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Ref: 8th August 2018 **Rev 12th Oct 2019** - BJU/mmi

To: **Caldecotte Group.**

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Dear Abel,

Land at The Gardener's Arms, 48 Surley Row, Emmer Green, Reading, RG4 8NA
BS5837 Tree Constraints, Impact Assessment & Tree Protection Method
Statement, for eight new residential dwellings.

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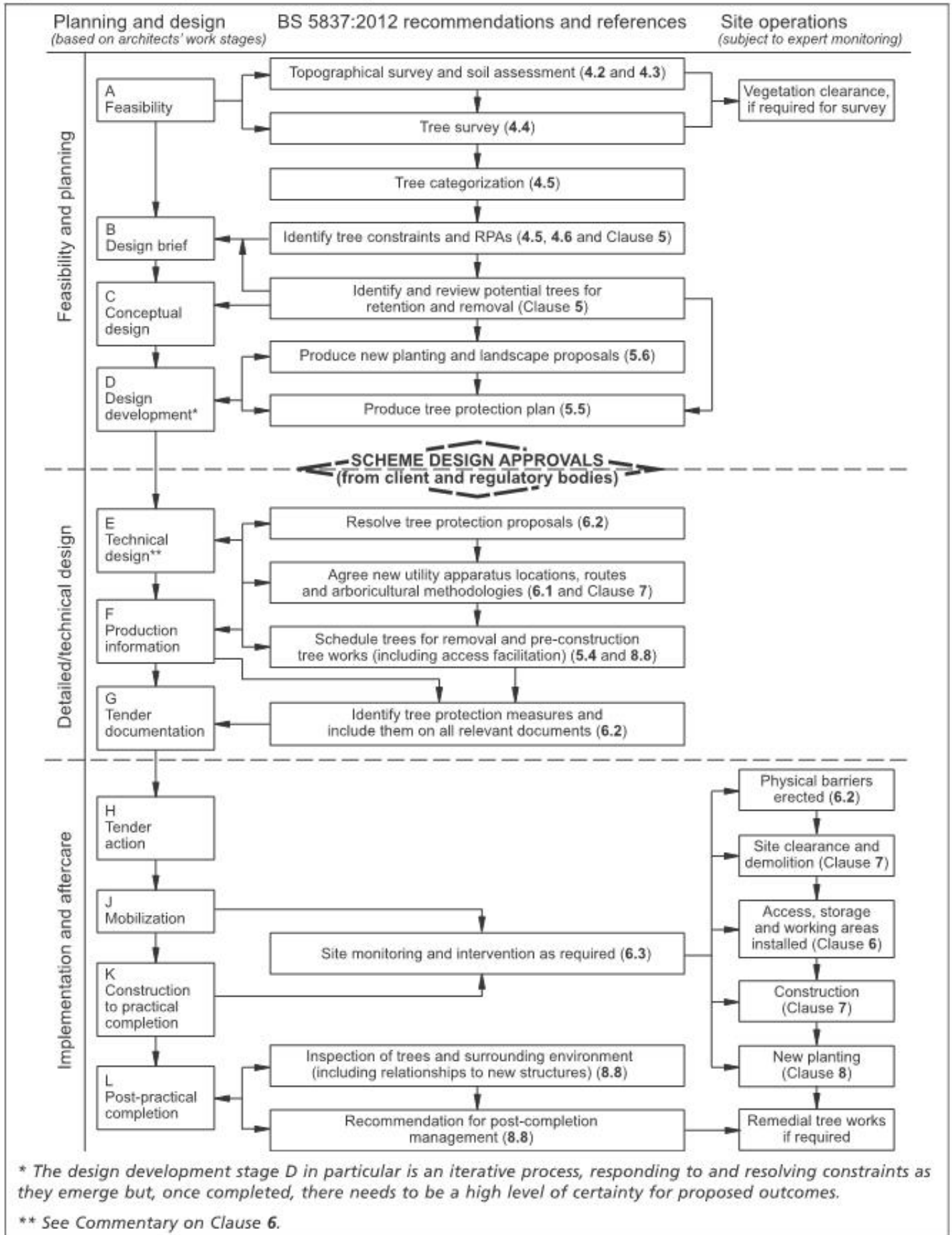
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Landscape Management

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Figure 1 The design and construction process and tree care



1. Instruction.

- 1.1 Caldecotte Group is providing advice on this residential development site. Abel Bunu 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) will 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 re-development.
- 1.3 We have used a **topo survey by Landtech Surveys of 12/07/18, YE/LS1853-1** for constraints plans. We added trees as appropriate. We use site plan **Sursham Tompkins Proposed Site Plan 6816 Rev C of 10/8/19**, which is shown in section 5, to guide our tree retention & protection method statement & Tree Retention & Protection Plan, which will be section 6 of our tree-protection 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 Owen Hutchison visited the property on 1st August 2018, and made un-accompanied inspection.
- 2.2 The survey was from ground level, involving visual observation (Visual Tree Assessment: Mattheck and Breloer, 1994 and Lonsdale, 1999). Trees were measured or estimated for dbh.
- 2.3 The survey and report for this project are by Owen Hutchison, who has > 10 years' experience working with trees, and has been checked by Jim Unwin (professional-CV attached).

3. The Site.

- 3.1 The site inspected comprises The Gardeners Arms public house and associated carpark and gardens. An area of unused ground exists in the sites north-eastern corner.
- 3.2 The site is level and relatively low lying, at around 70m aod.
The site is not exposed to wind.
Solid geology (from BGS data) for most of the site is:- Lambeth Group - Clay, Silt And Sand. Sedimentary Bedrock formed approximately 48 to 59 million years ago in the Palaeogene Period. Local environment previously dominated by swamps, estuaries and deltas.
Superficial deposits on some of the site: Black Park Gravel Member - Sand And Gravel. Superficial Deposits formed up to 2 million years ago in the Quaternary Period. Local environment previously dominated by rivers (U).
Therefore, we assume subsoil is coarse in texture and free draining. Solid geology may contain shrinkable elements but is likely to be free draining.
- 3.3 Surley Row is a public highway, running along the site's south-western boundary. No public footpaths or bridleways exist within the surveyed site.

4. The Trees.

4.1 Trees on site:-

- Trees T1 to T4 are poor quality self-seeded ash, sycamore and elder. These are located on the site's south-western boundary, and grow tight to the fence. These should be removed to prevent future damage to the fence. Stumps should be poisoned to prevent regeneration.
- Trees T5 and T6 are located on the eastern edge of the carpark. Tree T5 is an unidentifiable, ivy-clad dead tree. Tree T6 is a plum, of no particular merit.
- Tree T7 is a large over-mature cherry, located on the northern edge of the site's entrance. This tree is in poor condition and we would recommend it be felled.
- Group G8 is a mixed, native-species group, separating the pub garden from Surley Row, to the west and the access road to the north.
- Trees T12, 13 and 15 are located on an area of disused ground, in the site's north-eastern corner. Leyland cypress T12 is a large tree, which dominates its surroundings. Tree T13 is a sycamore, located just north east. It is of poor quality and suffers extensive squirrel damage. Sycamore T15 is an attractive tree and overhangs the gardens to the south and east.
- Group G9 is located to the site's north-western boundary. Most of the group is located off-site. However, a small strip along its southern edge, is located on-site. The group comprises mixed native broadleaves, effectively creating a tall, thick boundary hedge. The group represents good wildlife habitat.
- Ash T14 is located in the site's northern corner, in a natural depression.

4.2 Off-site trees:-

- Sycamores T10 and T11 are located just north-east of G9, overhanging the access road and caravans.
- Group G16, borders the site's northern boundary. These trees are located in a natural depression at approximately 2-3m below site level.
- Hedges H18 and 19 and tree T20 are located in the rear gardens, of properties adjoining the site's south-eastern boundary.

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

- Most of the surveyed trees can be viewed from Surley Row, providing visual amenity.
- Groups G8, G9 and G16, provide excellent wildlife habitat.
- Sycamore T15 is the most attractive tree on the surveyed site.
- T11, T14 & T15 are T3, T2 & T1 of Reading Borough Council TPO 13/19.

4.4 Photos below:



4.4.1 View south to trees T1 to T4 from left to right.



4.4.2 View north of cherry tree T7 and mixed-species group, G8 beyond.



4.4.3 View north east up the access road. Cypress T12 ahead, with group G9 and sycamore T10 to the left.



4.4.4 View south west, along access road to Surley Row. Groups G8 to the left and G9 to the right.



4.4.5 View south east, of sycamore T15.



4.4.6 View south east of off-site privet hedge H18 and cypress hedge H19.

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 many years of safe life).
 Vet: Veteran: usually very old; of significant historic, habitat or cultural value.

Condition / Health:- 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 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

The Gardener's Arms, Surley Row, Reading – BJUFC BS5837 inspection – 1st August 2018

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	Elder	120, 210	5	2	7	4	2	3	3	M	F/P	F/P	10-20	Two stems from 1m. Over hangs and touches adjacent outbuilding.	C2	2.4	Crown raise to provided 1m clearance of the building.
T2	Ash	240	7	1.8	10	5	3	2	2	Y	F	F/P	10-20	Growing tight to the fence. Regenerating stump 0.5m to the east.	C2	2.8	Fell and poison stump to prevent future damage to the fence.
T3	Sycamore	190	7	1.8	10	5	2	3	1	Sm	F	F/P	10-20	Growing tight to fence. Previously topped at 3.5m.	C2	2.3	Fell and poison stump to prevent future damage to the fence.
T4	Sycamore	180, 190	7	2	10	5	1	2	4	Sm	F	F/P	10-20	Two stems from base. Previously topped at 3.5m.	C2	2.6	Fell and poison stump to prevent future damage to the fence.
T5	Unidentified	350	6	1.5	6	1	1	1	1	D	D	D	<10	Unidentifiable ivy clad, dead tree.	U		Fell

T6	Plum	90	4	0.5	5	2	2	2	2	Sm	F/ P	F/ P	10- 20	Many stems at 1.5m. Bacterial canker on some stems.	C2	1.1	
T7	Cherry	350	10	3	10	5	7	5	5	Om	P	P	<10	Sever dieback and very thin crown. Ivy throughout.	U		Fell
G8	Mixed species	150	6	0	8	1.5	1.5	1.5	1.5	Sm	F	F/ P	20- 40	Mixed species group forming an unkempt high hedge. Comprising privet, ash, sycamore, hazel and elder.	C2	1.8	
G9	Mixed species	225	13	0	15	6	3	3	5	Em	F	F/ P	20- 40	Mixed species group forming a high boundary hedge. Comprising ivy clad hawthorn, sycamore, hazel and damson.	C2, 3	2.7	Sever ivy at the base of trees.
T10	Sycamore	300, 400	16	2	18	6	5	6	5	Em	F	F/ P	20- 40	Inaccessible off-site tree, with estimated position and dimensions. Thick ivy throughout.	C2,3	5.0	Sever ivy at base.
T11	Sycamore	800	16	3	18	8	7	8	7	M	F	F/ P	20- 40	Large cavity on the south side of the main stem, from base to 1.5m.	B2, 3	9.6	Sever ivy at base.
T12	Leyland cypress	800	16	1	18	5	5	5	5	M	F	F	20- 40	Large tree, dominant in its surroundings.	B2	9.6	
T13	Sycamore	180, 200, 350	15	1	17	6	6	6	4	Em	F	F/ P	20- 40	Three ivy clad stems. Extensive squirrel damage.	C2	4.4	Sever ivy at base.

T14	Ash	600	18	4	20	6	6	6	6	M	F	F	20-40	Tree with estimated position and dimensions. Located in a depression, below site level.	B2, 3	7.2	Sever ivy at base.
T15	Sycamore	800	15	1.8	17	7	5	6	7	M	F	F	20-40	Ivy clad main stems.	B1, 2	9.6	Sever ivy at base.
G16	Mixed species	350	16	1	20	5	5	5	5	M	F	F	>40	Off-site woodland group. Located in a depression approximately 3m below site level.	B2, 3	4.2	
T17	Holly	100, 100, 120, 120	4	2	4	1.5	2	2	2	Em	F	F	20-40	Maintained as a ball-shaped tree.	C2	2.2	Trim annually to maintain size and shape.
H18	Privet	90	3	0	3	1	1	1	1	Em	F	F	20-40	Well-maintained, off-site hedge.	C2	1.1	Trim annually to maintain size and shape.
H19	Leyland cypress	200	5	1.5	5	2	2	2	2	Em	F	F	20-40	Off-site hedge, topped at approximately 5m.	C2	2.4	
T20	Leyland cypress	200	6	2	8	4	4	0	4	Sm	F	P	20-40	Off-site tree, growing tight to fence.	C2	2.4	Fell.

End of table.

5. Proposed Development & Tree Impacts.

5.1 The proposal.

- 5.1.1 The proposal **Sursham Tompkins Proposed Site Plan 6816 Rev C of 10/8/19**, extract below, shows the proposal.
- 5.1.2 Proposal to demolition the existing pub and caravans, and construct of eight new residential dwellings .
- 5.1.3 Access into the site will be via the existing main drive, and access track, from Surley Row.



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.**

5.3 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:-

- Trees T1, 5, 6, 12, 13, 15 and 17 are lost.
- The northern part of G8 is also lost.
- The southern edge of group G9 will be lost, to facilitate the realignment of the fence, to the property boundary.

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:-

- Sycamore T15's rootzone could be damaged by construction access. Use TGP: see 6.3 below.

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 remaining area of G8 will shade the new driveway to units 1 and 2.
- Groups G9 and G16 and trees T10, T11 and T14 are located on the site's north-western boundary. These trees and groups will cause some light loss of units 1 and 3.
- Off-site hedges H18 and H19 and tree T20 will cause some shading of the gardens of units 5 and 6.
- Trees T2, 3, and 4 will shade unit 8. We strongly recommend the removal of these poor trees, to prevent shading and prevent future damage to the fence.
- Big sycamore T15 retained in back gardens will cast morning shade onto plot 4's house. Luckily the garden is large, so overall shading impact should be acceptable. But we recommend some trimming back of lower branches. See 6.2 below.

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:-

- The prevailing wind will blow leaves and other debris from trees T2, 3 and 4 into the gardens of units 7 and 8. We would recommend the removal of these trees to prevent leaf litter and future damage to the adjacent fence.
- Overhanging branches from trees T11 and T14 are likely to drop debris into the garden of unit 3.
- Off-site sycamore T11 needs pruning back.
- **Northern boundary G9 could be trimmed hard back to stems and allowed to grow back, and sycamores removed.**

5.7 Subsidence/heave & root growth.

5.7.1 To be assessed by an engineer referring to NHBC 4.2:2017.

British Geological Survey website data, suggests a coarse textured subsoil. However, subsoil depth is unknown.

5.8 Amenity impact.

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

- Most trees requiring removal are of limited amenity value. The removal of Leyland cypress T12 will have the largest visual impact, particularly for the properties bordering the north-eastern boundary. However, this will reduce the current impact of shading.

6. Arboricultural Method Statement in sequential order for proposed development at The Gardener's Arms site.

6.1 Supervision

6.1.1 We would recommend a pre-start site meeting between building contractor, Council Tree Officer and retained arboriculturalist to agree feasibility of tree retention, tree protection and working methods.

6.1.2 **Further** inspection to check:

- **Installation of protection fencing.**

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:-

No	Species	RPA radius m.	Work for landscape / tree health.	<u>ADDITIONAL WORK FOR DEVELOPMENT</u>
T1	Elder	2.4	Crown raise to provided 1m clearance of the building.	<u>FELL AND POISON STUMP.</u>
T2	Ash	2.8	Fell and poison stump to prevent future damage to the fence.	<u>FELL AND POISON STUMP.</u>
T3	Sycamore	2.3	Fell and poison stump to prevent future damage to the fence.	<u>FELL AND POISON STUMP.</u>
T4	Sycamore	2.6	Fell and poison stump to prevent future damage to the fence.	<u>FELL AND POISON STUMP.</u>
T5	Unidentified		Fell	<u>FELL AND GRIND OUT STUMP.</u>
T6	Plum	1.1		<u>FELL AND GRIND OUT STUMP.</u>
T7	Cherry		Fell	<u>FELL AND GRIND OUT STUMP.</u>
G8	Mixed species	1.8		<u>FELL NORTHERN SECTION AND GRIND OUT STUMPS..</u>

G9	Mixed species	2.7	Sever ivy at the base of trees.	<u>FELL STEMS AS REQUIRED FOR FENCE REALIGNMENT. GRIND OUT STUMPS. FELL SYCAMORES. TRIM BACK OTHER STEMS ON SOUTHERN SIDE AND REDUCE HEIGHTS BY ONE THIRD.</u>
T10	Sycamore	5.0	Sever ivy at base.	
T11	Sycamore	9.6	Sever ivy at base.	<u>TRIM BACK SOUTH-EAST SIDE BY 2M OFF SOUTH-EASTERN SIDE.</u>
T12	Leyland cypress	9.6		<u>FELL AND GRIND OUT STUMP.</u>
T13	Sycamore	4.4	Sever ivy at base.	<u>FELL AND GRIND OUT STUMP.</u>
T14	Ash	7.2	Sever ivy at base.	
T15	Sycamore	9.6	Sever ivy at base.	<u>TRIM BACK BOTTOM 1/3 OF CROWN ALL AROUND TREE BY 1.5M OFF RADII TO ALLOW MORE LIGHT PAST TREE.</u>
G16	Mixed species	4.2		
T17	Holly	2.2	Trim annually to maintain size and shape.	<u>FELL AND GRIND OUT STUMP.</u>
H18	Privet	1.1	Trim annually to maintain size and shape.	
H19	Leyland cypress	2.4		
T20	Leyland cypress	2.4	Fell.	

End of table.

(Treework following development see 6.10 below)

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 Habitat Directive 1992, CROW Act 2000 & Protection of Badgers Act. 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 (unlikely).

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 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.)

6.3 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.**
- 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 needed here to facilitate construction access within T15's RPA.
- 6.3.3.2 Three 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:-

- Retain and use both existing asphalt-surfaced access roads.
- All nearby trees and hedges need protection.
- No pedestrian, 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; 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:-

No special measures needed.

6.6 Foundations within RPAs:-

No special measures needed to protect trees.

6.7 Drainage.

- 6.7.1 Storm-water drainage: Any soak-away system must be designed to avoid significant increase and no decrease of ground water in trees' rooting zones. We suggest direct roof water into ditches.
- 6.7.2 Foul Drainage: keep away from trees. Link to existing if possible.
- 6.7.3 Sustainable Urban Drainage System: Any SUDS scheme, to reduce the load on local mains drainage, must not significantly add to the soil water in trees' root zones. Water can be diverted into the ground or into storage tanks.

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.
- 6.8.2 Trenches **within RPAs should be avoided. Use existing runs wherever possible.**
- 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 new paths proposed near trees. There is no obvious requirement for minimal-dig surfaces following tree and group removal.

6.9.3 If they are: Appendix IV shows gravel trays and Cellweb for creating stronger, porous, roadways within RPAs, which could be filled with angular clean gravel, allowed to grass naturally, or topped with hard surfacing.

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: perhaps to reduce shading or stop leaves blowing into gardens.

-or complete tree removal if trees were considered too close for safe retention.

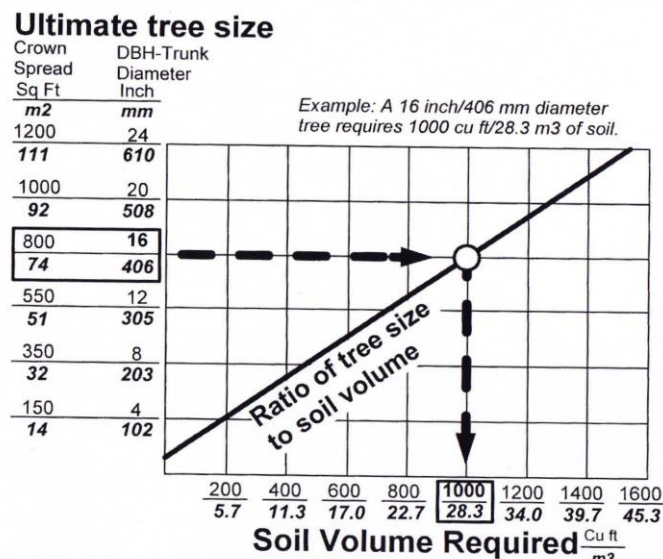
6.10.2 All additional work subject to further local authority agreement if trees are protected by TPO or planning conditions, or stand within a Conservation Area.

6.11 New Planting.

6.11.1 New tree and shrub planting has been proposed throughout the development. However, size and species are unknown. The most significant proposed tree planting appears to be along the site's north-eastern boundary, in the rear gardens of units three to six.

6.11.2 Any planting must provide adequate long-term soil-moisture availability: graph from James Urban (Up by Roots, ISA, 2008), to remind designers:

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



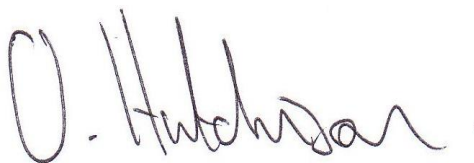
6.11.3 Any planting and maintenance to comply with: **BS 8545 “Trees: from nursery to independence in the landscape – Recommendations”**. BSI 2014.

7.0 Conclusions

- 7.1 The proposed development requires the removal of two U category trees (T5 and T7) and seven C category trees (T1, 2, 3, 4, 6, 12 and 17). T11 needs pruning back.
- 7.2 The proposed new access to units one and two, will require the partial removal of group G8.
- 7.3 The realignment of the existing north-western boundary fence, will require the removal of some of G9. We recommend pruning of G9.
- 7.4 Tree loss will be mitigated by proposed tree planting along the north-eastern boundary.

Please contact us for further information.

Yours sincerely,



For 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 *“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.

Appendices 1 to VIII.

- Appendix I Location & Google Earth aerial.
- Appendix II Vertical Tree Protection Fencing, from BS58
- Appendix III Horizontal Ground Protection x 2 examples
- Appendix IV Shallow trays for strengthening gravelled or grassed areas.
Slightly deeper (50mm or 80mm trays for strengthening gravelled or grassed areas.
Deeper Cellweb 3-D grid for strengthening tracks.
- Appendix V Example of Air-spade.
- Appendix VI **B J UNWIN FORESTRY CONSULTANCY CV.**

Appendix VII Constraints plans :- Tree Crowns
Root Protection Areas
Theoretical Shading.
Appendix VIII Tree retention and Tree Protection Plan

Appendix I

Location



Google Earth aerial.
Taken 2017.



Appendix II

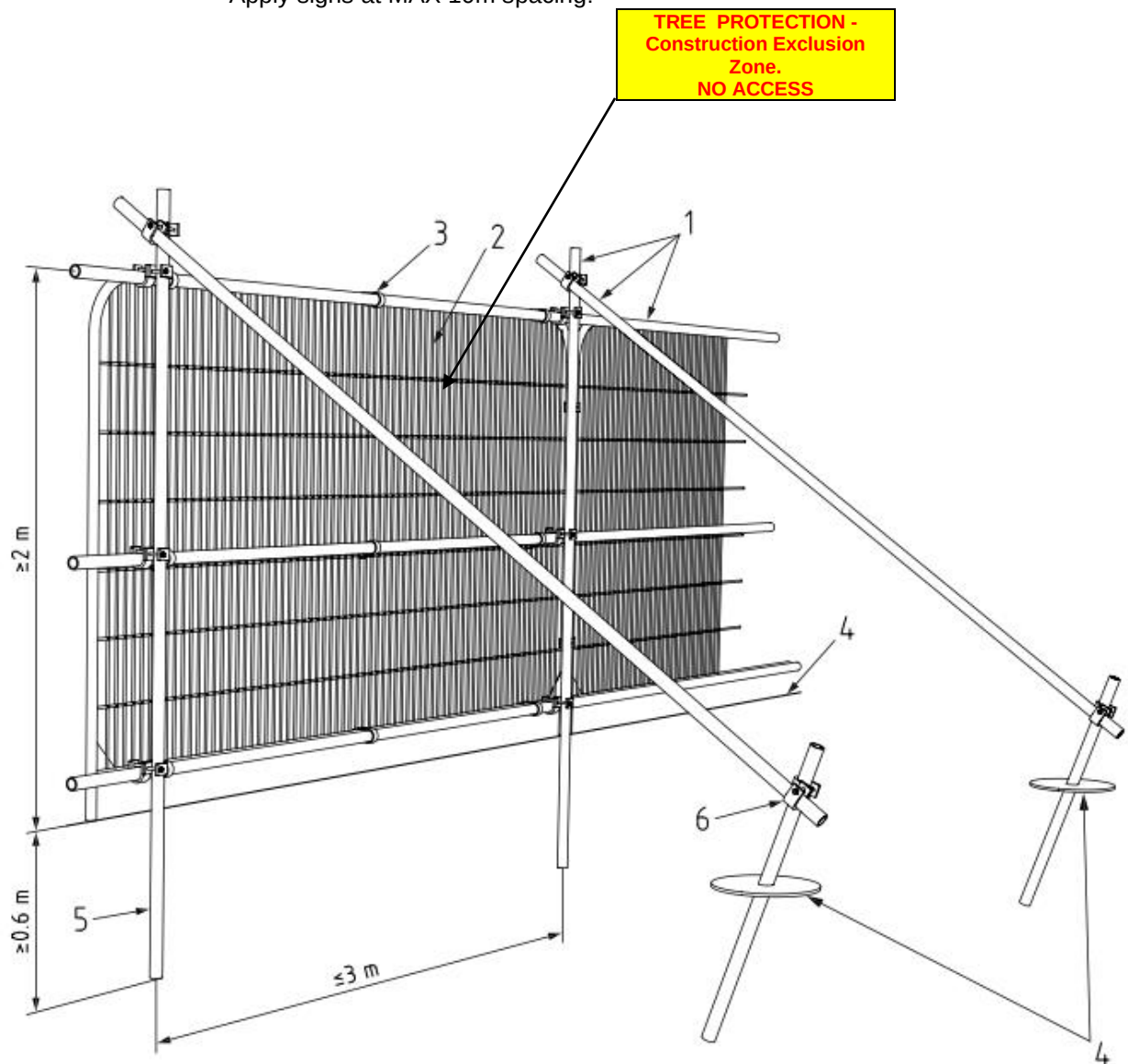
Vertical Tree Protection Fencing, from BS5837.

Heras panels on rubber feet, pinned braces.

Vertical protective fence: location on plan:

Default in situ > 3 months:-

Apply signs at MAX 10m spacing:



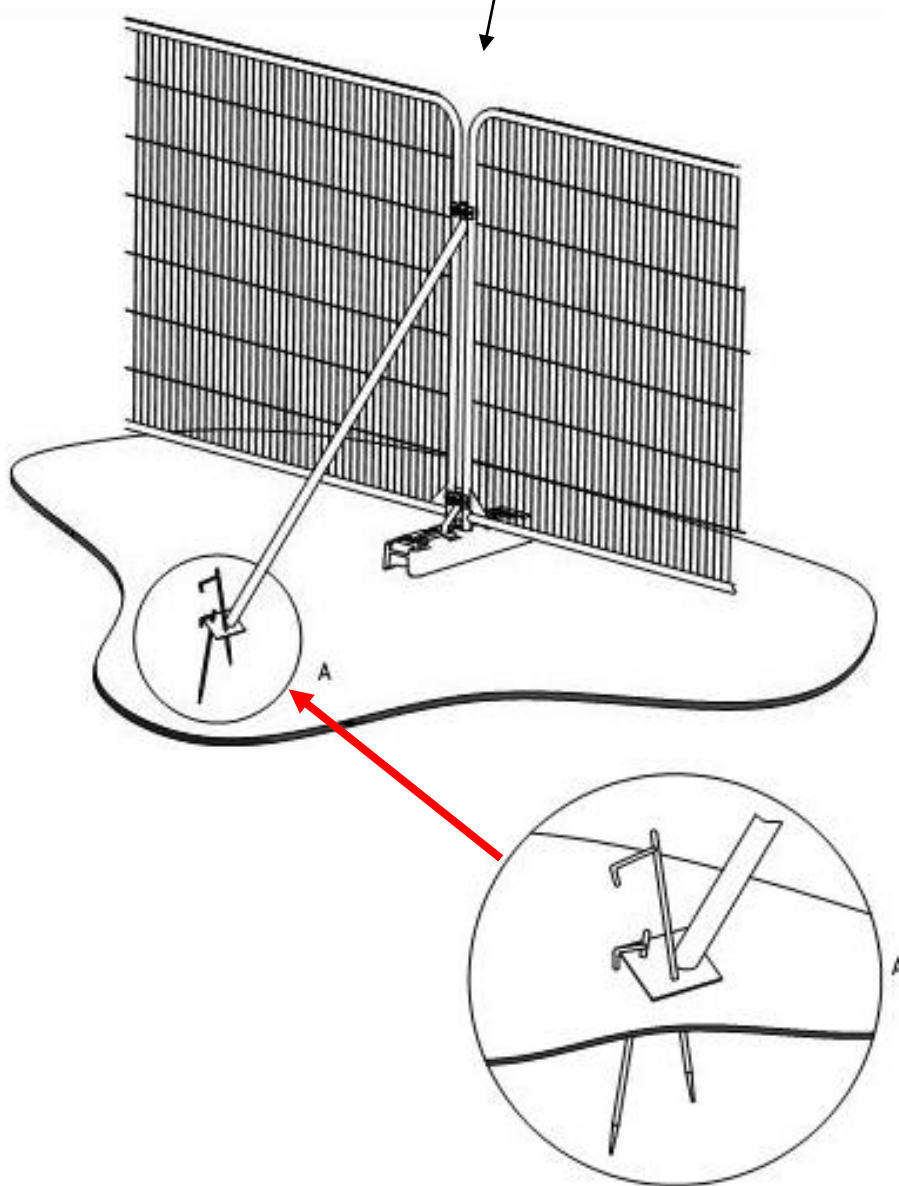
Key

- 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

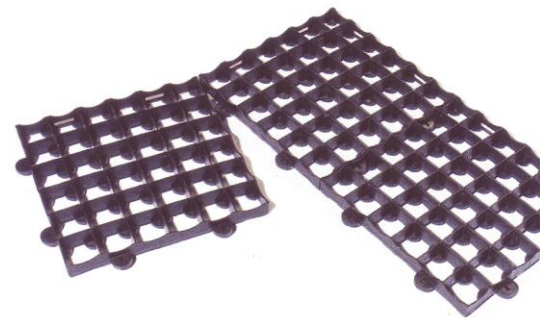
Trays for strengthening gravelled or grassed areas. (50mm or 80mm trays for strengthening gravelled or grassed areas.

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:

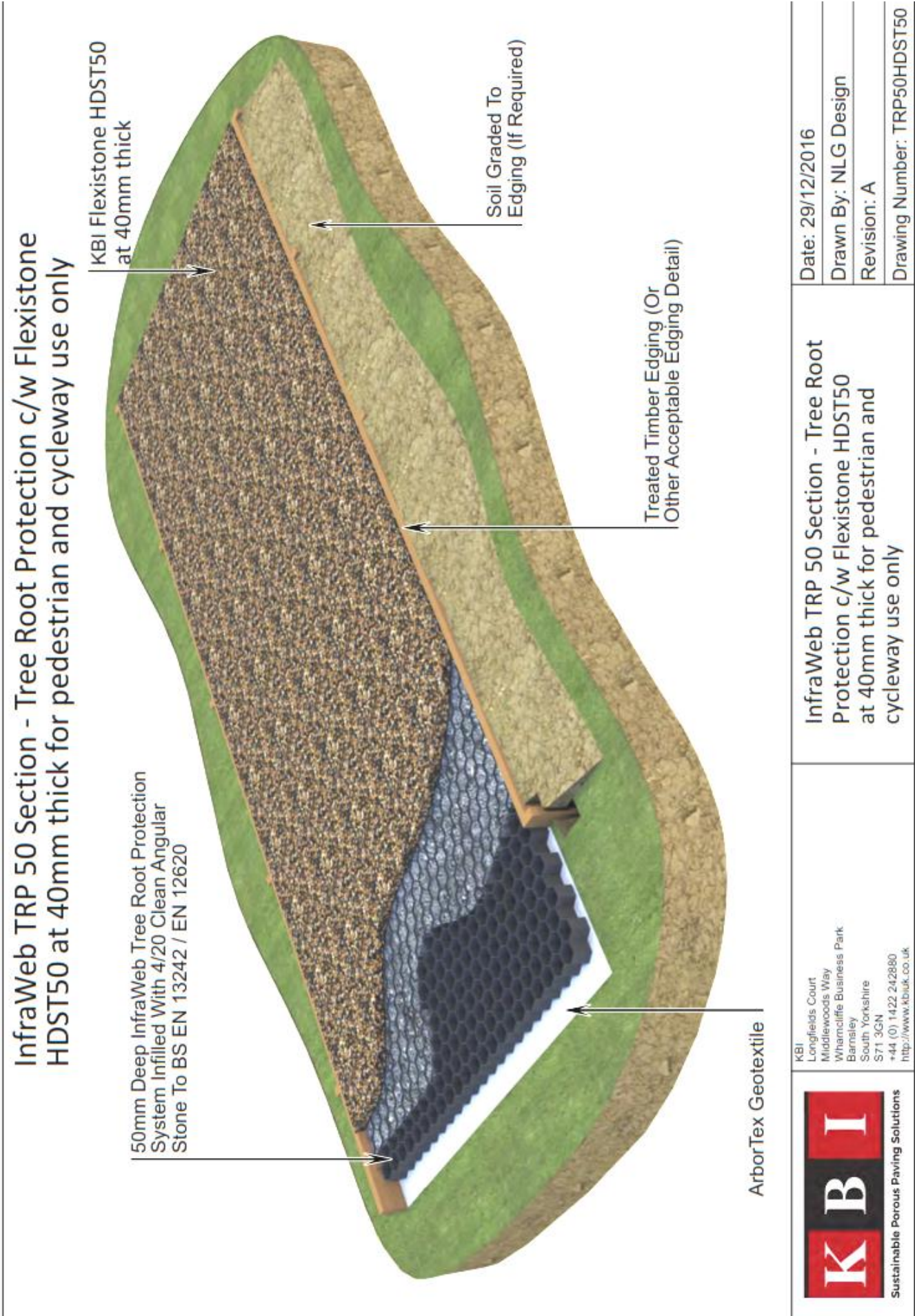
- Overspill car parking
- Emergency access and service roads
- Caravan hardstanding
- Verge hardening
- Service Roads
- Pedestrian walkways and towpaths
- Bridle ways
- Helipads
- Golf course pathways / Tee reinforcement

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.

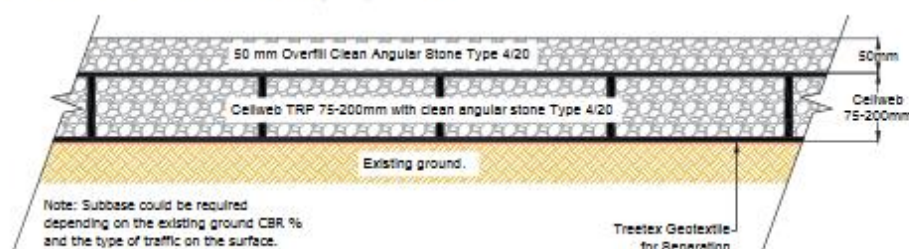
Cellweb® 3D Cellular Confinement. The Cellweb® is installed on top of the Treetex™ layer. This is fixed to the ground using ten steel J pins per panel. The panels can be cut to the required shape and adjoining panels can be connected using heavy duty staples or cell ties.

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 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.**

and

- **Root Protection Areas Plan**

RPA = circles.

See Tree Table for dimensions.

and

- **Theoretical Shading Plan**

= 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.