B. J. UNWIN FORESTRY CONSULTANCY

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Site: **part of Branksome Care Home,**
56 St.John's Road, Buxton,
SK17 6TR.

Subject: **BS5837 Tree Survey**
Of site for proposed extension including:-

- **Tree Constraints on site.**
- **Arboricultural Implications of proposed re-development.**
- **Tree Retention & Tree Protection Method statement.**

ddf

Surveyor: Jim Unwin
Date: April 2014 stage 2 June 2014

Notes:

Limitation of Report:-The statements made in this Report do not take account of the effects of extremes of climate, vandalism or accident, whether physical, chemical or fire. BJUFC cannot therefore accept any liability in connection with these factors, nor where prescribed work is not carried out in a correct and professional manner in accordance with current good practice. The authority of this Report ceases at any stated time limit within it, or if none stated after two years from the date of the survey or when any site conditions change, or pruning or other works unspecified in the Report are carried out to, or affecting, the Subject Tree(s), whichever is the sooner.

Tree and Woodland Consultancy
Woodland Valuation and Timber Sales
Landscape Management

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Visual Tree Assessment

Branksome - Contents

1. Instruction

1.1 Jason Asbury of Pharaoh Designs Ltd is assisting Four Counties Health Care on extension to the Branksome Care Home. He has asked B J Unwin Forestry Consultancy to advise on tree issues on this site, subject to quote.

1.2 The local authority (High Peak Borough Council) will require a tree impact assessment and tree protection method statement as part of applications for re-development. The local authority may also require mitigation by new planting for any trees lost as part of re-development of the site.

1.3 Therefore methodology of the report below follows *BS5837:2012 Trees in Relation to Design, Demolition & Construction*.

2. Objectives of Tree Survey

2.1 Objectives of Tree Survey:-

- To provide an accurate measured survey of significant trees to *BS5837,* As per figure 1 flowchart overleaf.
- In addition, the site's trees have been considered in their landscape setting, and photos taken to show internal and external parts of the site from various viewpoints.
- The report aims to inform decision-making of Architects and Planners to:-
  -incorporate worthy trees within any development plans
  and associated landscape schemes,
  -protect them during development and
  -assist with planning of ongoing tree maintenance.
  Please note, BS5837 is an iterative process: which cannot all be included in one report.

Stage 1:- **Tree survey and preliminary constraints plan (TSCP).**

Stage 2 has several sequential phases:-

- **Design review to test proposed layout.**
- **Arboricultural Implications Assessment (AIS).**
- **Arboricultural Method Statement (AMS) & Tree Protection Plan (TPP).**
- **Discharging planning conditions.**
- **Implementation and supervision of tree work and protective measures.**

So BS5837 requires an iterative progression interlocking with other specialists in the developer's team: plus interaction with the lpa staff (engineer, planner and tree officer).

- This report is TSCP + AIS + AMS + TPP.

2.2 We have used topographic surveys by Tower Surveys ref R-N9224/201 of March 2014. This covers only part of the site, so we have added extra trees.
Our Tree Protection Plan is based on Pharaoh Designs Ltd **Branksome Extension 04//04/2014 Rev.A.**

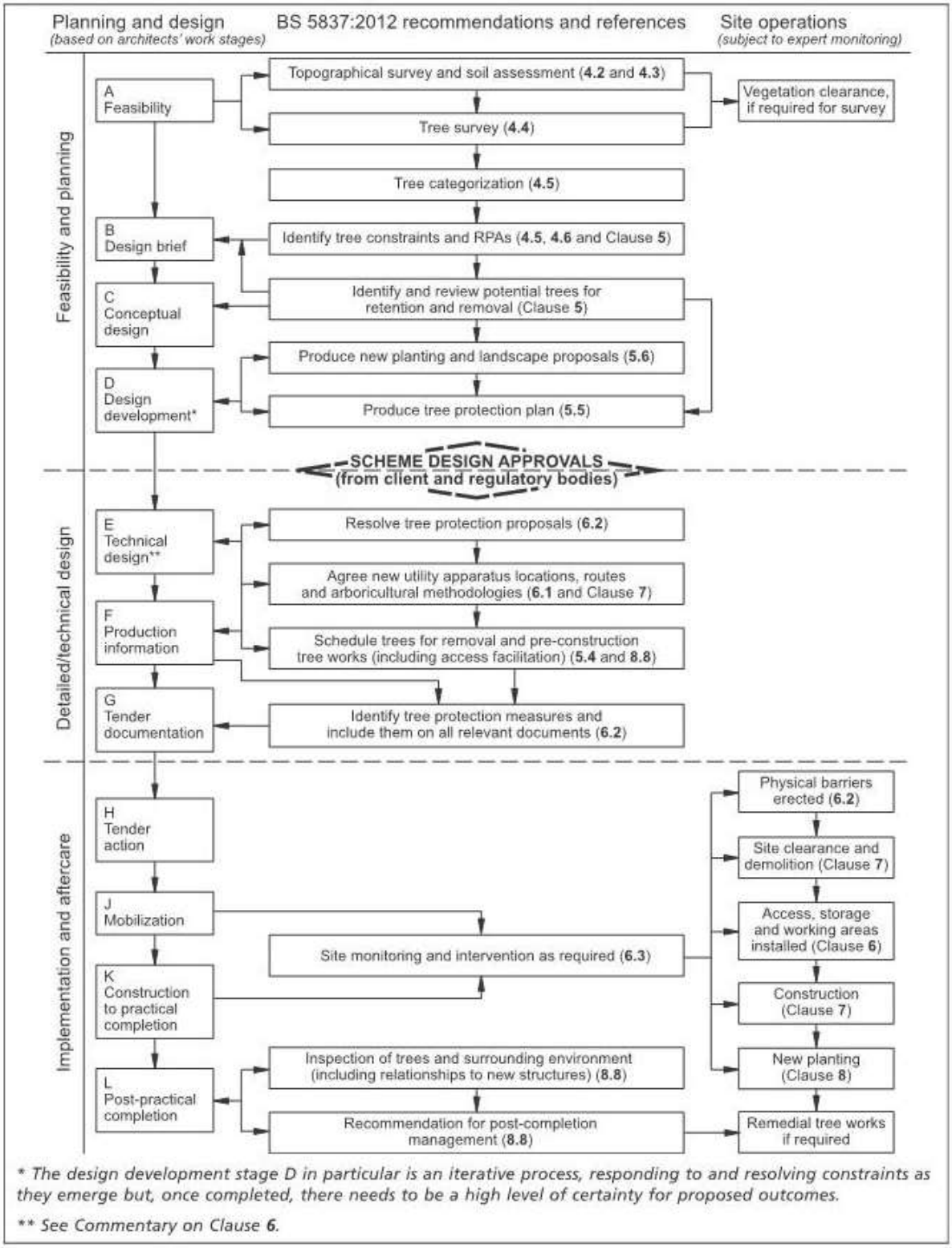
3. Survey

3.1 The survey was conducted from ground level, involving visual observation; and measurements of locations, crown spread in four directions, height and dbh with laser Disto, tapes, pacing & hypsometer (Visual Tree Assessment: Mattheck and Breloer, 1994 and Lonsdale, 1999). Bases of suspect trees were sounded with a hammer and probed for defects with a chisel and steel rod.

3.2 WE INSPECTED ALL TREES ON SITE BUT ONLY RECORDED TREES WHICH COULD BE IMPACTED BY DEVELOPMENT OR WERE HAZARDOUS.

3.3 This survey was carried out, unaccompanied, on 28th April 2014 by Jim Unwin (Professional CV in appendices). Home Manager Ian Magno was informed of the need for some safety-related tree works.

Figure 1 **The design and construction process and tree care**



** The design development stage D in particular is an iterative process, responding to and resolving constraints as they emerge but, once completed, there needs to be a high level of certainty for proposed outcomes.*

*** See Commentary on Clause 6.*

4. Results of Survey

4.1 Physical

4.1.1 Survey Site details:

The site is large, about 155m south-west to north-east, by 106m south-east to north-west. The large (Edwardian?) house sits at the highest point in the north-east corner. Various extensions and outbuildings of no architectural merit extend west.

Access is via a long front drive following the bank of the River Wye which runs through the site in a shallow valley, to reach small parking areas around the buildings. A service entrance drops into the site's north-east corner off Carlisle Road.

The south-western half of the site is dense unmanaged scrub woodland, the rest is mature garden.

The northern boundary is a high brick wall retaining higher ground to the north.

Underlying Solid geology is:- **Bowland Shale Formation - Mudstone, Siltstone And Sandstone. Sedimentary Bedrock formed approximately 313 to 335 million years ago in the Carboniferous Period. Local environment previously dominated by open seas with pelagite deposits (fine deposits laid down in deep water far from land).**

Superficial (Drift) deposits are:- **None.**

The site appears well drained.

4.1.2 Recent Landscape Maintenance:

The site is maintained to a modest standard immediately around the buildings. Tree maintenance or any maintenance of the wider site is lacking.

4.2 Landscape Setting of the Site

4.2.1 Photos:

Please refer to photos in Appendix III.

4.2.2 Land uses beyond the site:-

To the south west is Serpentine Wood public park.

To the south east is the busy A53 St. John's Road and its very attractive stone & iron bridge over the River. South of the road is woodland or wooded public open space.

To the north west is soft landscaped areas of The Paddock.

To the north east a stone retaining wall rises to the footway of Carlisle Road.

4.2.3 Prominence of the site in the local landscape:-

The Branksome site runs along a busy road, but is well screened by trees and vegetation.

4.3 Trees, hedges and large shrubs on or near site.

4.3.1 Trees on site:-

- The south-western half is woodland comprising open mature ash, sycamore & wych elm, over a very dense understorey of evergreen cherry laurel and rhododendron.
- The main drive is edged by close-spaced avenues of large old Lawson cypresses and other mixed trees including lime, holly & hornbeam.
- The roadside boundaries running east from the entrance and along Carlisle Road comprise pollarded sycamores, horse chestnuts and Norway maples, plus a dense understorey of yew, laurel, holly, beech etc.
- Throughout the site the original landscaped grounds have been invaded by ash & sycamore, for instance ash T16 destroying a garden path and T1 sycamore & T2 ash on the edge of the old formal garden.
- Beech T4 is a problematic tree. It is very large but leans significantly north east over the access drive and close to the building. It severely dominates the centre of the already-overgrown site. Additionally there are exposed roots on the tension side of the rootplate (see photos). Either it needs heavy crown reduction to restore balance, or better, complete removal to create some glade areas in a congested site.
- Japanese knotweed infests two small areas, so a concerted programme of chemical eradication is needed, over five years.

4.3.2 Trees nearby:-

- The site is edged by trees and open woodland on all sides. For instance:-
- Semi-mature mixed ornamental planting along The Paddock's road verge.
- Open mature woodland or wood pasture to the west, south west and south.
- Many garden trees east of Carlisle Road.

4.3.3 Visual Amenity of Trees

- Road frontage trees provide **high local visual amenity value: particularly to hide the large buildings from the roads**.
- Within the site it is hard top pick out individuals as the site is quite overgrown. However, all trees and shrubs contribute to site screening and privacy.

4.4 Detailed Tree Descriptions

4.4.1 Trees **on, or potentially influencing** the site, are individually described in the tables below, and shown on the plans in Appendix II.

Age class is described as:-

Sap: Very young tree, or sapling, one-five years old.
Y: Young tree less than fifteen years old and <1/3 fully grown.
Sm: Semi-mature tree having attained 1/3 to 2/3 full stature and 1/3 to 1/2 estimated lifespan.
Em: Early mature: tree at 2/3 to virtually full size, and halfway through its safe life.
M: Mature: fully-grown tree with useful life expectancy.
Lm: Late-mature: fully grown, of declining vigour, but still healthy.
Om: Overmature tree: fully grown and declining in health (but may still have many years of safe life).
Vet: Veteran: usually very old; of significant historic, habitat or cultural value.

Health / Condition:-

Self-explanatory:- **G**ood, **F**air, **P**oor, **D**ead / dying.

Remaining Safe Useful Life Expectancy: SULE

Prediction of safe useful years of life **in its location**, estimated as:-
<5 years, <10 years, 10-20 years, 20-40 years, >40 years.

***Retention** categories*, based on BS 5837 Section 4.3, are:-

Trees to Retain:

A = *High quality or value >40yrs safe life*: Light Green*
B = *Moderate quality or value >20yrs safe life*: Mid Blue*
C = *Low quality or value >10yrs safe life or young trees <150mm stem diameter*: Grey*

Trees to Remove:

U = *<10yrs safe life or should be removed for sound arboricultural reasons*: Dark Red*

(*Colour marking on relevant Tree plan)

Sub-category for retention (can be more than one category for a tree):-

1 = Arboricultural Value
2 = Landscape Value
3 = Cultural and/or Habitat Conservation Value

***BS 5837:2012 Root Protection Area*:**

The estimated volume of soil 1m deep required to sustain the tree, usually expressed as a disc 1m deep centred on the tree's trunk.

THE RPA CAN BE A VARIED SHAPE ENCLOSING THE CORRECT ROOTABLE AREA: but SHOWN AS A CIRCLE FOR CONVENIENCE.. Calculated as:-

Single-stem tree, radial distance **=** 12 x stem diameter at 1.5m ht.

Multi-stem trees 1-5 stems = *Square root of (sum of individual stem diameters squared).*
> 5 stems = *Square root of (average dbh squared x number of stems).*

4.4.2 **Branksome Care Home - BS5837– BJUFC inspection April 2014**

No T=tree S= shrub H= hedge G= group	Species	Dbh (stem diameter @ 1.5m ht) cm.	Total height m. Ht to base of crown. m. Est Ht in 10 yrs.	Crown radii m. North west North east South east South west	Age class	Cond-ition	SULE	Comment (All are in average to good health and condition, unless stated otherwise.)	Retention category A (best), B or C. Remove = U. Sub-category 1 quality 2 landscape 3 Habitat / heritage	BS 5837 Root Protection Area. M	WORK excluding Development
T1	Sycamore	54	15 2.5 16	6 5.5 4 5	M	F	>40	Good tree, on edge of wood. Minor tip dieback: may be squirrel damage.	B1	6.5	
T2	Ash	52	16 3 17	4 6.5 4 3	M	F	20-40	Pushed south west by T1. Old bonfire scar on south side, not serious. Overhangs building roof.	B2	6.3	Crown lift removing five bottom limbs, above roof.
T3	Flowering cherry	26	11 2.5 12	3 6 2 0.5	Em	P	10	Basal graft. Pushed east by hedge H11.	C1	3.2	

T4	Beech	93	19 4 19	8 11 5 7	M	F	10-20	Lean east north east. Some exposed roots on south west side suggest some rootplate movement. Dominates nearby building.	B2 size C1 quality.	11.2	Remove completely. Or attempt to re-balance by 4m off all parts of main stems to north and east. 3m off north and east sides.
T5	Lawson cypress	38	13 4 14	1.5 2 2 1	Em / M	F	20-40	Part of drive side avenue.	C1	4.6	
T6	Spruce	23	15 12 0	1.2m all round	Em	P	10	Part of drive side. Poor: spindly.	U		Fell.
T7	Lawson cypress	32	13 3.5 14	1.25 2.5 1.5 1.5	Em / M	F	20-40	Part of drive side.	C1	3.9	
T8	Holly	17, 20	9 2.5 9.5	2 3 1.5 1.5	Em / M	F	20-40	Part of drive side.	C1	3.2	
T9	Camperdown elm	36	4.5 1 4.5	3 2 2 3	M	F	10-20	Weeping elm. Grafted at 1.8m height.	C1	4.4	
G10	Lawson cypress x many	45	13 0 14	1.5 2 1.5 2	M	F	10-20	Northern tree of long mostly Lawson cypress avenue down drive.	B2	5.4	
H11	Leyland cypress	13-25	12-15 1.5 6	1.25m external	Em	F	10-20	Good hedge, tall and narrow.	C2	3.0	Top at 8m approx. half height, and shape in upper sides.
T12	Hawthorn	12, 17, 18	7 2 7.5	4 4.5 1.5 1.5	M	F	10-20	Three stem, self-sown, 1.6m west of garden wall.	C2	3.4	Crown lift east side.

T13	**Copper Beech**	**47**	**14 3 16**	**6 5 5 8.5**	**Em**	**F**	**>40**	**Prominent location, but badly lopped.**	**B1**	**5.7**	**Remove all of horizontal limbs to west. General crown clean to leave a narrower crown.**
T14	**Hornbeam**	**21**	**15**	**3 4 2 2**	**Em**	**P**	**10**	**Severe basal decay over drive.**	**C2**	**2.5**	**Pollard at 6m, below top of yew.**
T15	**Beech**	**20**	**4**	**1m all round**	**Sm**	**D**	**0**	**Small dead beech by entrance.**	**U**		**Fell.**
T16	**Ash**	**41**	**16**	**4 3 3 5**	**Em**	**P**	**<5**	**Self-sown, lifting path and brick work of garden hard landscape. Spoiling adjacent smaller trees.**	**U**		**Fell and treat stump. Also coppice all nearby cherry laurel overhanging roadside wall.**
G17	**Japanese knotweed**										**Foliar spray Glyphosate June & September each year x 5 years 'til gone.**
T18	**Sycamore**	**65**	**20**	**4 4 3 4**	**M**	**D**	**0**	**Long dead. Hazardous.**	**U**		**Fell ASAP.**
G19	**Japanese knotweed**								**U**		**Foliar spray Glyphosate June & September each year x 5 years 'til gone.**
T20 No paint	**Wych elm**	**40**	**20**	**4m all round**	**M**	**D**	**0**	**Hazardous close to road.**	**U**		**Fell ASAP.**
T21	**Small dead elms**							**By bridge and road.**			**Fell all ASAP.**

End of table.

5. Arboricultural Constraints, Impacts of proposed re-development on trees, and vice versa.

5.1 Proposed Development

5.1.1 The proposal is to demolish the existing derelict building west of the main buildings, and build a new two-storey care home extension.

5.1.2 Additional parking is created along the drive: 16 spaces are shown on the development plan in Appendix IV.

5.2 Tree Constraints and Impacts.

5.2.1 There are six potential arboricultural constraints to the development of the site:

- **physical contact of above-ground** parts of the tree,
- **below-ground** parts,
- **shading,**
- **over-bearing, and falling material,**
- **subsidence/heave, and root growth.**
- **impact on local amenity value.**

5.2.2 Trees are listed in table 4.4.2 above, and coloured on the Tree Plans in Appendix II below, to indicate their retention categories A,B,C,U: with the colours explained in the keys of the table & plan (A = best to U = remove). This allows the site designer to plan around important trees, and ignore lesser trees.

5.3 Physical contact of above-ground parts of trees.

5.3.1 General:-

Tree Plan in Appendix II shows tree locations and crown spreads.

Crown dimensions: spread in four directions, base of crown and tree height, are given in Table 4.4.2.

5.3.2 Specific above-ground impacts:-

- New parking replaces beech T13.
- New parking replaces end of overgrown Leylandii hedge H11.

5.4 Below-ground root spread.

5.4.1 General:-

BS5837 defines a tree's Root Protection Area as a disc of soil 1m deep required to maintain long-term health a full-canopied tree of a given stem size, usually 12 x stem diameter. We show it as an idealised circle. Rooting areas are never symmetrical, but ideally there should be no ground disturbance within the RPA zone. At the discretion of an arboriculturalist, the RPA can be offset if work is proposed on one side only and the tree can root in the opposite direction. It is not appropriate to rely on the reduced RPA where potential disturbance extends halfway or more around the tree.

Typically the structural rootplate of a tree to resist windthrow is much smaller than the RPA. Therefore tree stability should not be affected by disturbance up to RPA boundary.

5.4.2 Specific Rootzone Impacts:-

- Some of new parking spaces 8-11 lie within RPAs of cypresses G10. However, rooting from T13 (to be removed) will have occupied some of this space. Minimal-dig required: see 6.9 below.

- Spaces 12-14 are within RPA of H11 and beech T4. Remove both.

5.5 Shading.

5.5.1 General:-

The sun rises to 60^0 at mid-day in mid-Summer when trees are in leaf (ratio of 16m vertical height to 10m horizontal distance).

The sun only rises to 12^0 in mid-Winter. However, in winter deciduous trees are leafless, so shading is reduced.

Theoretical shadows of arcs equal to estimated tree height in ten-years' time are shown in Appendix II for potentially shade-casting better trees only, as recommended in BS5837. *This is the shadow pattern for a period from May to September inclusive, from 10.00hrs to 18.00hrs daily.*

5.5.2 Specific Shading Impacts:-

- Beech T4 already shades the existing property, and together with H11 will shade the new extension. Remove both.
- Sycamore, ash & cherry T1-T3 will cast afternoon shade onto the new extension. Crown lifting and trimming back is required.

5.6 Over-bearing and Falling material.

5.6.1 General:-

All trees drop flower parts, leaves, twigs and fruits throughout the year. These can block gutters. Bird droppings and honeydew can spoil car paintwork. Big trees make adjacent dwellers nervous.

5.6.2 Specific Impacts:-

- T1-T4 and H11 will all shed material and over-bear the new extension. T4 has other problems so remove it with H11. Prune back T1-T3.

5.7 Subsidence/heave & root growth.

5.7.1 The geology map suggests underlying fine-textured subsoil which may not be shrinkable.

5.7.2 If so, there should be issues of tree roots causing shrinkage or swelling of the ground, and under foundations. Engineer to design foundations to NHBC Chapter 4.2 (2013) or similar.

5.8 Amenity value.

5.8.1 General:-

Public amenity can be affected by development, particularly loss of visual amenity (landscape value) and loss of wildlife habitat.

5.8.2 Specific amenity Impacts:-

- No loss from removal of Leylandii H11.
- Removal of beech T4 and T13 will open out centre of this congested site. There will be improvement to internal landscape value.
- Minimal change in external views form removing trees at the centre of the site.

6. Arboricultural Method Statement in sequential order for proposed development at Branksome Care Home site.

6.1 Supervision

6.1.1 Trees cannot be protected unless the developer is committed to their protection.

A site meeting **before work starts** between Council Tree Officer, site manager/architect, retained arboriculturalist / landscape architect may be required to agree locations, and feasibility, of tree protection fencing and tree retention. This can be conditioned as part of a planning permission.

6.1.2 The local authority may require follow-up inspections to check temporary ground protection, and when minimal dig drive parking is made: because impacts on retained trees could be significant with careless groundworks.

6.2 Tree Management

This should be done in two operations, before and after construction:-

6.2.1 Tree Work prior to ground work:-

- Initial tree **removal** required for the development, tree pruning **to allow access,** and work to provide **medium-term separation,** is listed in the work schedule below.
- Work is listed to coincide with BS5837 constraints Stage 1, then additional work for Stage 2: development.

No	Species	RPA radius m.	Tree work: ignoring development.	Tree work: *for proposed development* & landscaping.
T1	Sycamore	6.5		*Crown lift to 5m above ground on north-eastern side, and trim back north-eastern side by maximum 1.5m.*
T2	Ash	6.3	Crown lift removing 5 bottom limbs, above roof.	*Crown lift to 5m above ground on north-eastern side, and trim back north-eastern side by maximum 1.5m.*
T3	Flowering cherry	3.2		*Trim back upper part of canopy to north east by 2m.*
T4	Beech	11.2	Remove completely, or attempt to re-balance by 4m off all parts of main stems to north and east. 3m off north and east sides.	*Remove.*
T5	Lawson cypress	4.6		*Crown lift to 3m clearance above ground.*
T6	Spruce		Fell.	Same.

T7	**Lawson cypress**	**3.9**		
T8	**Holly**	**3.2**		
T9	**Camperdown elm**	**4.4**		
G10	**Lawson cypress golden**	**5.4**		
H11	**Leyland cypress**	**3.0**	**Top at 8m @ approx. 1/2 height, and shape in upper sides.**	***Remove all.***
T12	**Hawthorn**	**3.4**	**Crown lift east side.**	**Same.**
T13	**Copper Beech**	**5.7**	**Remove all of horizontal limbs to west. General crown clean to leave a narrower crown.**	***Remove.***
T14	**Hornbeam**	**2.5**	**Pollard at 6m, below top of yew.**	**Same.**
T15	**Beech**		**Fell.**	**Same.**
T16	**Ash**		**Fell and treat stump. Also coppice all nearby cherry laurel overhanging roadside wall.**	**Same.**
G17	**Japanese knotweed**		**Foliar spray Glyphosate June & September each year x 5 years 'til gone.**	**Same.**
T18	**Sycamore**		**Fell ASAP.**	**Same.**
G19	**Japanese knotweed**		**Foliar spray Glyphosate June & September each year x 5 years 'til gone.**	**Same.**
T20 No paint	**Wych elm**	**4.8**	**Fell ASAP.**	**Same.**
T21	**Small dead elms**		**Fell all ASAP.**	**Same.**

End of table.

6.2.2 Treework informatives:-

6.2.2.1 Disturbance to wildlife.

It is essential to check for nesting birds, bat roosts, badgers and hibernating animals such as hedgehogs under trees, before pruning or removing trees, as negligent disturbance is an offence under the EC Habitat Directive 1992 and CROW Act 2000. The Habitat Regulations were amended in August 2007 to include as an offence ***any*** damage or destruction of a breeding site or resting place of European Protected species: mainly bats in a tree context.

In general, autumn tree work: **September, October and November** is least disruptive to bats and birds.

6.2.2.2 Permission

Trees may be protected by a TPO, and could lie within a Conservation Area.
Trees may be owned by third-parties.
Trees may be protected by planning conditions.
Therefore, a contractor must satisfy himself that all necessary permissions from the local planning authority or tree owners are in place before touching trees.

6.2.2.3 Quality of Tree Work

All off-ground tree work should be done by insured tree surgeon with certificates in aerial chainsaw use (new designations:- NPTC 020-04, 0020-05, 0020-07, 0021-01, 0021-07; LANTRA 600/5703/8, 600/5717/8, 600/5715/5, 600/5704/X, 600/5714/2), and working to BS3998:2010.
(Stumps can be left to shoot again, ground out, or grubbed out, depending on location.)

Treework following construction (see 6.10 below…...)

6.3 Tree Protection

6.3.1 Requirement

The most important tree-protection measure is effective protective fencing, erected as close as possible to the Root Protection Area (RPA) boundary before any other work starts on site including demolition in the vicinity of trees.
It must be maintained until all work is completed, except final soft landscaping.
Here tree protection is proposed for retained trees, and for areas of proposed new planting where this is feasible: called landscape zones.

6.3.2 Vertical Tree Protection

6.3.2.1 Tree Protection fencing **locations** are shown on Tree Protection Plan in Appendix V.

6.3.2.2 A general **specification** for suitable protective fencing is given in Appendix VI.

6.3.2.3 Within the fenced off **CEZ** Construction Exclusion Zone there must be:-

- no construction access,
- no storage of materials, including soil,
- no ground disturbance.

6.3.2.4 Fencing to remain until all demolition, construction and hard landscaping work is completed, and removed only for final soft landscaping.

6.3.3 Temporary Ground Protection (TGP) within RPAs:-

6.3.3.1 IF work is required to be closer than the all-round protection zone, then the fenced off zone can be made smaller on that side, or entered temporarily, subject to permission from retained arboriculturalist.
Within such zones, temporary horizontal ground protection plus temporary fencing would be essential. **On this site TGP is needed to allow construction access past T1-T3. Examples below:-**

6.3.3.2 Three obvious options for ground protection would be:-

- Temporary ground protection plates such as aluminium "Eve Trakway" or plastic interlocking-plate ground protection, both on 150mm depth of woodchip or bark, shown in Appendix VII.
- A layer of woven geo-textile under minimum 250mm depth of graded aggregate which is lifted after work.
- Butted scaffold boards or 22mm plyboard laid on bearers on 150mm depth woodchip or bark mulch (pedestrian only).

6.4 Construction Access.

6.4.1 **The site is constrained.**

6.4.2 General points:-

- No plant or machinery to enter RPAs without ground protection.

6.4.2 Site huts could be placed within RPA of trees and hedges; provided they are on stilt feet, no excavation is required for temporary services, and pedestrian and vehicle access is ground protected as detailed in 6.3.3 above.

6.5 Demolition within RPAs:-

6.5.1 To demolish existing building and areas for new parking:-

- Stand digger & dumper as far from trees as possible.
- Carefully lift and drag material RADIALLY away from trees to minimise interference with roots and branches.

6.6 Foundations within RPAs:-

6.6.1 No special foundations required to protect tree rootzones.

6.6.2 (Engineer to design foundations to protect from tree root activity.)

6.7 Drainage.

6.7.1 Storm-water drainage: Any soak-away system must be designed so that it does not add to, or decrease, ground water in trees' rooting zones. Existing system should be used wherever possible to minimise change in trees' rootzones.

6.7.2 Foul Drainage: Keep away from trees.

6.7.3 Sustainable Urban Drainage System: If a SUDS scheme is implemented to reduce the load on local main drainage, it must not add to the soil water in trees' root zones. There is space under the drive and parking area for underground storage and soakaways.

6.8 Service Trenches.

6.8.1 Service trenches (electric lights, utilities, telecoms, drains etc) must be **designed** to run as far from trees as possible.

6.8.2 Trenches within RPA of ANY retained trees **should be avoided,** because they require this onerous, generalised, work method:-

- Hand digging* or trench-less systems must be used.
  *Use an air-spade to reveal roots (Appendix VIII).
- Retain roots >15mm diameter within service trenches. Thread service pipe underneath.
- No roots >25mm diameter must be exposed or severed without express written permission of local authority tree officer or retained arboriculturalist.
- Any excavation within the RPA of a tree must be covered immediately after digging with damp hessian, topped by tarpaulin & plyboard, to prevent root desiccation.
- Hole must be backfilled within five days of opening.
- Wrap exposed roots >20mm with hessian, and surround by 50mm depth sand, as part of backfill medium.
- Tamp backfill material by hand thumper or whacker plate only.

6.8.3 Additionally, tree protection required during the planning and execution of service trenching is detailed in NJUG Volume 4 and BS5837.

6.9 Minimal-dig construction for new access drives, parking & paths

6.9.1 If roads, footpaths, cycle-ways, yards or parking are required near trees, they can be constructed in two ways:-

Conventional construction:- If outside a tree's RPA.
Minimal-dig construction:- If within a tree's RPA.

6.9.2 **Minimal dig construction is required for parking bays 8-11, See areas hatched on Tree Retention & Protection Plan.**

6.9.3 Sequence of work for parking bays 8-11:-

- Use small digger to smooth ground, lifting off paving etc and removing only 50mm depth soil.
- Sever any roots as they are found, neatly with lopper or hand saw.
- Lay 300g/m2 geotextile separation layer.
- Install treated timber edge boarding no deeper than 50mm, projecting above ground to proposed final depth of parking bays (250mm?), secured to 50x50mm treated pegs driven in at 0.5m centres.
- Construct parking conventionally to required depth with aggregate (type-1 or similar).
- Gently compact.
- Surface with fine compacted chippings (avoid asphalt which might crack if roots are present underneath).
- Make up outer edges with topsoil and seed.

6.9.4 If larger areas of substantial hard surfacing is required nearer to trees, Appendix VIII shows examples of cellular ground reinforcement (Cellweb etc) to create strong but thin and porous pavements, to be used in case heavier-duty road work is needed close to retained trees. It should not be needed on this site.

6.10 Tree work following construction

6.10.1 Trees should be re-inspected. This inspection would reveal the need for remedial tree work for the following reasons:-
-to rectify damage occurring during construction (regrettable but

possible),
-to allow additional clearance,
-or complete tree removal if trees were considered too close for safe retention.

6.10.2 All additional work subject to further local authority agreement if trees are protected by TPO or planning conditions, or stand within a Conservation Area.

6.11 New Landscaping

6.11.1 The site contains many trees. No more are essential.

6.11.2 Additional planting of hedges, shrubs and small trees would be desirable to thicken the woodland area either side of the river, to replace dense rhododendron & laurel. However, more planting is not essential as part of this proposal: we do recommend planting from time-to-time to give a varied age range to the tree cover on a property: particularly a large site as here. BS8545:2014 advises.

7.0 Conclusions

7.1 Proposed extension at The Branksome Care Home requires the removal of two significant trees only.

7.2 Retained and off-site trees can be protected by careful construction methods.

7.3 New planting is not needed as part of the development, but we always advocate planting as part of on-going property maintenance.

If client or local authority have any further queries please do not hesitate to contact us.

Yours sincerely,

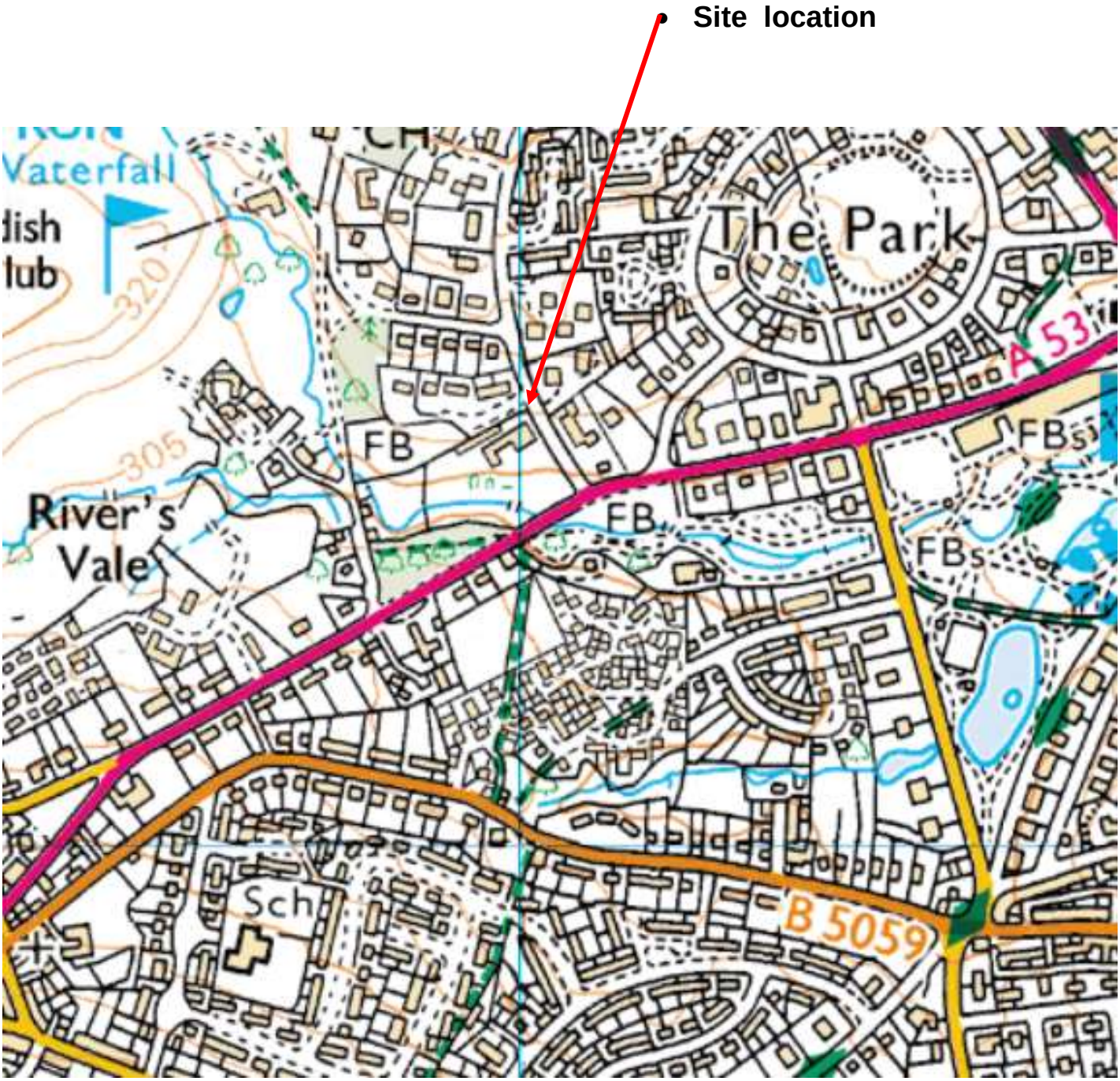
Jim Unwin

B. J. Unwin Forestry Consultancy

References:

"The Body Language of Trees". Claus Mattheck and Helge Breloer. HMSO 1994.
"Principles of Tree Hazard Assessment and Management". David Lonsdale. HMSO 1999.
BS 3998: 2010 "*British Standard Recommendations for Treework*".
BS 5837: 2012 *"Trees in Relation to Design, Demolition & Construction"*.
BS 8545:2014 "*Trees: from nursery to independence in the landscape. Recommendations*"
NJUG Volume 4: 2007 "*Guidelines for the Planning, Installation and Maintenance of Utility Services in Proximity to Trees"*.
NJUG, 30 Millbank, London, SW1P 4RD.
"Trees and Development". Nelda Matheny and James R Clark. ISA. 1998.
BS 8206:1992 "*Lighting for buildings*" .
BRE guide 209 (2002) "*Site Layout planning for daylight and sunlight*" .
NHBC Chapter 4.2, *Building Near Trees*. National House Building Council, 2013.
"Tree Roots in the Built Environment". J Roberts, N Jackson & M Smith. R.A.T.8, TSO (The Stationary Office, London, 2006.

Appendix I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Aerial photo Taken spring mid-morning.

Appendix II

Constraints plans :-

- **Tree Plan**

***Retention categories*, based on BS 5837 Table 1:-**

A = *High quality & Value (>40yrs life)*: Green.

B = *Moderate quality & Value (>20yrs life)*: Blue.

****C = *Low quality & Value (>10yrs life)*: Grey.**

U = *Trees to be removed (<10yrs life)*: Red.

****PLEASE NOTE. FOR CLARITY, C-CATEGORY TREES MAY NOT BE COLOURED.**

- **Root Protection Areas Plan**

RPA = circles.
See Tree Table for dimensions.

and

- **Theoretical Shading Plan**

= quadrant of shading caused by tree height in ten years' time from north west (mid-morning) to due east (evening).
This is a shadow pattern for 1 x tree height from 10.00-18.00hrs from May to September.

Separate plans are not included in pdf format of report.

Insert plans here in paper copy of report:-

8 x Photos:- Appendix III

P1: View north into entrance.

P2: View south east down drive.

P3: **View east to base of beech T4. One of several exposed roots marked.**

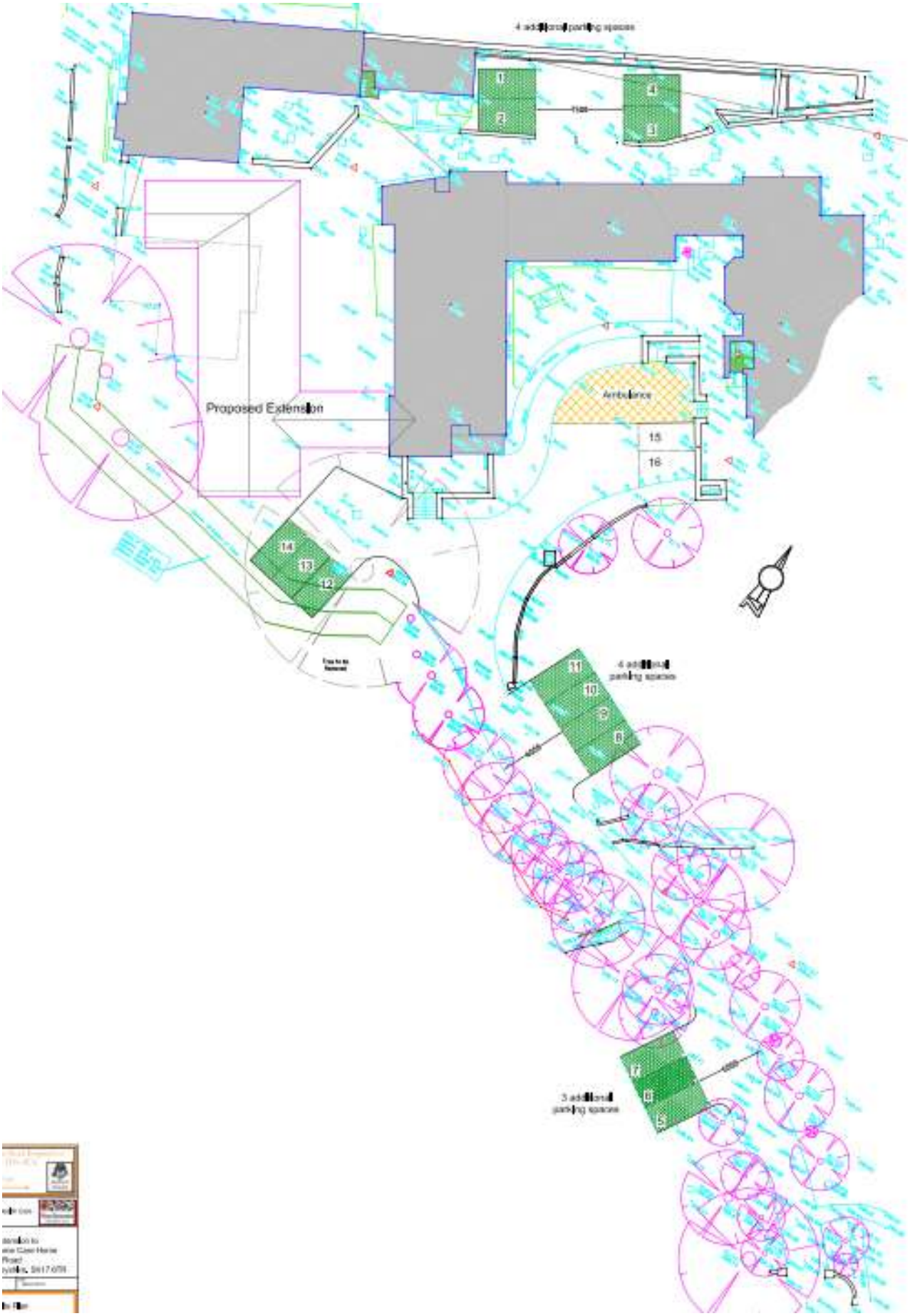
P4: **View south west to beech T4 right and other avenue trees T5-8 on its left.**

P5: View south east to sycamore T1 & ash T2 centre. Hawthorn T12 on right.

P6: View south west along rear boundary wall.

Appendix IV

Proposed draft development 04/04/2014 Rev.A.



Appendix V

Tree retention and Tree Protection Plan

Plan insert here.

Separate plan not included in pdf format of report.

Appendix VI

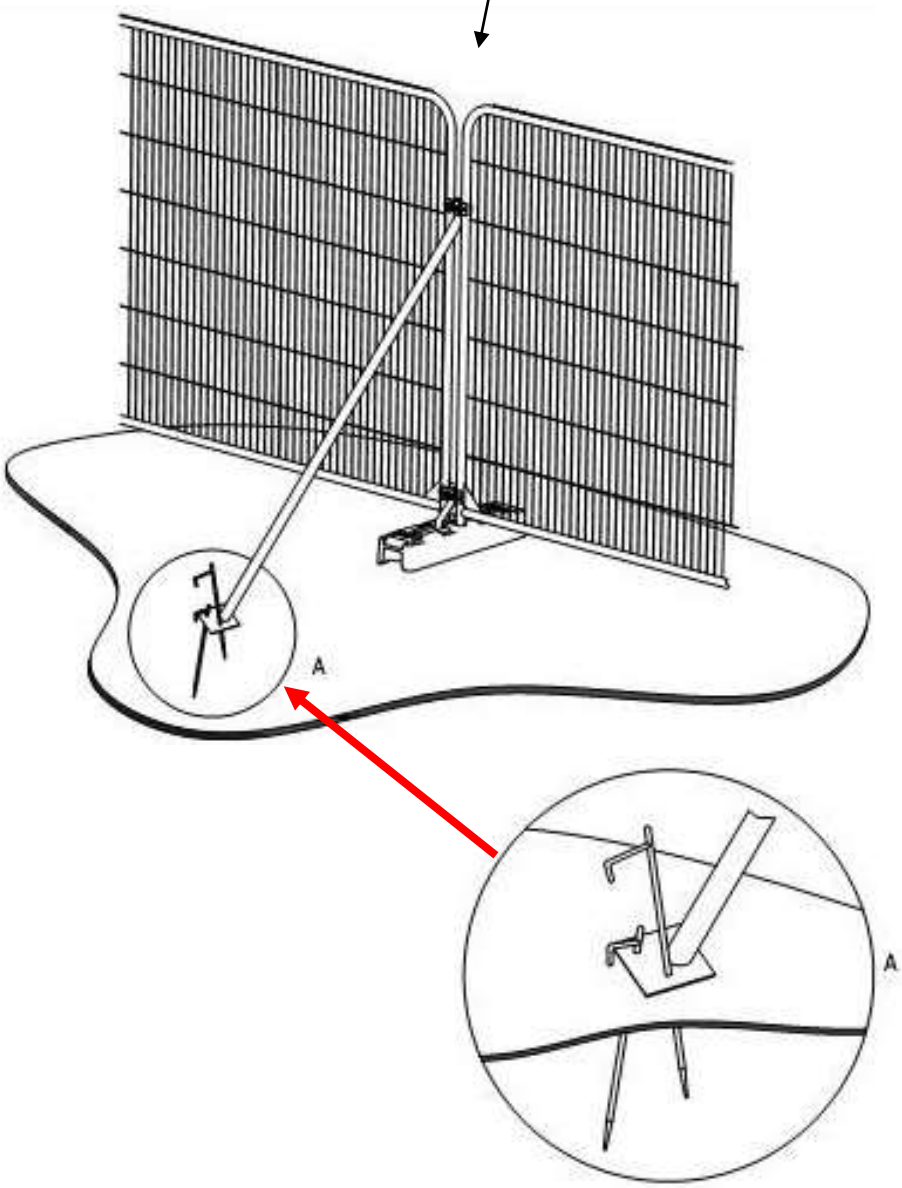
Vertical Tree Protection Fencing, from BS5837.

Heras panels on rubber feet, pinned braces.

Vertical protective fence: location on plan:

Apply signs at 20m spacing:

TREE PROTECTION - Construction Exclusion Zone. NO ACCESS



Appendix VII

Horizontal Ground Protection x 2 examples

Example of aluminium temporary ground protection.

EVE TRAKWAY

Roadways - Medium Duty Trakpanel

The Medium Duty Trakpanel, or 'Box' panel, is ideal for where both pedestrian and vehicle access is required. This versatile panel can be laid with either a smooth or corrugated surface uppermost. The smoother surface finish provides excellent support underfoot, whilst the construction of the panel maintains a high load bearing capacity. Due to the way these panels fit together, a smooth joint is created therefore reducing trip hazards.

The Benefits
Pedestrian friendly upper surface
Suitable for heavy vehicles
Ideal for where both pedestrians and vehicles require safe passage

Technical Specifications	
Dimensions	**2.5 x 3m (when installed 2.44m x 3m due to overlap)**
Weight	**274.7 kg**
Carrying Capacity	**A more pedestrian friendly roadway, this system is capable of taking any road going loads.**

The following Roadways are available. Please select an item to view more information:

Other Roadways products
- Heavy Duty Trakpanel
- LD20
- Roadway Ramps
- Multi-Directional Trakpanel

Example of plastic temporary ground protection.

Appendix VIII

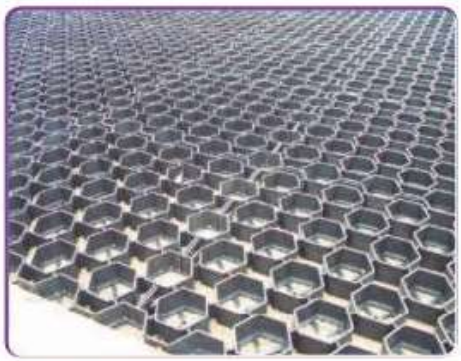
Shallow trays for strengthening gravelled or grassed areas.

GRB Plus

GRB Plus is a new and revolutionary development in ground stabilisation and reinforcement.

Introduction:

Manufactured in the UK from 100% recycled material directed from landfill, GRB Plus is the environmental and sustainable solution to prevent ground erosion. The honeycomb design provides an interlocking system that can be laid at ground level, filled with stone, gravel or soil and then seeded.
GRB Plus creates maintenance-free areas without detracting from the scenary, qualities that make it perfect for green car parks and construction projects.



Specification:

Grid Area	500 x 500 x 40mm
Wall Thickness	4mm
Wall Depth	40mm
Weight/m^2	4.56kg/m^2
Number of tiles per m^2	4
Load Capacity	Up to 250 tonnes/m^2
Material	100% Recycled UV Stable Polyolefin

Application:

- Construction sites
- Green parking areas
- Access roads & Private lanes
- Pathways & drives
- Golf courses
- Landscaping projects
- Equestrian & livestock facilities
- Green roof & roof top gardens
- Towpaths
- River & road embankment
- Embankment stabilisation
- Emergency access routes
- Helicopter landing pads
- Cycle routes
- Private Airfields

Green-tech Ltd.
Sweethills Park. Nun Monkton. York. YO26 8ET
Tel: 01423 332 100. Fax: 01423 332 101. Email: sales@green-tech.co.uk. Web: www.green-tech.co.uk

Slightly deeper (50mm or 80mm trays for strengthening gravelled or grassed areas.

DuoBlock

Grass Protection System



Using grass or gravel infill, DuoBlock 750 and 500 give architects, consulting engineers, landscape contractors and developers the ultimate in load-bearing performance combined with aesthetic appearance.

Porous paving systems have been available since the early 1990's and provide a durable yet aesthetically pleasing alternative to traditional surfacing solutions. Increased awareness of the need to manage storm water runoff in new developments and the advent of Sustainable Urban Drainage Systems (SUDS) has led to an increase in popularity.

DuoBlock is a permanent grass protection / gravel retention porous paving system. It is extremely versatile and may be used in a wide range of applications including:

Applications:

- Overspill car parking
- Emergency access and service roads
- Caravan hardstanding
- Verge hardening
- Service Roads
- Pedestrian walkways and towpaths
- Bridle ways
- Helipads
- Golf course pathways / Tee reinforcement

DuoBlock systems are uniquely designed to ensure the ultimate in load bearing performance and aesthetic appearance and have numerous benefits over traditional and first generation plastic systems such as:

Benefits:

- 90% surface area available for infill
- Reduces surface water runoff
- Increases water Filtration
- Interconnecting cell walls
- High Load Performance
- Unique surface design for greater aesthetic appeal
- Positive interlock System

NEXT DAY DELIVERY from stock

Deeper Cellweb 3-D grid for strengthening tracks.

Access road for the National Lake District Parks Authority.

Site before construction pictured above.

CellWeb during installation.

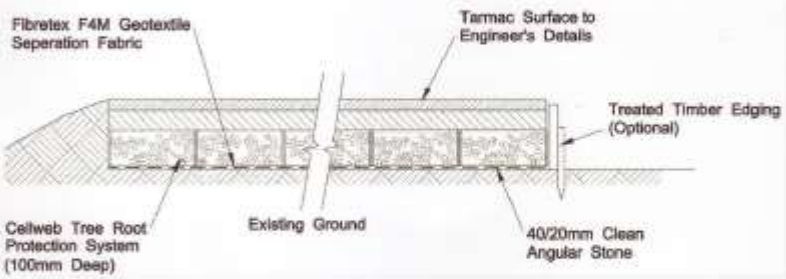
Final surfacing.

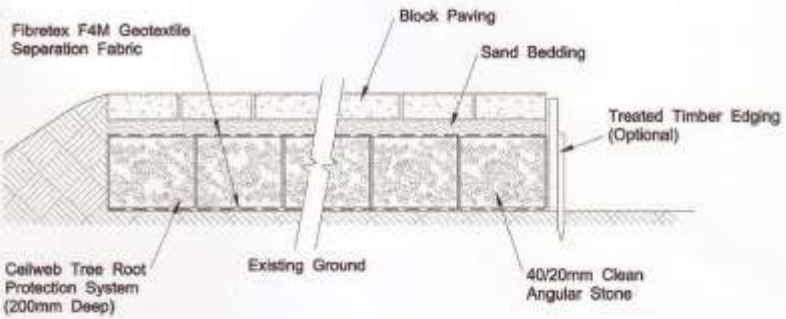
Final surfacing

The CellWeb Tree Root Protection is totally confined within the clean stone sub base, therefore you can choose whichever surface materials are most appropriate for your installation. Some materials are more suitable than others and serious consideration should be given to the porosity of the surface for continued healthy growth of the tree. An ideal surfacing are DuoBlocks: a grass reinforcement and gravel retention system. Geosynthetics can supply these systems for a visually attractive surface that also has the advantage of being fully porous.

Loose or bonded gravels can be used as an alternative hard landscaping and CellWeb can also be used with block paviors whose porous joints will permit moisture and air transfer to the roots. Where planning allows, porous asphalt is yet another possible surfacing treatment.

Call our sales office on 0870 850 1018 for more information.





Appendix IX

Example of Air-spade.

HANDLE VIBRATION TEST

Product type – MBW Soil Pick SP125

Manufacturer of testing apparatus – Castle

Accelerometer was affixed to the rear of the handle on the Soil Pick and all three axes were tested.

Accelerometer position:
X axis = 0.0M/S2
Y axis = 0.0M/S2
Z axis = 0.0M/S2

Hand/arm vibration = 0.0M/S2

TREE CARE

MBW's Soil Pick provides a multi-functional air tool for a variety of applications in the tree care industry including:

Radial Trenching
Radial trenching is a process which involves aerating the soils around a tree root in a pattern resembling a wagon wheel. The Soil Pick provides a safe and damage free means of utilizing a high air pressure to loosen tightly compacted soils.

Aeration & Excavation

Root Locating for Utility Line Installation or Pruning

Investigating Root Structure and Damage

Transplanting or Bare Rooting

Reducing Soil Compaction

Appendix X

B J UNWIN FORESTRY CONSULTANCY,

Head office: **Parsonage Farm, Longdon, Tewkesbury, Gloucestershire. GL20 6BD.**
Tel / Fax: 01684 833538. Home Tel: 01684 833795. Mob: 07860376527. E-mail: Jim@bjunwin.co.uk
Associate office: **1 Market Place Mews, Henley-on-Thames, Oxfordshire, RG9 2AH.**

Principal: **Jim Unwin BScFor, MICFor, FArborA, AARC, CEnv.**
Chartered Forester,
ICF Registered Consultant,
Fellow of the Arboricultural Association,
Arboricultural Association Registered Consultant
Chartered Environmentalist.

From:	**Jim Unwin**	*To:*	**Prospective Client**
Date:	**Jan 2014**	*No. of pages:*	**2**
Subject:	**Professional CV**		

Below are set out **B J Unwin Forestry Consultancy**'s competences and experience.

Insurance:-

£5m Public Liability & **£2m Professional Indemnity** **(renewed June)**.

Personnel:-

B J Unwin (born 1956) started his forestry career as a tree surgeon and landscape contractor in 1975. He studied forestry at Aberdeen University from 1977 to 1981, worked for Unilever as a Forestry Manager in the Solomon Islands from 1981 to 1983. Since then he has been based in Gloucestershire assisting clients to manage their woodland, trees and vegetation throughout Southern Britain, and occasionally in northern England, Scotland and Northern Ireland. He works as a tree consultant / manager / contract manager to a range of clients listed below.

He works with two self-employed Level-3 arboriculturalists of 35 combined years' experience:-

Jasper Fulford-Dobson Professional Member of the Arboricultural Association - Associate Member of the Institute of Chartered Foresters - Professional member of the International Society of Arboriculture - Technicians Certificate (ArborA) 2005, now regarded as NQF "level 4" - Professional Tree Inspection Certificate (LANTRA) 2013, &

David Shephard BSc Rural Environmental Science - AA Tech Cert AA PTI - Professional Tree Inspection Certificate (LANTRA) 2013) and Arb Assoc Approved Contractor.

plus a secretary/technician; calling in extra help as required (eg ecologist or arboricultural assistant. On bigger projects he regularly works as a part of a multi-disciplinary team.

Current BJUFC qualifications are:-

BSc Forestry Hons 1st Class, Aberdeen 1981.

Chartered Forester, 1986.

Fellow of the Arboricultural Association, 1995.

Licensed Subsidence Risk Assessor, 1997-2001 (scheme closed in 2001).

Completed Training in September 2002 to Prepare Native Woodland Plans for CCW and FC in Wales.

Arboricultural Association Registered Consultant, 2004.

LANTRA certificate for Arboriculture and Bats, BJU in 2005.

Examined and approved to submit Welsh WGS as Management Planner and PAWS Assessor, 2006.

Joined Utilities Vendor DataBase, Supplier No: 88101 in Feb 2006 (left 2010).

Training and Certification in basic CAD operation 2006.

Chartered Environmentalist April 2008.

Woodfuel Production and Supply : LANTRA Certificate of Training Dec 2008.

Training in CAVAT amenity tree asset valuation October 2010.

SPA Quarry Safety Passport, current: BJU & JF-D.

Company Safety Policy:- We have been successfully assessed by SMAS as meeting CDM Regs Core Criteria Stage 1, as a ***Worksafe Consultant No. 25341.*** Dated 24/06/2013 expiry 09/07/2014.

First-aid at work June 2013.

Current clients and typical work include:-

English Heritage	Tree safety inspection contract 2007-2013 for East Midlands, East Anglia, London and SE England. Tree safety inspection contract for West of England & Midlands 2013-2019.
Amey Mouchel Ltd	Overseeing Amey Tree Officer on motorway and trunkroad tree inspections throughout Midlands and Marches. Amey Mouchel are agents for Highways Agency.
Tarmac Ltd, Midland Quarry Products & Quarryplan (in Northern Ireland).	Since 1990 working with Estates staff, quarry managers and Landscape / ecological consultancies organising and managing contracts for tree and woodland planting both pre- and post- quarrying. Also preparing landscape restoration schemes for straightforward sites plus landscape management on sites throughout southern England, East Anglia and south and south-west Wales. (Commendations for Land Restoration and Environmental improvements from Spelthorne Borough Council 2003.) Also in Northern Ireland ongoing tree consultancy for Quarryplan.
English Heritage	Appointed Tree Inspector for all EH sites in SE England, London, Eastern England and East Anglia, for five years from April 2007.
Bruton Knowles	Assisting BK clients with woodland management and other tree issues since 1984.
Tarmac Central Ltd	Since 1988 woodland management of Hopwas Hays Wood, Tamworth.
Planning Inspectorate (**PINS**) & Dept for Communities and Local Government.	**Arboricultural Inspecting Officer** in South-West England, South East England, West Midlands and East Midlands; advising the First Secretary of State on TPO appeals since 2000. Contract with DCLG expired April 2008. Contract continues with PINS, as **Arboricultural Decision Officer**.
Rural estates in Herefordshire, Worcestershire and Gloucestershire, plus private woodland owners in southern England and Wales.	Since 1983 woodland management, tree management, hedgerow management. Many are Ancient woodlands and SSSI's requiring detailed ecological management plans produced in consultation with ecologists. About forty Farm Woodland Premium Schemes and about twenty Native Woodland Plans prepared to date in England and Wales. On-going EWGS grant applications. Input into Tir Gofal (and its successor) and Stewardship schemes. Better Woods for Wales (BWW) applications.
British Waterways	Ten-year Tree and Vegetation Management Plans along canals and around reservoirs in London, Hertfordshire, Berkshire, Birmingham, Staffordshire, Worcestershire, Gloucestershire, Shropshire, Llangollen Canal, etc: plus help in dispute with riparian owners. This work is ongoing over the past twenty years.
Stroud District Council	Management of 49Ha woodland since 1989 on FC schemes plus grassland on DEFRA Stewardship Schemes, including HLS. Retired Nov07.
One–off clients	Since 1983 assisting tree owners, developers, lawyers etc throughout southern or midland Britain, including Wales, on a wide range of tree-related issues including planning, planning appeals, subsidence, health & safety, disputes, vegetation control, expert witness, valuation of woodlands, standing and felled timber, Christmas trees etc, and tree and landscape planting schemes. Recently High Hedge issues and BS5837 are hot topics.
Architects / Developers / Planning Appeals	Complete Arboricultural Impact Assessments on simple sites: and working with other professionals to input arboriculture into more complex development schemes. Recent assignments from Liverpool to Wiltshire, Kent and Norfolk, London. All using BS5837:2012. FULL CAD CAPABILITY.
Malvern Hills District Council. South Oxfordshire District Council	BJU Stand-in part-time Consultant Tree Officer Summer 2003. JF-D stand in Consultant Tree Officer summer 2009 to spring 2010.
Golf course & leisure facilities	Assistance with development of Carden Park golf course in Cheshire. Management of trees on other golf courses: Eg Ross Golf Club, Swindon Golf Club .

Please do not hesitate to ask for further information. B J Unwin END.