooden sheds.
- 6.2 The Foundation for the shed will be a 100mm thick reinforced concrete raft with minimal excavations and so the impact of the foundation will be minimal. The Timber garage will have a more substantial foundation and hardcore base but the impact of this shed is minimal.
- 6.3 The patio and paths, where they affect the RPA of retained trees must be no dig or minimal excavation to minimize root damage. It is proposed to use a no-dig or minimal dig surface using cellweb and gravel in place of a deep hardcore base.
- 6.3 The path to the mower store will be low specification and home office can be adjusted to minimize the impact on retained trees and narrowed to 1.2m but this is sufficient width for a mower and a person. A gravel path is proposed but gravel is a poor surface for maneuvering a mower and a paved or bonded surface may be more suitable. I would suggest that this path is informal formed of wood chippings with a timber edge retainer.

7. Tree Protection

- 5.1 This modified proposal requires work inside the retained tree's root protection areas. I expect materials for this revised report will be wheelbarrowed through the garage or down the side of the house some materials will be stored inside the house and the garage. There is sufficient space for working, storage and site accommodation to minimise the impact on the retained trees. I have attached an arboricultural (tree protection) method statement for this project in Appendix 3.
- 5.2 The tree protection proposals must not be altered without approval of the project arboriculturist or local authority tree officer.
- 5.3 New services can be located outside of the RPAs of the retained trees.

6. Appendix 1 – Table 1 ‘Tree data’

Tree Table

Key to Tree Table

Tree number: the tree numbers used in the table corresponds to the plans in the appendices.

Species: the common and botanical names of each tree.

Height and **branch spread** are estimated in metres.

Stem diameter has been measured at 1.5m above ground level (a.g.l.). It is listed in the table in mm.

Estimated dimensions
* estimated dimensions

Height of crown above ground level (a.g.l.): gives an indication of whether the crown extends to the ground, or has low hanging branches.

Age class: this refers to the age of the individual tree relating to the average life expectancy of each species in a similar environment.
Y - young
MA - middle aged
M - mature
OM - over mature

Physiological condition: general state of health of the tree, good (G), fair (F), poor (P) or dead (D).

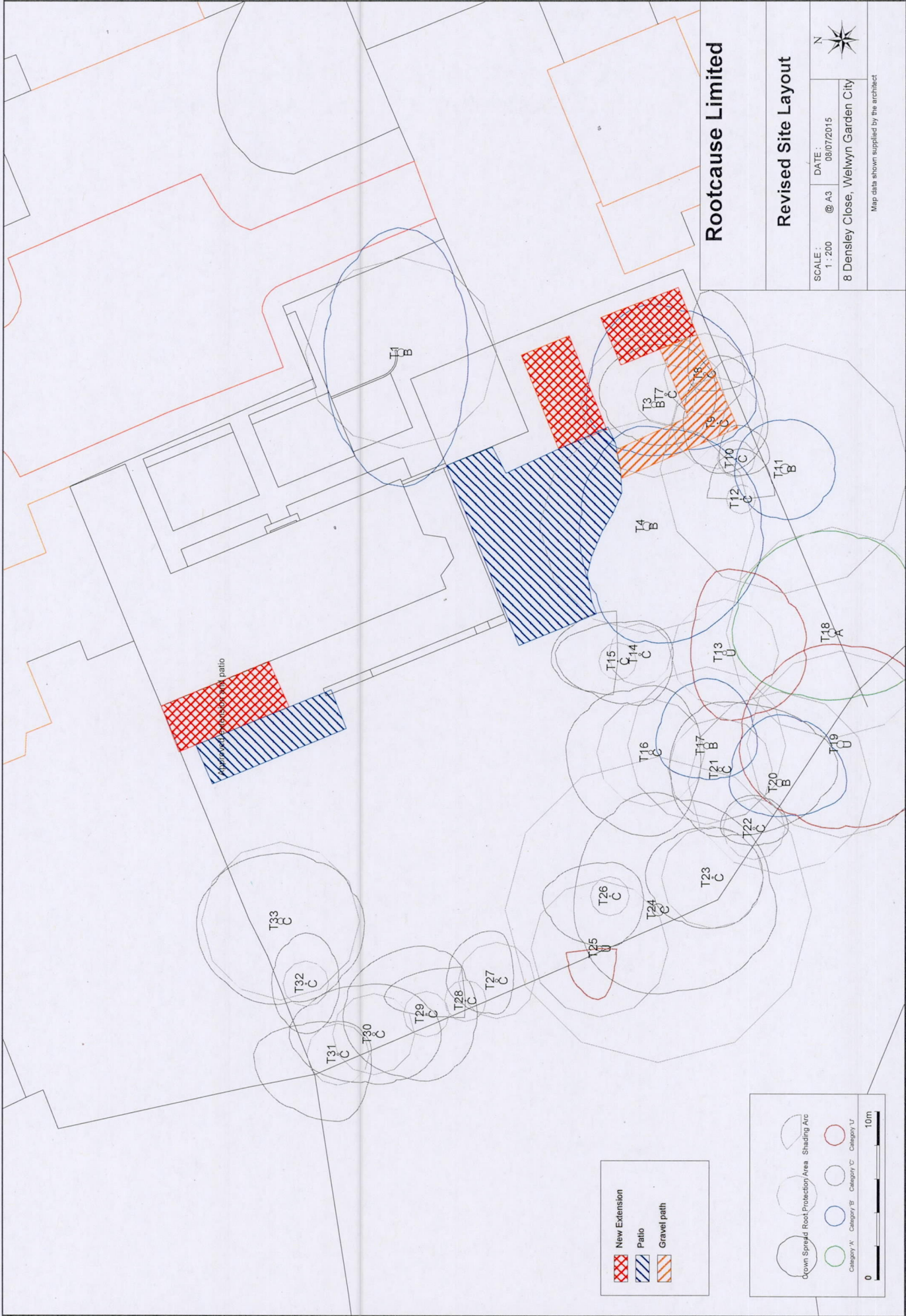
Structural condition: Any defects/ habits/previous management of note.

Remaining contribution in years: has been estimated by taking the age of the tree away from an estimate of the total number of years the tree may live for in those conditions, it has been banded, as recommended in BS5837:2012.

Retention category: each tree is given a category from the guidance in BS 5837:2012.

Table 1		8 Densley Close, Welwyn Garden City, Hertfordshire.										Weather: Cloudy occasional rain					20-Dec-14				
Tree Number	Tree Name (species)		Estimated dimensions	Height (m)	Calculated Stem Diameter (mm)	Number of Stems	Root Protection Area		Crown constraints			North (m)	South (m)	East (m)	West (m)	Age class	Summary of Physiological condition	Observations	Remaining contribution years	Tree Category	Tree work recommendations
	Common	Botanical					Radius, m	Area m2	Crown height (m)	Lowest branch (m)	Direction of lowest branch										
T1	Weeping Ash	Fraxinus pendula		11	460	1	5.5	96	1	2.4	N	4.5	8	4	8	D	Fair	Species has defects in branch formation. Pruning to maintain shape and structure important.	>40 yrs	B1	Remove major dead wood, lift crown to 4m, reduce crown 1-3m to shape.
T2	Common Hornbeam	Carpinus betulus		19	671	5	8.0	203	3	3	SW	9	6	5	7	D	Good	Fire damage to north side historic. More serious fire damage to two southern stem recently. Grading and contribution affected.	10 to 20 yrs	C1	Lift crown to 4m
T3	Common Ash	Fraxinus excelsior		19	350	1	4.2	55	5	6	E	4	6	6	3	D	Good	Some deadwood over garden areas. Asymmetrical crown due to neighbouring trees.	>40 yrs	B1	No action
T4	Common Hornbeam	Carpinus betulus		18	1050	2	6.2	121	3	5	S	4	6	7	7	M	Good	Twin stem. Canker and bleeding on lower stem north side. Too low for fire damage - possible Honey fungus.	20 to 40 yrs	B1	Further inspection of roots and stem.
T5	Common Hazel	Corylus avellana		6	224	5	2.7	23	3	2	W	2	0	1	1	Y	Poor	Coppice. Serious fire damage. Main stems dead and decayed.	<10 yrs	U	Coppice to 0.5m.
T6	Silver Birch	Betula pendula		4.5	250	1	3.0	28	na	na	na				M	Poor	Dead stem. Retain for wildlife biodiversity.	<10 yrs	U	See Comment	
T7	Cherry Laurel	Prunus laurocerasus		8	148	2	1.8	10	1	1.5	S	4	3	3	3	M	Good	Cherry laurel casts dense shade for understorey in woodland garden. Removal recommended.	20 to 40 yrs	C1	Fell and treat stump with herbicide
T8	Snowy Mespilus	Amelanchier laevis		6	192	3	2.3	17	3	2	NE	1	5	3	1	MA	Fair	Deadwood, ivy, form poor as suppressed.	10 to 20 yrs	C1	No action
T9	Common Holly	Ilex aquifolium		8	220	6	2.6	22	0	1.5	AR	2	4	3	3	M	Good	Group of Holly	20 to 40 yrs	C1	No action
T10	Ashleaf Maple	Acer negundo		5	90	1	1.1	4	3	2	SW	1	2	2	1	MA	Fair	Remove stake. Species of maple a best guess.	20 to 40 yrs	C1	See Comment
T11	Levland Cypress	X Cupressocypariss leylandii	*	22	600	1	7.2	163	0	2	E	3	3	3	3	Y	Good	Offsite.	20 to 40 yrs	B1	No action
T12	Ashleaf Maple	Acer negundo		8	70	1	0.8	2	3	3	E	2	3	2	0	MA	Fair	No action	20 to 40 yrs	C1	No action
T13	Snowy Mespilus	Amelanchier laevis		9	260	4	3.1	31	4	2	SE	2	5	5	4	Y	Poor	Stem canker, dieback and deadwood.	<10 yrs	U	Coppice to 0.5m.
T14	Common Hornbeam	Carpinus betulus		10	150	1	1.8	10	2	3	W	5	2	2	3	MA	Fair	Squirrel damage in crown	>40 yrs	C1	No action
T15	Common Hornbeam	Carpinus betulus		10	90	1	1.1	4	2	3	W	4	3	0	2	MA	Fair		20 to 40 yrs	C1	No action
T16	Pissards Plum	Prunus atropurpurea		10	260	1	3.1	31	3	2	NE	5	4	3	5	MA	Fair	Owl box. Species uncertain. Foliage at height.	20 to 40 yrs	C1	No action
T17	Sawara Cypress	Chamaecyparis pisifera		15	380	1	4.6	65	3	1.5	W	3	4	3	2	MA	Fair	Deadwood over garden area.	20 to 40 yrs	B1	No action
T18	Common Ash	Fraxinus excelsior		20	510	1	6.1	118	5	6	NE	6.0	6.0	6.0	4.0	MA	Fair	Deadwood over garden area.	>40 yrs	A1	No action
T19	Wild Cherry	Prunus avium	*	15	450	1	5.4	92	6	5	S	6.0	6.0	6.0	5.0	MA	Poor	Dead tree offsite by boundary. Consult owner.	<10 yrs	U	Fall to stable height
T20	Sawara Cypress	Chamaecyparis pisifera		15	440	1	5.3	88	3	2	S	3.0	4.0	4.0	2.0	M	Fair	Two appressed stems. Tight union.	20 to 40 yrs	B1	No action
T21	Sawara Cypress	Chamaecyparis pisifera		9	250	1	3.0	28	0	1	W	3.0	4.0	7.0	4.0	M	Fair	Stem inclined SE.	10 to 20 yrs	C1	No action
T22	Sawara Cypress	Chamaecyparis pisifera		8	149	2	1.8	10	2	1	E	2.0	2.0	2.0	1.0	M	Fair	Twin stem, tight union.	20 to 40 yrs	C1	No action
T23	Common Yew	Taxus baccata		6	245	6	2.9	27	0	na	na	4	3	3	3		Good	Multistemmed.	>40 yrs	C1	No action
T24	Silver Birch	Betula pendula		20	738	4	8.9	246	2	2	N	5	7	7	5		Poor	Multistemmed. Rusty exudation on one stem. Tree in decline: tip dieback and deadwood	10 to 20 yrs	C1	Reduce crown by 3m
T25	Wild Cherry	Prunus avium		7	330	1	4.0	49	3	2	N	2	0	1	3		Poor	Dead tree	<10 yrs	U	Fall to ground level
T26	Sycamore	Acer pseudoplatanus		6	94	2	1.1	4	2	0.5	S	4	2	2	3		Fair	Twin stem.	>40 yrs	C1	No action
T27	Common Elder	Sambucus nigra		6	184	2	2.2	15	2	2	S	3	3	1	2		Fair		20 to 40 yrs	C1	No action
T28	Common Hornbeam	Carpinus betulus		5	100	1	1.2	5	1	3	E	5	2	0	1		Fair		>40 yrs	C1	No action
T29	Common Hazel	Corylus avellana		8	246	5	3.0	27	2	2	S	5	4	3	4		Fair	Some dead and broken stems	>40 yrs	C1	Coppice to 0.5m.
T30	Common Hornbeam	Carpinus betulus		13	197	2	2.4	18	2	2	E	5	3	4	3		Poor	Squirrel damage in crown - quite severe	10 to 20 yrs	C1	No action
T31	Common Hornbeam	Carpinus betulus		12	150	1	1.8	10	3	4	N	5	2	2	4		Good		>40 yrs	C1	No action
T32	Common Ash	Fraxinus excelsior		7	110	1	1.3	5	2	4	E	2	3	2	3		Fair		>40 yrs	C1	No action
T33	Winter Cherry	Prunus subhirtella		10	380	1	4.6	65	3	1.8	NE	5	4	5	5		Good	Rhus typhina. Stem exudate.	20 to 40 yrs	C1	No action
T34	Staghorn Sumach	Rhus typhina		5	100	1	1.2	5	3	2	W	3	4	3	2		Fair	Multistemmed	<10 yrs	U	Fell to ground level
T35	Bay	Laurus nobilis		5	196	6	2.4	17	0	0	na	2	2.5	2	2		Good	Rhus typhina. Stem broken just above ground. Inclined East	<10 yrs	C1	No action
T36	Staghorn Sumach	Rhus typhina		5	90	1	1.1	4	2	1	na	2	5	2	0		Poor	Leaves affected by rust.	<10 yrs	U	Fall to ground level
T37	Cherry Laurel	Prunus laurocerasus		5	158	10	1.9	11	0	0	na	1	2	3	3		Fair		20 to 40 yrs	C1	No action

7. Appendix 2 – Proposed Plan with Tree Constraints (Arboricultural Impact Assessment Plan)



8. Appendix 3 – Tree Protection Method Statement

- A3.1 The Roles and Responsibilities for Tree Protection on this site are as follows.

Arboriculturalist

Peter Holloway of Rootcause Ltd

- To provide an advisory role to the Construction contractor when required and periodically monitor tree protection arrangements.

Contractor

Darren Lawes, Quarrygate Ltd. The Roost, Main Street, Westbury, NN13 5JR.

- To manage the works on site as per the agreed methodology. Responsible for all operatives on site, how the works are to be executed.
- To liaise with Rootcause Ltd when necessary and endeavour to comply with all aspects of the methodology for working on or near trees or plants.
- The on-site building Contractor must incorporate a section in their site induction about working near trees and this document will be referenced in their method statements.

Property Owner

- Ensure that tree protection is included in the building contractor's contractual arrangements.
- Act on any appropriate advice to protect retained trees from the arboriculturalist, contractor, or tree officer.

A3.2 Tree Work

The Hornbeam (T2) will need to be removed prior to the erection of the two sheds and the installation of the turning / patio area and woodland path. The weeping Ash (T1) will need to be crown lifted to provide 4m clearance beneath the branches (this work was included in the previous construction proposal).

Two new trees are to be planted either side of the front path at the front of the completed building. This will be carried out during the landscaping phase.

All tree work should be carried out by suitably qualified tree surgeons, preferably an Arboricultural Association Approved Contractor should be used (www.trees.org.uk).

A3.3 Provision of information for all site operatives

A copy of the arboricultural method statement will be provided to contract managers or site managers.

A3.4 Erection of protective fencing and ground protection

- A3.4.1 Tree Protective fencing as described in BS5837 consists of 2m tall by 3m long weldmesh panels fixed to a scaffold framework so they cannot be easily moved or breached. If there are no heavy plant or machinery used at the site then a more modest form of fencing can suffice. I have indicated the approximate position of the tree protective fencing on the Tree Protection Plan in Appendix 4. The fenced areas become a construction exclusion zone. It would be acceptable to fix the fencing to stakes rather than scaffold as long as the fence cannot be moved or breached easily.

- A3.4.2 The existing hard standing area will act as ground protection for the anticipated construction methods for the garage and side extension. This will allow access beneath the crown of the weeping Ash tree (T1). Therefore no machinery or equipment taller than 3.5m can be operated or moved beneath this tree.

- A3.4.3 Ground protection will also be required where access is required within root protection areas for construction of sheds and construction of paths and new hard surfacing. It would be more practical to construct the ramp and hard landscaping prior to shed construction as this will act as ground protection during construction. Temporary ground protection can be provided on any remaining open soil as indicated. A schematic plan showing a patio construction using cellweb is included in appendix 5.

- A3.4.4 British Standard 5837 describes Ground Protection as follows:

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

A3.5 General tree protection precautions during construction

- A3.5.1 Tall machinery must not be operated where the jib could strike the crowns of the retained trees wherever practicable.
- A3.5.2 No materials should be stored within the Root Protection Area (RPA) of retained trees. This not only breaches the tree protection and can lead to soil compaction or contamination but it can also create a source of combustible material where an accidental fire could destroy the tree. If it is necessary to use space beneath retained trees additional precautions are required.
- A3.5.3 Many building materials are toxic to trees. Excess cement, cement washings, waste water, diesel fuel and even clean water in excess can kill or seriously damage trees. Any runoff or spillages should be controlled so that they do not contaminate the RPAs of retained trees or landscape areas.
- A3.5.4 Changes (increases or decreases) in ground levels within the Root Protection Area will kill roots and harm the tree. Changes in soil levels around trees during landscaping or construction must be avoided unless approved in advance project arboriculturalist or the local tree officer. The extension within the RPA of T1 will require special care to minimise excavations and damage to roots and soil that roots are growing in.
- A3.5.5 Where possible combustible materials should be kept at least 10m from the crown of a retained tree in case of accident. If not, suitable fire-fighting equipment should be to hand while work is in progress.

- A3.5.6 Trenches for services (electricity, gas, water etc.) can damage tree roots. Service runs should be routed to avoid the Root Protection Areas of any retained tree. If services are unavoidable within the RPA then it will be necessary to undertake excavations by hand and all roots in excess of 25mm must be retained as described in National Joint Utilities (NJUG) guide 10 and section A.3.9 of this report. If this is not possible further arboricultural advice is necessary.

A3.7 Site Supervision

- A3.7.1 The Local Tree Officer could visit the site at any time to check that the planning conditions, including this method statement are being followed.
- A3.7.2 Independent arboricultural supervision is sometimes a condition of planning consent and is often included in the Tree Protection Method Statement. The planning condition for this site asked for details of any proposed site supervision.
- A3.7.3 I recommend arboricultural site supervision at the following times:
- When tree work is carried out to ensure the correct trees are removed and pruned.
 - Once tree protection fences are erected and ground protection installed.
 - At the commencement of any works within the RPA of retained trees.
 - Periodically (usually once per month) to ensure that tree protection is in place and effective.
 - On completion of the project when tree protection is removed and landscaping is taking place to ensure that retained trees are still in good condition.

A3.8 Landscaping

- A3.8.1 New hard and soft landscaping must retain existing soil levels within the RPAs of any retained trees. Soil preparation (rotovation and ripping) must be avoided within the RPAs of retained trees.

A3.9 Method for Hand Excavations within Root Protection Areas.

A3.9.1 If excavations are required within the RPA of any retained tree (Grey circle on plans accompanying this report) then they must be carried out as described below unless otherwise agreed with an arboriculturist.

A3.9.2 The purpose of the excavation is to establish the presence/absence of significant roots within the RPA's of retained trees so that significant roots can be protected and avoided by relocating any underground structures and retaining large roots. **If in doubt contact the project arboriculturist or local authority tree officer.**

Method:

- a) Excavations will use hand tools like forks, spades and shovels. An 'Air Spade' could be used in special cases but the depth of excavations is limited with these tools. Other power tools must not be used.
- b) During excavations any roots less than 25mm should be cut cleanly to the sides of the excavation with a pair of secateurs.
- c) Where practical all tree roots greater than 25mm in diameter will be left in situ. If the structure cannot accommodate retained roots the structure must be relocated (i.e. drain, soak-away).
- d) The depth of the excavation will be as specified. Tree roots could be up to 1.5m below ground level on gravel soils or 1m on clay soils.
- e) Roots to be retained which are exposed for long periods will be covered with Hessian to prevent damage from high or low temperatures and sun scorch depending on the ambient weather conditions. They may also need to be protected with cut sections of plastic pipe to prevent physical damage, if excavations are close to them.

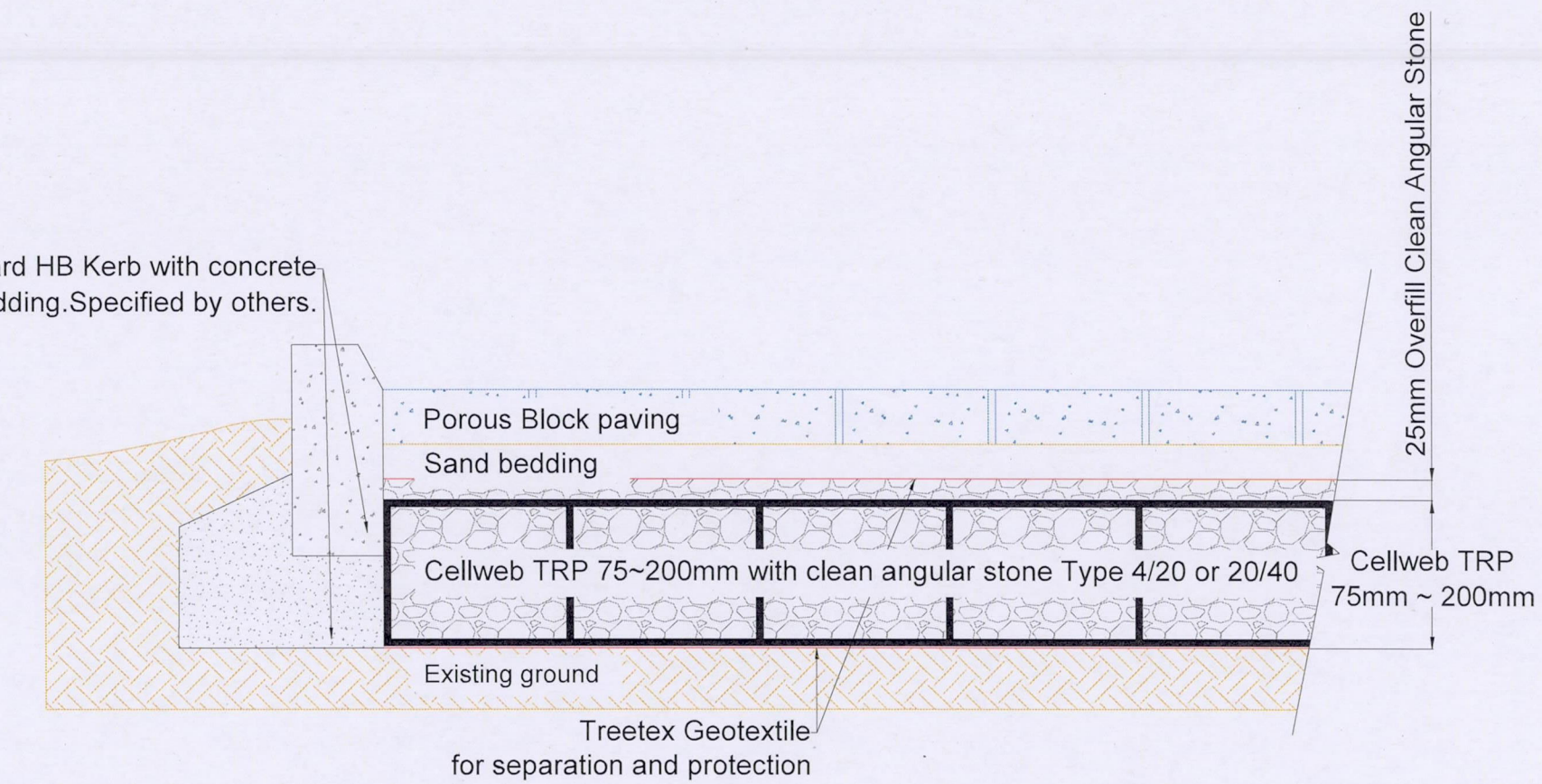
9. Appendix 4 - Tree Protection Plan



BS5837 Tree Report: Tree Protection at 8 Densley Close WGC

10. Appendix 5 – Recommended design of hard landscaping near trees

Standard HB Kerb with concrete bedding. Specified by others.



Note: Subbase could be required depending on the existing ground CBR % and the type of traffic on the surface.