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Ref: **29th June 2020** - BJU/mmi

To: Mr Dan Stannard,
 7, Dryland Houses,
 The Meadway, Tilehurst,
 Reading, RG30 4PJ.
<mailto:danstannard81@hotmail.co.uk>

co: Jamie Flatman, Eastcourt Consulting.
[Jamie Flatman <Jamie@eastcourtconsulting.co.uk>](mailto:Jamie@eastcourtconsulting.co.uk)

Dear Mr Stannard,

No.8 Riley Rd., Tilehurst, RG30 4UX, - BS5837 Tree Constraints, tree impact assessment, and tree protection method statement for residential re-development.

Contents:

Fig 1: BS5837 Design & construction process & tree care.	1. Instruction.
2. Inspection.	3. The Site.
4. The Trees.	5. Proposed Development & Tree Impacts.
4.1 Trees on site:	5.1 The proposal.
4.2 Off-site trees:-	5.2 Tree Constraints and Impacts (considered below).
4.3 Amenity:	5.3 Physical contact of above-ground parts of trees.
4.4 Photos:	5.4 Below-ground root spread.
4.5 Tree Descriptions & Tree Constraints Table.	5.5 Light Interception & Shading.
	5.6 Over-bearing and Falling material.
	5.7 Subsidence/heave & root growth.
	5.8 Amenity impact.
6. Arboricultural Method Statement in sequential order for proposed development.	7. Conclusions.
6.1 Supervision	Appendices 1 to VIII:-
6.2 Tree Management	I Location & Google Earth aerial.
6.3 Tree Protection	II Vertical Tree Protection Fencing, from BS5837
6.4 Construction Access.	III Horizontal Ground Protection x 2 examples
6.5 Demolition / Excavation within RPAs:-	IV Shallow trays for strengthening gravelled or grassed areas.
6.6 Foundations within RPAs:-	Slightly deeper (50mm or 80mm trays for strengthening
6.7 Drainage.	gravelled or grassed areas.
6.8 Service Trenches within RPAs.	Deeper Cellweb 3-D grid for strengthening tracks.
6.9 Minimal-dig construction for new access	V Example of Air-spade.
Drives, parking & paths	VI B J UNWIN FORESTRY CONSULTANCY CV.
6.10 Tree work following construction.	VII Constraints plan:- Tree Crowns Root, Protection Areas,
6.11 New Planting.	Theoretical Shading.
	VIII Tree retention and Tree Protection Plan.

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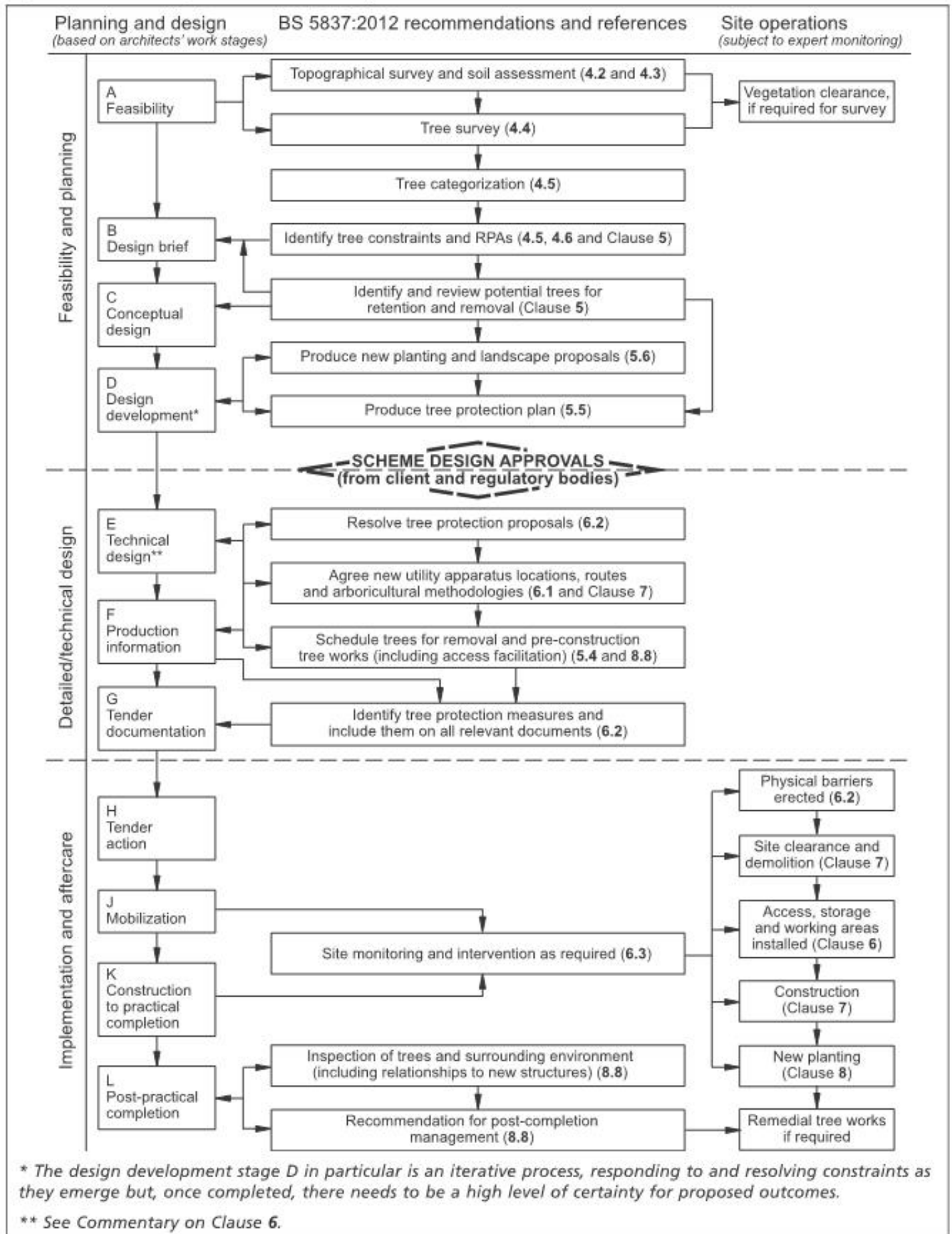
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Figure 1 The design and construction process and tree care



1. Instruction.

- 1.1 Mr Stannard wishes to re-develop the corner plot of No.8. Jamie Flatman has asked B J Unwin Forestry Consultancy to advise on trees for planning application purposes, subject to quote.
- 1.2 The local authority (Reading Borough Council) require a tree impact assessment and tree protection method statement for any proposal. The local authority may require mitigation by new planting for any trees lost as part of any development.
- 1.3 For the tree survey we have used a **Topo Survey by 360Geomatics 360G/1903T/100 of June 2019**. We have updated to show current fence locations and removed vegetation. **Jl Architects' Re-development Proposal Rev B of 26/3/20**, extract in section 5, shows the proposal, and guides our tree impacts sections 5 and tree protection section 6 of this report.
- 1.4 Therefore methodology of the report below follows *BS5837:2012 Trees in Relation to Design, Demolition & Construction*.
- 1.5 BS5837 flowchart previous page. Appendices follow signature page.

2. Inspection.

- 2.1 Jim Unwin met the client, and made an un-accompanied site survey on 23rd June 2020.
- 2.2 The survey was from ground level, involving visual observation (Visual Tree Assessment: Mattheck and Breloer, 1994 and Lonsdale, 1999). We measured dbh, (estimated for off-site and inaccessible trees) and measured or estimated crown spread and height.
- 2.3 The report for this project is by Jim Unwin who has > 40 years' experience working with trees (professional-CV attached).

3. The Site.

- 3.1 The site of the tree survey is a residential corner plot and its surroundings about 70m x 60m.
- 3.2 The site is elevated on a slight plateau, with a slight fall to the south east from 90.5m to 89m aod. The site is not exposed to wind.
- 3.3 Geology from BGS website:
Superficial deposits: Winter Hill Gravel - Sand and gravel. Sedimentary superficial deposit formed between 480 and 423 thousand years ago during the Quaternary period.
Bedrock geology: London Clay Formation - Clay, silt and sand. Sedimentary bedrock formed between 56 and 47.8 million years ago during the Palaeogene period.
Therefore, natural subsoils and upper geology are likely to be coarse-textured, with no volume-change potential.
- 3.4 To the west is quiet Riley Road. To the north is quiet Delaney Close. To the east is Lousehill Copse local nature reserve woodland dropping to the east, and to the south is an other residential plot.

4. The Trees.

4.1 Trees on site:-

- An overgrown privet hedge H10 lines the rear garden's southern boundary. It could be trimmed down and shaped.

4.2 Off-site trees:-

- The verges of Riley Road contain old ornamentals including Japanese flowering cherries and a purple plum T13. All have short remaining lives.
- Lousehill Copse to the east is predominantly oak woodland with an understorey of hawthorn.
- But the section 20m east of No.8's rear boundary is open ground with some 2020 planting of transplants in spiral guards, open hawthorn and plum, and one small self-sown Norway maple.

4.3 Amenity: This could describe an attractive tree, a screening function, habitat potential, or historic/veteran tree.

- The old street trees provide interest along Riley Road, but do need replacing soon.
- Lousehill Copse and associated woodland extends north and south for almost 2km, to provide a linear habitat, cut by only two roads.
- We have not checked for TPOs, but the only vegetation on site, the privet hedge, is unlikely to be protected.

4.4 Photos below:



4.4.1 View south to No.8. Cherries T11 & T14 to right. Lousehill Copse rear left.



4.4.2 View north east along Riley Road to purple plum T13 foreground. Off-site shrubs SG15 behind white van.



4.4.3 View east along Delaney Close to Lousehill Copse. Plums G9 in centre.



4.4.4 View north outside rear fence. Note gap with a few new trees. Oak trees are set well back on the right.



4.4.5 View south east along overgrown privet H10 to woodland set well back beyond.

4.4.6 Base of oak T2 with *Ganoderma applanatum* decay fungus bracket.



4.5 Detailed Tree Descriptions

4.5.1 Trees on, or potentially influencing the site, are individually described in the table below, and shown on the plans in Appendices.

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 starting to decline in health (but may still have years of safe life).
- Vet: Veteran: usually very old; of significant historic, habitat or cultural value.

Health & Structural condition:-

Self-explanatory:- **Good, Fair, Poor or Dead.**

Remaining Safe Useful Life

Prediction of safe 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 4.5, are:-

Retain:

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

Light Green*

Mid Blue*

Grey*

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:-

- 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 = $12 \times \text{stem diameter at 1.5m ht.}$

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).

4.5.2 8 Riley Road - BS5837 Inspection - BJUFC – 23rd June 2020

No. T=tree S=shrub H=hedge G=group	Species	Dbh (stem diam @ 1.5m ht) mm.	Total height. Ht to base of crown. Est Ht in 10 yrs. m.			Crown radii m.				Age class	Health	Structural Condition	SULE	Comment (All are in average to good health and condition, unless stated otherwise.)	Retention category A (best) to C. U = (remove) Sub-category 1, 2 or 3	BS 5837 Root Protection Area Radius. m.	Recommended WORK excluding development.
						N	E	S	W								
T1	Oak	860	22	7	22	8	8	1	5	M	F	F	>40	Good, woodland-edge tree.	A1/A2	10.3	
T2	Oak	600	14	5	15	5	0	11	4	M	F	P	20+	Very suppressed by T1. Lopsided. <i>Ganoderma applanatum</i> decay fungus bracket at base.	C3 Habitat	7.2	
T3	Oak	850	20	6	20	9	5	5	9	M	F	F	>40	Good woodland-edge tree.	A1/A2	10.2	
T4	Hawthorn	330	8.5	3	8.5	2	2	4	2.5	M	F	F	20+	Ivy. Understorey tree.	C2/C3	4.0	
T5	Hawthorn	240	7	1.5	7	3	0	0.5	2	M	F	P/ F	20+	Ivy. Understorey tree.	C2/C3	2.9	

T6	Hawthorn	90, 180, 200	7	3	7	3	0	1	2	M	P	P	10	Dieback. Understorey tree.	C2/C3	3.4	
T7	Norway maple	100	9.5	1	12	1	1	2	2	Y	F	F	>40	Squirrel damage (which will be repeated).	C1	1.2	
WG8	Oak and hawthorn	100- 1000	5-25	1-8	5-25	0-11	0-11	0-11	0-11 ext.	M	P- F	P- F	10- >40	Lousehill Copse: Local Nature Reserve. Self-sown mature oak in clumps, with ivy-covered hawthorn understorey. Occasional ash, elm, lime, plum etc.	A2/A3	12.0	
G9	Wild plum x 4	150	7	1	8	4.5	2	0	2 ext.	Em	F	P/ F	10- 20	Growing north over post and rail fence.	C2	1.8	
H10	Privet	150 basal	4.5	0	2	1-2	1	1	1	M	F	F	20+	Good hedge, but needs trimming down and re-shaping.	C2	1.5	Trim annually to 'A'-shaped profile at 2m height.
T11	Flowering cherry	370	4.5	2.2	4.5	2	1.5	2	1.25	Lm	P	P	<5	Old street tree. 50% dieback. Heavily crown reduced.	C2/U	4.4	
T12	Flowering cherry	350	5	2	5	4	2	1	2	Lm	F	P/ F	10	Old street tree. Heavily pruned.	C2	4.2	

T13	Purple plum	250	8	1.8	8	2.5	2.5	1.5	2	Lm	P/ F	P/ F	10	Street tree. Dieback.	C2	3.0	
T14	Flowering cherry	460	7	2.5	7	4	3	3.5	4	Lm	F	P	10	Old street tree. Exposed roots. Crown reduced.	C2	5.5	
SG15	Mixed shrubs	150	2.5	0	2.5	0.8	0.8	0.8	0.8	Em / M	F	F	20+	Off-site trimmed big boundary hedge. Holly, viburnum, and Olearia.	C2	1.8	Trim as individuals.

End of table.

5. Proposed Development & Tree Impacts.

5.1 The proposal.

- 5.1.1 The proposal, JI Architects' Re-development Proposal Rev B of 26/3/20, extract below, shows the proposal. Tree retention is historic.
- 5.1.2 The house is replaced by four new houses facing Delaney Close.
- 5.1.3 Two new accesses are made off Delaney Close.



5.2 Tree Constraints and Impacts (considered below).

- 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 amenity value.

- 5.2.2 Trees are listed in table, and coloured on the Tree Plans, 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 Plans in Appendices shows tree locations and crown spreads. Crown dimensions: spread in four directions, base of crown and tree height, are given in Table 4.5.2.

5.3.2 Specific above-ground impacts:-

- A shared path behind plot 1 may replace the north-western 8m of privet T10.

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 some disturbance within the RPA.

5.4.2 Specific Rootzone Impacts:-

- No impacts.
- The amount of theoretical RPA from T11 extending under the verge, asphalt footway, under the frontage wall, and into the front parking area of No.8 is negligible.

5.5 Light Interception & Shading.

5.5.1 General:-

The sun rises to 60° 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° 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 is 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:-

- The oak trees in the woodland are set at least 35m south east from plot 4 house.
- Therefore, there are no shading impacts.

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 create a mulch layer on roads. Bird droppings and honeydew can spoil car paintwork. Big trees make adjacent dwellers nervous.

5.6.2 Specific Impacts:-

- None.

5.7 Subsidence/heave & root growth.

5.7.1 To be assessed by an engineer referring to NHBC 4.2:2020.

Subsoil and geology suggest non-shrinkable geology.

5.7.2 If so, no trees pose a subsidence or heave risk.

5.8 Amenity impact.

5.8.1 Amenity can be *visual landscape, habitat or heritage/historic*.

- The proposal requires possible removal of 8m of hedge.
- Landscape impact on trees, shrubs and hedges is minimal. .

6. Arboricultural Method Statement in sequential order for proposed development at Riley Road site.

6.1 Supervision

6.1.1 We would recommend the following arb inspections:-

- **Pre-start site meeting** between architect, building / groundwork contractor, Council Tree/Landscape Officer, and retained arboriculturalist to agree feasibility of tree retention, tree protection and working methods.
- **No more needed.**

6.1.3 All inspections to be followed within three working days with emailed supervision log with action points and photos, copied to client and tree/landscape officer.

6.2 Tree Management

6.2.1 Tree Work prior to ground work:-

Table overleaf.....

6.2.2 Treework informatives, included for general information:-

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 Habitats Directive 92/43/EEC, Countryside and Rights of Way Act 2000, Protection of Badgers Act 1992. The Conservation (Natural Habitats, & C) (Amendment) Regulations 2007 make **any** damage or destruction of a breeding site or resting place of a European Protected species (mainly bats in a tree context) an offence.

In general, autumn tree work: **September, October and November** is least disruptive to bats and birds. Work on very ivy-clad trees may need a formal pre-start bat assessment by a trained bat worker.

6.2.2.2 Permission

Trees may be protected by a TPO, or 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.

A Felling Licence may be needed to clear non-domestic areas.

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 and working to BS3998:2010, and "*Treework at Height*", the Arboricultural Association's ICoP.

(Stumps can be left to shoot again, ground out, or grubbed out, or poisoned, depending on location.)

6.2.3 Treework for Riley Rd. development:-

No	Species	RPA radius m.	Work for landscape / tree health.	<u>ADDITIONAL WORK FOR DEVELOPMENT</u>	
				<u>Specification.</u>	<u>Reason for additional work for development.</u>
T1	Oak	10.3			
T2	Oak	7.2			
T3	Oak	10.2			
T4	Hawthorn	4.0			
T5	Hawthorn	2.9			
T6	Hawthorn	3.4			
T7	Norway maple	1.2			
WG8	Oak and hawthorn	12.0			
G9	Wild plum x 4	1.8			
H10	Privet	1.5	Trim annually to 'A'-shaped profile at 2m height.	<u>Remove western 8m, for new path.</u>	
T11	Flowering cherry	4.4			
T12	Flowering cherry	4.2			
T13	Purple plum	3.0			
T14	Flowering cherry	5.5			
SG15	Mixed shrubs	1.8	Trim as individuals.		

End of table.

(Treework following development 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 possible new planting where this is feasible: called **landscape protection zones**.

6.3.2 Vertical Tree Protection

- 6.3.2.1 Tree Protection fencing **locations** are shown on Tree Protection Plan in Appendices.
- 6.3.2.2 Two **specifications** for suitable protective fencing are given in Appendix II. **Lightweight fencing will suffice here. Or use existing rear-boundary fence.**
- 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.
TGP is not needed on current modest proposals.
- 6.3.3.2 Obvious options for temporary 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 III.
 - 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 access only).

6.4 Construction Access.

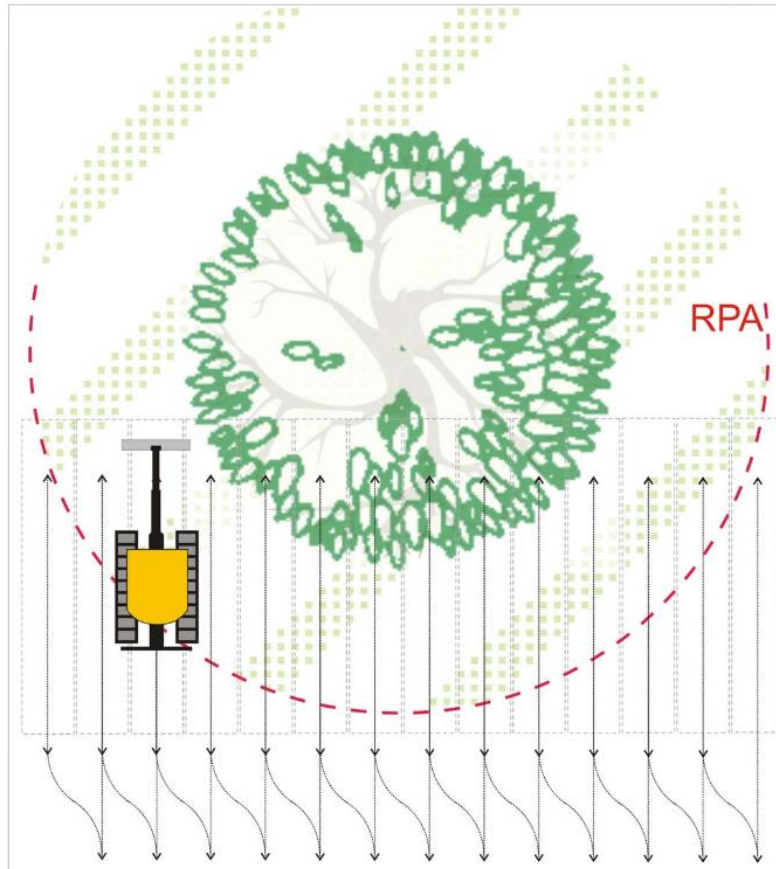
6.4.1 General points:-

- Access is good.
 - No vehicle, plant or machinery to enter RPAs without temporary ground protection as detailed in para 6.3.3 above.
- 6.4.2 Site huts could be placed within RPA of trees and hedges (eg T11); provided they stand elevated 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 / Excavation within RPAs:-

6.5.1 General specification FOR EXCAVATION, may not be required here near:-

- Parallel tracking with slewing outside the RPA Sketch plan below .
- 1.5-tonne rubber-tracked mini-digger with toothless grading bucket.
- Scrape off only turf or top layer to 100mm depth.
- Slew outside RPA.
- Heap spoil outside RPA, for dumper to collect and run outside RPA.



6.6 Foundations within RPAs:-

No special measures needed.

6.7 Drainage.

6.7.1 The site has a slight fall to south east.

Storm-water drainage: Any soak-away system must be designed to avoid significant increase and no decrease of ground water in trees' rooting zones. Divert into soakaways outside RPAs, or store for greywater recycling.

6.7.2 Foul Drainage: Keep out of RPAs. Use existing.

6.7.3 Sustainable Urban Drainage System: Any SUDS scheme, to reduce the load on local mains drainage, must not significantly add to, or reduce, the soil water in trees' root zones. Store for greywater re-use, or allow percolation into garden areas.

6.8 Service Trenches within RPAs.

- 6.8.1 Service trenches (electric lights, utilities, telecoms, drains etc) must be **designed** to run as far from trees as possible. **Use existing runs wherever possible.**
- 6.8.2 We are not aware of a need for new services. But trenches **within RPAs must be avoided.**
- 6.8.3 Otherwise use this onerous, generalised, work method:-
- Hand digging* or trench-less systems must be used.
*Use an air-spade to reveal roots (Appendix V).
 - 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.

6.9 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 No special measures needed.
- 6.9.3 Appendix IV gives materials for minimal-dig, porous, build-up, but not needed with current proposal.

6.10 Tree work following construction.

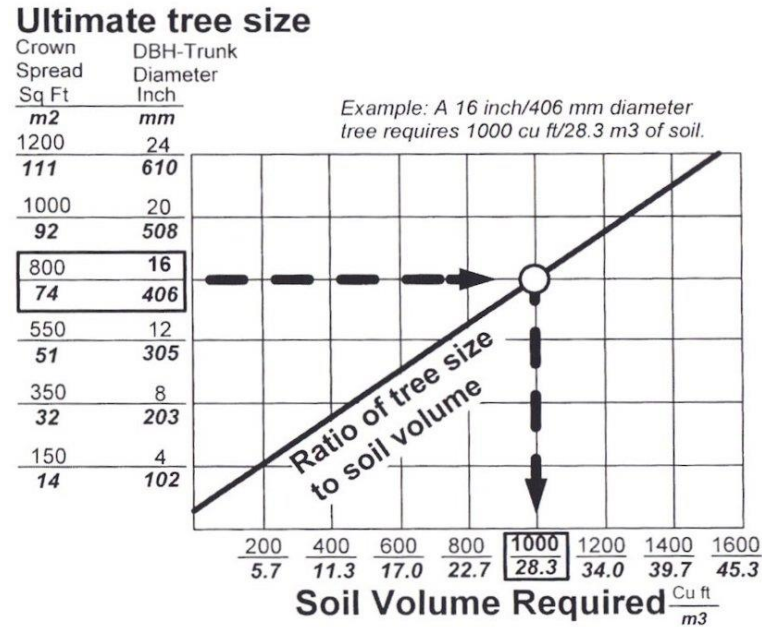
- 6.10.1 Trees should be re-inspected. This inspection would reveal the need for remedial tree work for the following reasons:-
-to rectify damage occurring during construction (regrettable but possible),
-to allow additional clearance.
-or complete tree removal if trees were considered too close for 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 Planting.

- 6.11.1 The site contains no trees. New planting will be needed to provide garden landscape and screening, as shown indicatively on architect's plan.
- 6.11.2 Any planting and maintenance to comply with: **BS 8545 "Trees: from nursery to independence in the landscape – Recommendations". BSI 2014.**

- 6.11.3 Any planting must be provides with adequate long-term soil-moisture availability: graph below from James Urban shows rootable area related to tree size (Up by Roots, ISA, 2008), to remind designers:

Table 2.4.1. Tree size to soil volume relationships (*Urban 1992*).



7.0 Conclusions

- 7.1 The proposed re-developments at No.8 Riley Road require no tree removal or pruning, and only removal of 8m of privet hedge.
- 7.2 Trees and shrubs and hedges can be protected by careful construction detailed in section 6 of this report: mainly protection fencing.
- 7.3 Tree and shrub planting is required as part of this proposal.

Please contact us for further information.
Yours sincerely,

Jim Unwin

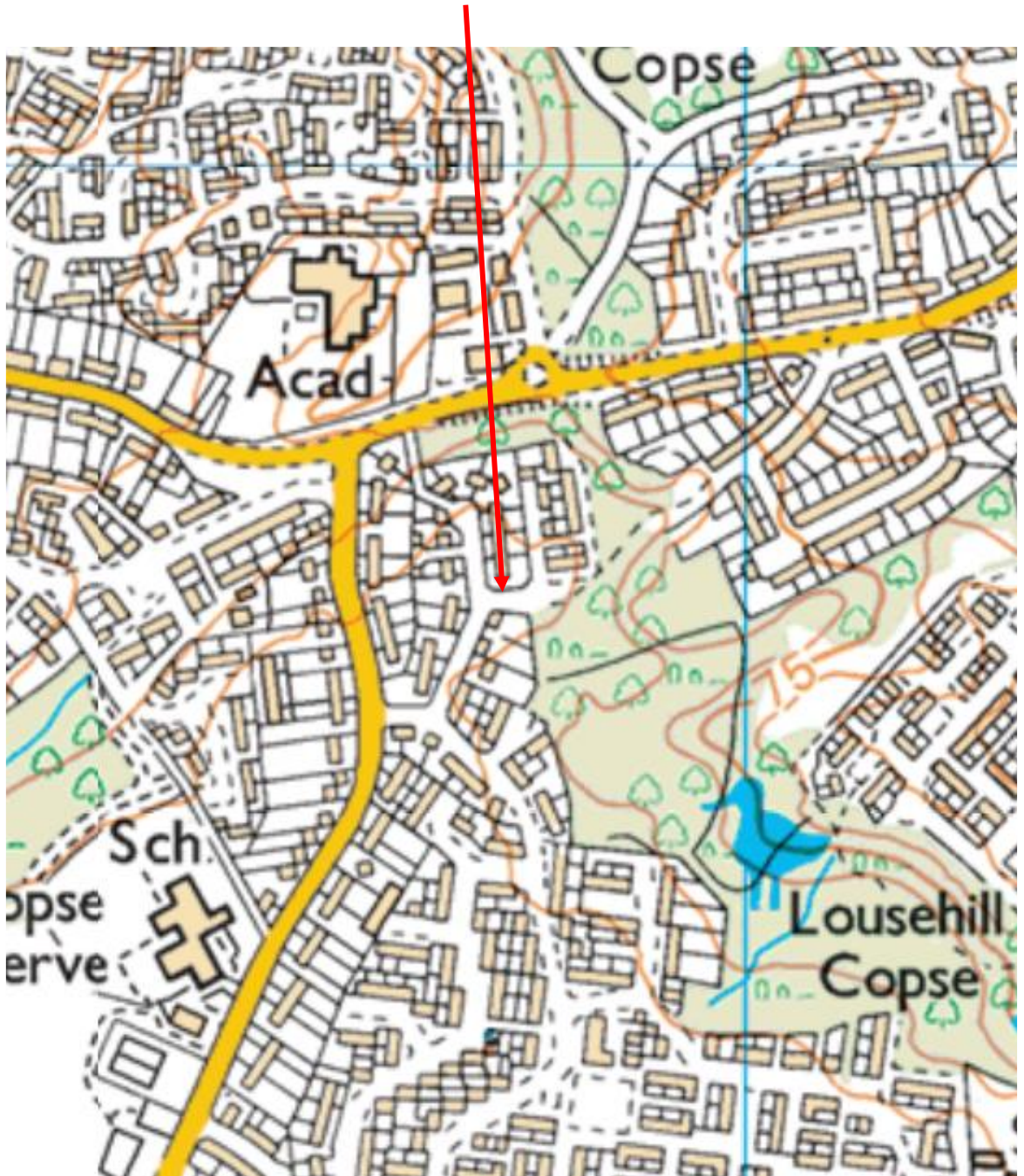
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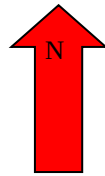
References:

- "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 *"Trees: from nursery to independence in the landscape – Recommendations"*. BSI 2014.
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.
"Treework at Height" Industry Code of Practice. Arboricultural Association. 2014.

Appendix I

Location





Google Earth aerial.
Taken July 2019. Trees and hedge removed since.



Appendix II

Vertical Tree Protection Fencing, from BS5837.

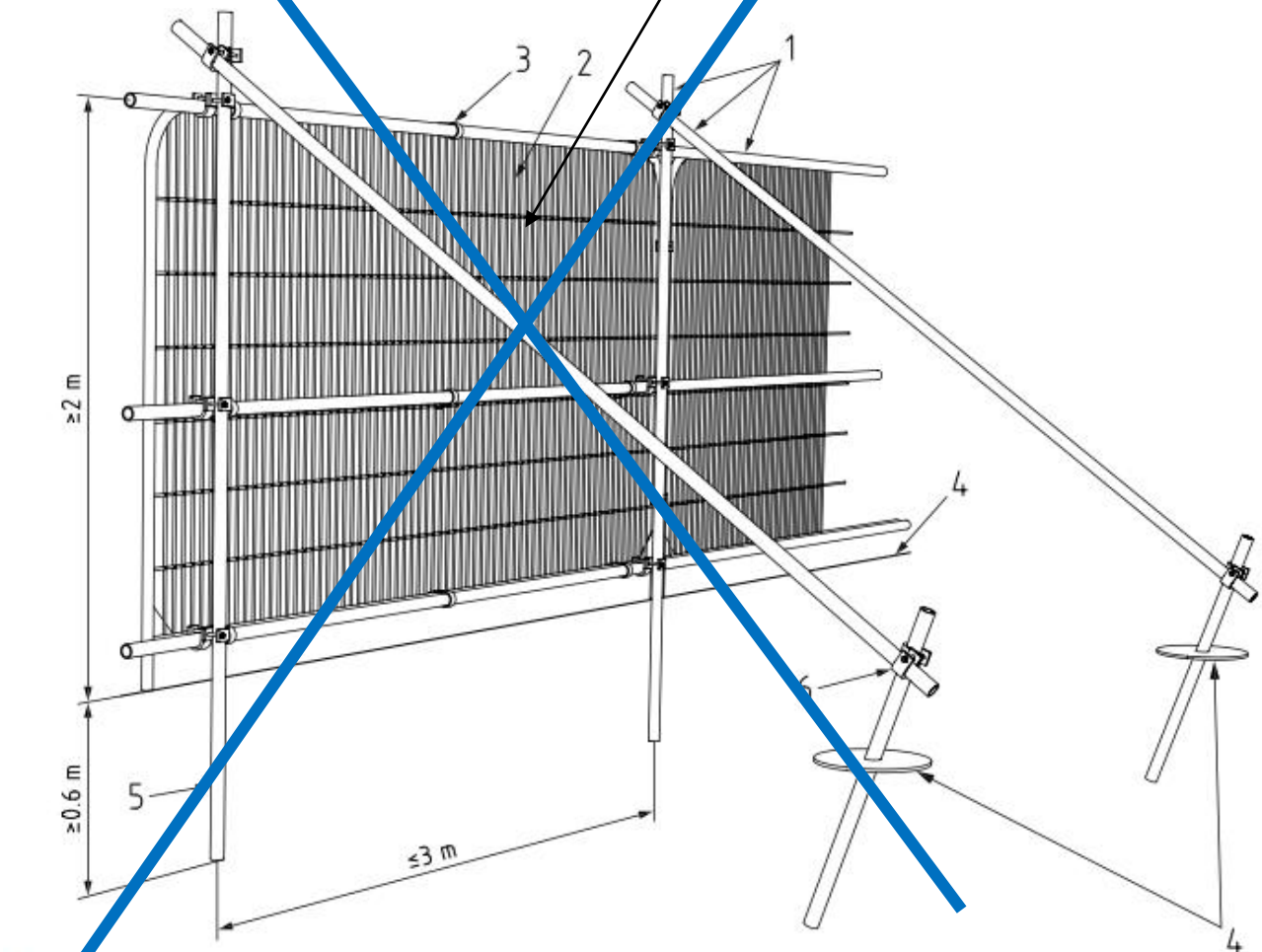
Heras panels on rubber feet, pinned braces.

Vertical protective fence: location on plan:

Default in situ > 3 months:-

Apply signs at MAX 10m spacing:

**TREE PROTECTION -
Construction Exclusion
Zone.
NO ACCESS**



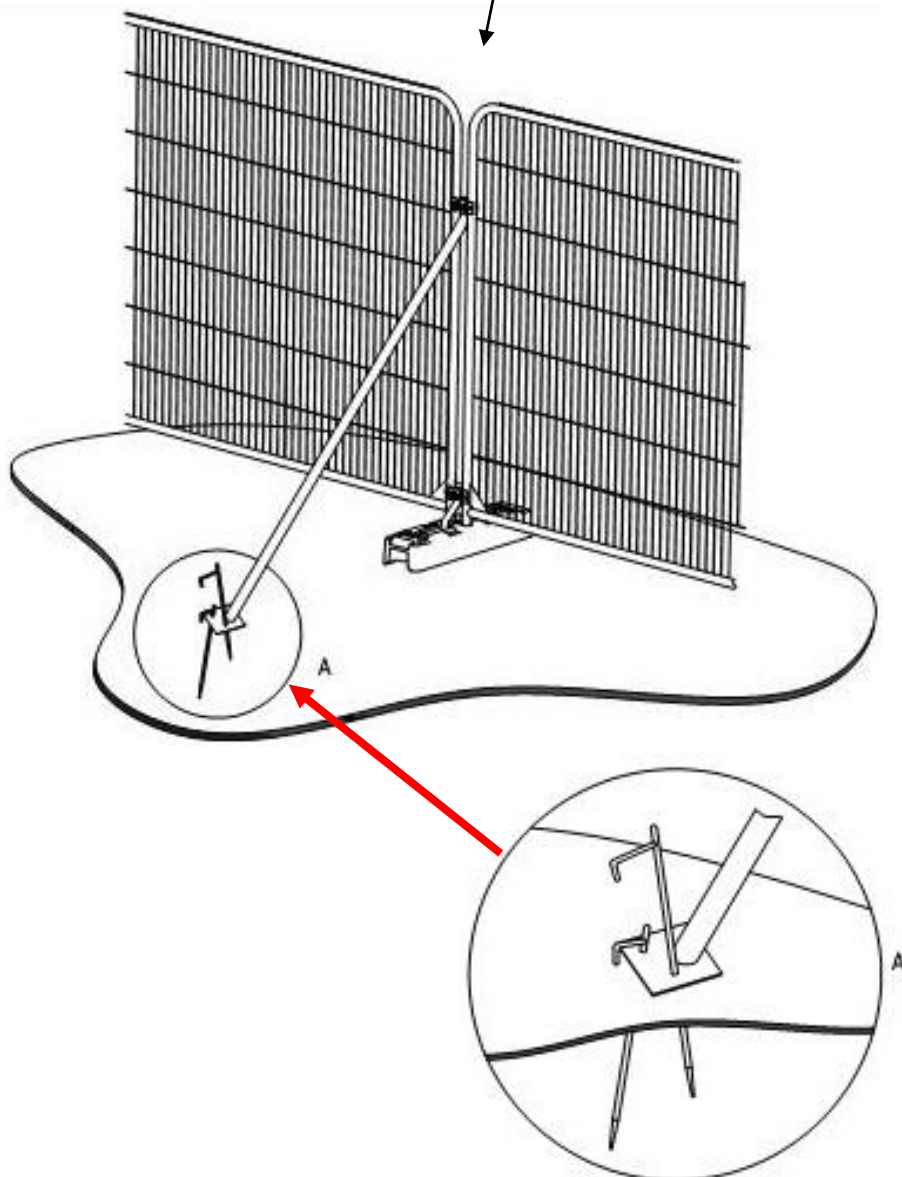
Key

- 1 Standard scaffold poles
- 2 Heavy gauge 2 m tall galvanized tube and welded mesh infill panels
- 3 Panels secured to uprights and cross-members with wire ties
- 4 Ground level
- 5 Uprights driven into the ground until secure (minimum depth 0.6 m)
- 6 Standard scaffold clamps

Lightweight: in situ for < 3 months-

Apply signs at maxm 20m spacing:

**TREE PROTECTION -
Construction Exclusion
Zone.
NO ACCESS**



Appendix III

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.

Ground-Guards Tree Root Protection

Tree root protection for construction projects

Planning Departments may often need to stipulate that site access roads will not involve any excavation because of the proximity of tree roots on the site. Furthermore, that they will also provide additional ground cushioning when passing over the immediate areas where there are tree roots beneath. This is very important to prevent compaction of the ground, and long-term damage to the soil structure, the tree roots, and ultimately, to the health of the trees themselves.

An effective means of protecting tree roots is to use a double layer of Ground-Guards. Panels with 150mm of wood chips sandwiched in-between which creates a suitably cushioned roadway for this purpose.

The Ground-Guards system is so durable and versatile that whatever your need, the team will be delighted to work with you to provide an effective solution. Please just call our team on 0113 267 6000 for friendly advice on any difficult site conditions that you need assistance with.



Appendix IV

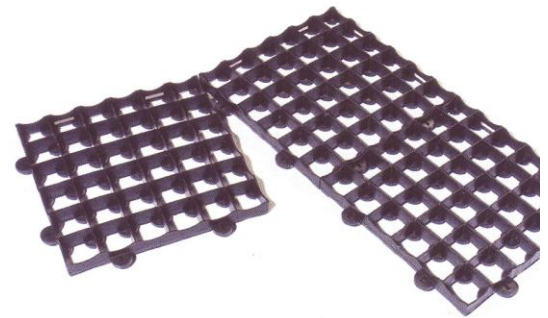
Trays for strengthening gravelled or grassed areas. (50mm or 80mm trays for strengthening gravelled or grassed areas.

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:

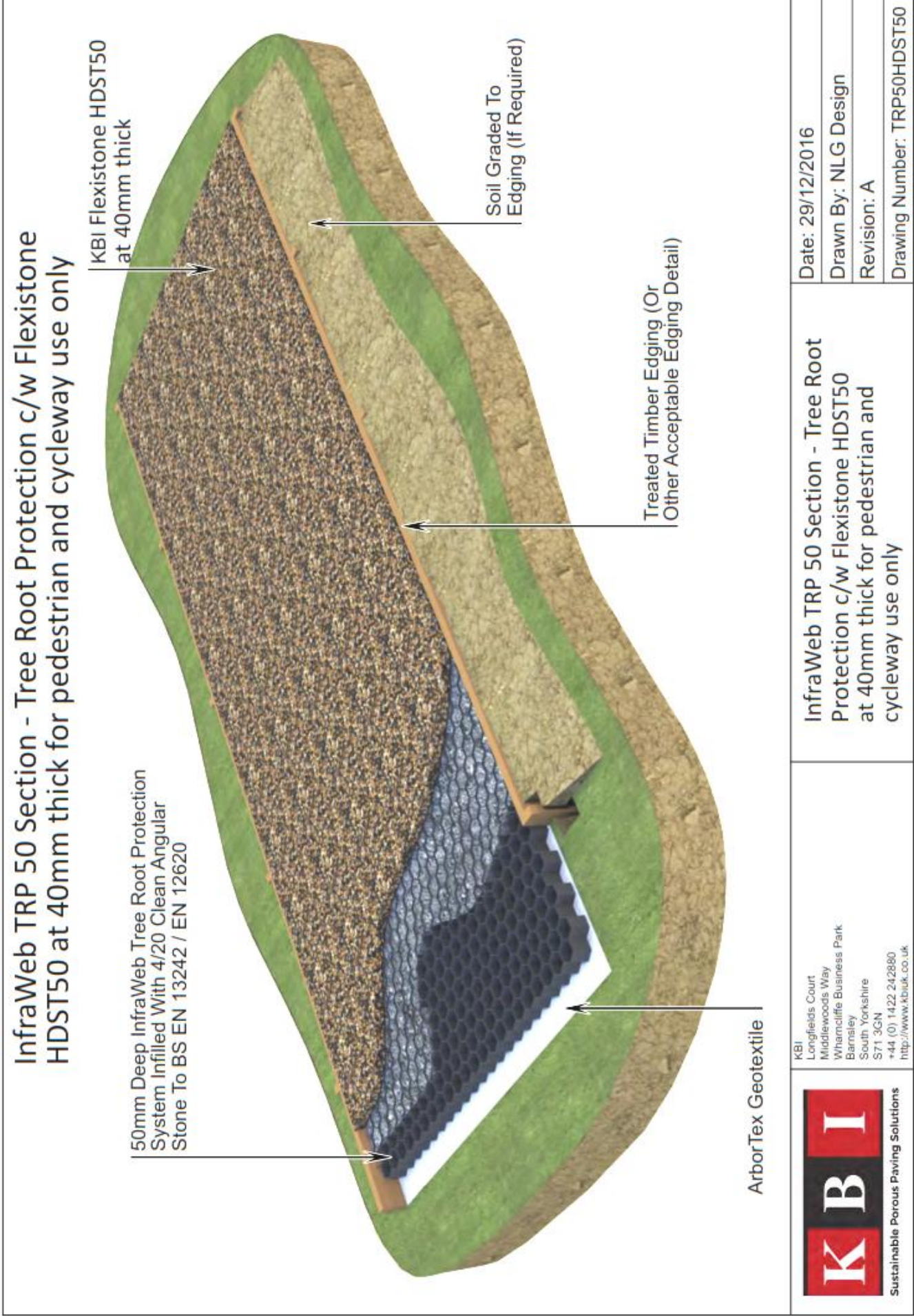
- Overspill car parking
- Emergency access and service roads
- Caravan hardstanding
- Verge hardening
- Service Roads
- Pedestrian walkways and towpaths
- Bridle ways
- Helipads
- Golf course pathways / Tee reinforcement

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.

Cellweb® TRP is a 3D cellular confinement tree root protection system. The system provides a 'no dig' solution for the construction of new hard surfaces within root protection areas (RPAs). Cellweb® TRP has been designed and independently tested to comply with recommendations made in Arboricultural Practice Note 12 and BS 5837 2012 – Trees in relation to design, demolition and construction.



Cellweb® TRP Key Functions

Cellweb® is a 'no dig' solution which is constructed directly on the existing ground surface. This eliminates the requirement for excavation, preventing root severance.

Cellweb® is a completely porous system allowing continued water permeation and gas exchange between the rooting environment and atmosphere.

Cellweb® spreads point loads, minimising increases in soil compaction within the rooting environment. This maintains an open graded soil structure allowing continued root growth, water, gas and nutrient migration.

The Cellweb® TRP system comprises the following three components

Treetex™ Geotextile. Following minimal ground preparation the Treetex™ is laid onto the existing ground and top soil. This acts as a separation layer, separating the system above from the soil and rooting environment below. Treetex™ performs as a hydrocarbon pollution control measure in accordance with BS5837, holding 1.7lt of oil per square meter.

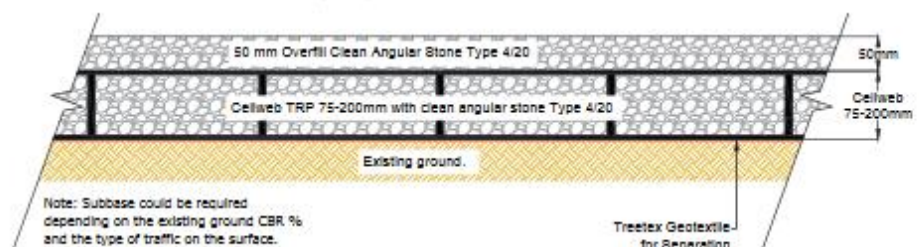
Cellweb® 3D Cellular Confinement. The Cellweb® is installed on top of the Treetex™ layer. This is fixed to the ground using ten steel J pins per panel. The panels can be cut to the required shape and adjoining panels can be connected using heavy duty staples or cell ties.

4-20mm Clean Angular Stone. The expanded Cellweb® is infilled with a 4-20mm clean angular stone. The confined angular stone locks together to produce a rigid stone mattress, while maintaining air pockets for continued water permeation and gas exchange. The low fines content of the stone prevents the Treetex™ layer from becoming blocked over time.

Which depth of Cellweb® TRP?

The Cellweb® System is provided in four different depths; 200mm, 150mm, 100mm and 75mm. The depth required is determined by the proposed traffic loadings and the site ground conditions. Geosynthetics in house engineering department can provide a free site specific technical recommendation. For free technical and engineering support please contact Geosynthetics Ltd 01455 617139 or the full installation guide can be found on our website www.geosyn.co.uk.

Indicative Cellweb with overfill



Web: www.geosyn.co.uk | Tel: 01455 617139
Fax: 01455 617140 | Email: Sales@geosyn.co.uk



Geosynthetics
Engineered Solutions

Appendix V

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.

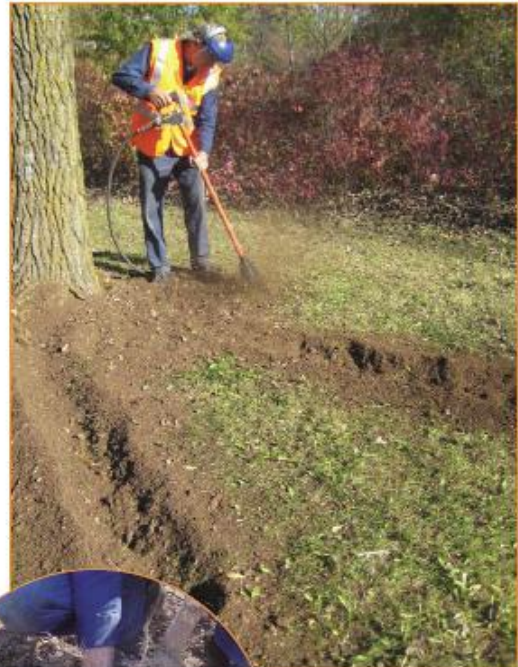
Aeration & Excavation

Root Locating for Utility Line Installation or Pruning

Investigating Root Structure and Damage

Transplanting or Bare Rooting

Reducing Soil Compaction



Appendix VI

- 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

Satellite Offices: - Haley Ridge, Highcliffe, **Nr. Wadebridge, Cornwall**, PL27 6TN.

-105 Charfield Court, 2 Shirland Road, **London**, W9 2JR.

Associate office: - 1 Market Place Mews, **Henley-on-Thames, Oxfordshire**, RG9 2AH.

Principal: **Jim Unwin BScFor, MICFor, FArborA, RCarborA, CEnv.**

**Chartered Forester - ICF Registered Consultant - Fellow of the Arboricultural Association -
Arboricultural Association Registered Consultant - Chartered Environmentalist.**

From:	Jim Unwin	To:	Prospective Client
Date:	Sept2019	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.

In the mid-1980s to mid-1990s for a period of about ten years he taught chainsaw, tree felling and tree surgery courses at Worcestershire Agricultural College on a part-time basis. He was assessed and passed as a LANTRA assessor in these skills, and held NPTC certificates of competence in chainsaw use on the ground and up trees.

He now works as a tree consultant / manager / contract manager to a range of clients listed below.

For tree decay testing we have a **PICUS II ULTRASOUND** tomograph with electronic callipers and **RESISTOGRAPH-R400** drill.

He works with two self-employed arboriculturalists of >20 years' combined experience:-

Jasper Fulford-Dobson Arboricultural Association Registered Consultant - 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,

Owen Hutchison BSc(Hons) Agriculture & Estate Management, Level 4 Diploma Arboriculture, LANTRA Professional Tree Inspection & working with trees since 2007, &

Alex Collier who achieved in July 2018 Level 5 Arboriculture Foundation Degree with a Distinction. In June 2016 achieved Pershore College Level 3 Extended Diploma in Forestry and Arboriculture, completing the course with a Distinction grade (+SC30).

Plus a secretary/ plan 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 No. 0330064, 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 No. 42, 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.

Company Safety Policy:- We have been successfully assessed by Safety Management Advisory Services (SMAS) as meeting CDM Regs 2015 Core Criteria Stage 1, as a **Worksafe Consultant No. 90180**. expiry 27/09/2020.
CITB Health, Safety & Environment Test for Managers & Professionals passed 22/01/2015.
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.
Planning Inspectorate (PINS) & Dept for Communities and Local Government. 2000-2017.	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 when transferred to PINS. Contract continued with PINS, as Non-Salaried Arboricultural Inspector, determining TPO appeals and High Hedge appeals. All non-salaried inspectors released in 2017.
Architects / Developers / Planning Appeals	Complete Tree Constraints, Impact Assessment & Tree Protection advice for planning, working with other professionals to input arboriculture into more complex development schemes. Recent assignments in Liverpool to Dorset, Kent, Norfolk & London. All using BS5837:2012. FULL CAD CAPABILITY.
Amey Mouchel Ltd	Overseeing Amey Tree Officer on motorway and trunkroad tree inspections throughout Midlands and Marches to 2012. Amey Mouchel are agents for Highways Agency.
CRH 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 England & Northern Ireland ongoing tree consultancy for Quarryplan.
Land Agents	Assisting Bruton Knowles clients' with woodland management and other tree issues since 1984. We also assist clients of Fisher German and Savills on a regular basis.
Tarmac Central now CRH Tarmac Ltd.	Since 1988 woodland management of Hopwas Hays Wood, Tamworth.
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 ceased around 2011.
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.
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 advice for trees on other golf courses: Eg Ross Golf Club, Swindon Golf Club .
Farm management	Management of own 95Ha farmland since 1985.

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

Appendix VII

Constraints plan :-

- **Tree Crowns**

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.**

and

- **Root Protection Areas**

RPA = circles.

See Tree Table for dimensions.

and

- **Theoretical Shading**

= quadrant of 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.

Plans are not included in pdf format of report.

Insert plans here in paper copy of report:-

Appendix VIII

Tree retention and Tree Protection Plan

Plans are not included in pdf format of report.

Insert plans here in paper copy of report:-

END.