

## B. J. UNWIN FORESTRY CONSULTANCY Ltd.

Jim Unwin **BScFor, MICFor, FArborA, CEnv.**  
Chartered Forester  
Fellow of the Arboricultural Association  
Chartered Environmentalist.



Parsonage Farm,  
Longdon  
Tewkesbury,  
Glos.  
GL20 6BD  
UK  
T: 01684 833538  
M: 07860 376527  
E: [Jim@bjunwin.co.uk](mailto:Jim@bjunwin.co.uk)

Client:



C/o:

**Richard Brailsford** MSc BSc (Hons) MCIAT  
Building Surveyor  
Estates, Estates & Facilities  
Northavon House ([1NAH002](#))  
M: 07816142624  
[Richard3.Brailsford@uwe.ac.uk](mailto:Richard3.Brailsford@uwe.ac.uk)

Site:

**UWE The Hollies Residences, Quarry Way, Bristol BS16 1FU.**

Subject:

**BS5837 Tree Constraints, Tree Impacts and draft Tree Protection Method Statement for replacement gates.**

Surveyor:  
Report:  
Dates:

Jim Unwin.  
Jim Unwin. (professional-CV in Appendix VI).  
Inspection 29<sup>th</sup> Nov 2023 Report: Stage 1 2<sup>nd</sup> Dec 2023 & Stage 2: **4<sup>th</sup> Dec 2023**

### **Summary:**

- The Hollies residences lies within a residential area.
- The frontage onto Quarry Way has several good trees including three pretty cherries, a Norway maple, wild cherry and a big horse chestnut.
- The new gate cuts into the outer edge of Cherry T3's RPA.
- Trees can be protected by measures specified in section 6 of this report.

Tree and Woodland Consultancy  
Woodland Valuation and Timber Sales  
Landscape Management

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information.



Visual Tree  
Assessment

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**Notes:**

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## **1. Instruction.**

- 1.1 UWE, assisted by Building Surveyor Richard Brailsford, intend to replace the gates at The Hollies.
- 1.2 The local authority (Bristol City 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 development. Therefore, Richard has asked B J Unwin Forestry Consultancy Ltd to advise on trees for planning application purposes.
- 1.3 I have used **topo survey by unknown surveyor** for constraints plans, and updated it. The Proposal: **The Hollies New Entrance Gates B-0-03 Rev C1 of 24/11/23**, extract in section 5, shows the proposal, and guides our tree impact and tree protection sections 5 & 6 of this report.
- 1.4 Therefore methodology of the report below follows *BS5837:2012 Trees in Relation to Design, Demolition & Construction*.

## **2. Inspection.**

- 2.1 Jim Unwin visited the property on 29<sup>th</sup> Nov 2023, and made an un-accompanied inspection in good light conditions.
- 2.2 The survey was from ground level, involving visual observation (Visual Tree Assessment: Mattheck and Breloer, 1994 and Lonsdale, 1999). I measured some dbh, (estimated for off-site and inaccessible trees) measured or estimated height, and measured or paced crown spread. I added most trees with locations laser measured from known points.

## **3. The Site.**

- 3.1 The site inspected is the front carpark of The Hollies. It comprises railings along the back of the public footway, a 4-10m grass verge, then asphalt carpark. The gated entrance and bin store are towards the western end.
- 3.2 The site is low-lying, at around 48m aod, with no steep slopes. The site is not exposed to wind.
- 3.3 British Geological Survey website suggests geology is:  
**Superficial deposits:** No superficial deposits recorded  
**Bedrock geology:** Downend Member - Sandstone. Sedimentary bedrock formed between 315.2 and 309.5 million years ago during the Carboniferous period.  
So subsoil and geology at foundation depth could be coarse-textured. This needs confirmation by ground investigation.
- 3.4 The site is edged by residential Quarry Way, and houses to the north, west and east, and by the 3-storey building of Hollies Blocks 1, 2 & 3 to the south. (See map and Google Earth image in Appendix II.)

#### **4. The Trees.**

##### **4.1 Trees on site:-**

- The frontage has three grafted flowering cherries T3, T4 & T5 either side of the gateway. They will have short remaining lives but have pretty blossom.
- Horse chestnut T2 is a huge tree, and unusually still has low limbs.
- T6 is a good Norway maple, and T7 was a grafted flowering cherry, but the ornamental top died and now four wild cherry stems make a handsome tree.

##### **4.2 Off-site trees:-**

- The western boundary is an overgrown Lawson cypress hedge H1, and the residences has many other trees around its edges.

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

- T2-T7 are prominent in the street scene, and partially hide the large residences building from the road.
- The site is part of a busy University campus. So all soft landscape, including trees, is important for well-being of students, visitors and staff.
- The site does not lie within a Conservation Area, and I am unaware of Tree Preservation Orders constraining the site (but please email [planning.searches@bristol.gov.uk](mailto:planning.searches@bristol.gov.uk) to confirm).

##### **4.4 Photos below:**



##### **4.4.1 View west past cherry T7 along frontage. Horse chestnut T2 at rear.**





**4.4.2 View north west to entrance. Note electrical junction box for existing gates on left by bin store.**



**4.4.3 View north to T4, and T5 & T6 far right.**

## **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 Contribution, in years**

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

**Retention categories, based on BS 5837 Section 4.5, and shown in Appendix I, 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 area rootable soil required to sustain the tree, centred on the tree's trunk. The RPA can be a varied shape enclosing the correct rootable area: but usually shown as a circle for convenience, unless obvious constraints stop rooting.

**Radius 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).

(Area can be calculated by  $\pi \times r^2$ .)

**# - Denotes estimated stem diameter in mm at 1.5m height where measurement was not possible.**

**T = tree S = shrub H = hedge G = group HG = hedge group.**

4.5.2 **UWE, The Hollies Residences, - BS5837 Inspection - BJUFC – 29<sup>th</sup> November 2023**

No.	Species	Dbh (stem diam @ 1.5m ht) mm.	-Total height. -Ht of lowest branch & direction. - Est Ht in 10 yrs. m.			Crown radii m.				Age class	Health	Structural Condition	Remaining contribution Years.	Comment (All are in average to good health and condition, unless stated otherwise.)	BS5837 Retention category	BS 5837 Root Protection Area Radius. m.	Recommended WORK excluding development.
						NW	NE	SE	SW								
H1	Lawson cypress	200-250	7-9	1	7-10	1.75	1.75	1.75	1.75 ext.	Em	F	P/F	>20	Overgrown hedge.	C2	3.0	Top and shape every three years.
T2	Horse chestnut	970	24	2.5	24	9.5	11.4	9.6	9.8	M	F	F	>20	Big low limbs.	A2	11.6	
T3	Flowering cherry	360	7.5	2.1	8	6.9	5.5	5.0	6.3	M	F	F	>10	Pretty. Basal graft.	B2 for amenity	4.3	
T4	Flowering cherry	320	7	1.8	7.5	5.0	6.8	5.7	4.9	M	F	F	>10	Basal graft.	B2 for amenity	3.8	
T5	Flowering cherry	330	7.5	2	8	4.5	5.5	4.8	5.4	M	F	F	>10	Basal graft.	B2 for amenity	4.0	
T6	Norway maple	420	14	2.5	16	4.8	4.5	4.8	4.7	Em	F	F	>40		A1	5.0	

T7	Wild cherry	150, 150, 240, 250	13	2.5	16	5	5	5	5	Em	F	P/F	>20	Rootstock from failed ornamental.	B2	4.9	
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4.5.3 Trees are listed in the table above, and coloured on the Tree Constraints Plans, to indicate their retention categories A,B,C,U: with the colours explained in the keys of the table (4.5.1) & plan, and Appendix I (A = best to U = remove).  
This allows the site designer to plan around important trees, and ignore lesser trees.



## 5. Proposed Development & Tree Impacts.

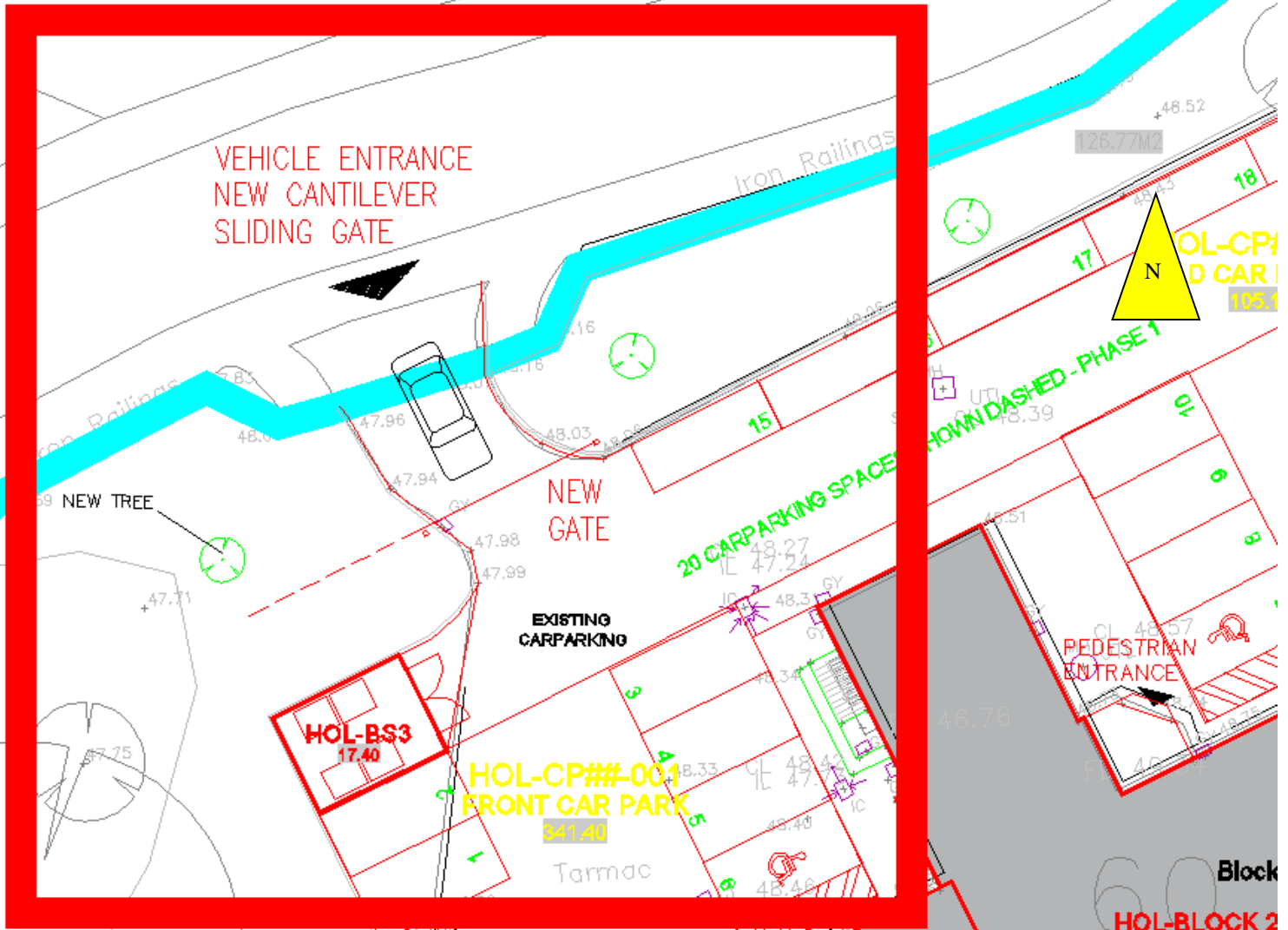
### 5.1 The proposal.

5.1.1 The proposal, The Hollies New Entrance Gates B-0-03 Rev C1 of 24/11/23, extract below, shows the development.

5.1.2 The existing hinged gates are replaced by a sliding barrier.

## THE HOLLIES : VEHICLE ENTRANCE OFF QUARRY WAY

NEW CANTILEVER SLIDING GATE POSITIONED TO ALLOW STATIONARY VEHICLE TO STAND CLEAR OF QUARRY WAY PASSING TRAFFIC AND PAVEMENT. FOR GATE DETAIL REFER TO ABGA LTD DRAWING NUMBERS 4627/ 01 AND 02.



## **5.2 Potential Tree Impacts (considered below).**

5.2.1 There are six potential arboricultural impacts caused by re-development of the site:

- **physical contact above-ground,**
- **below-ground conflicts (roots),**
- **shading,**
- **over-bearing, and falling material,**
- **subsidence/heave, and damage from root growth,**
- **impact on amenity value.**

These are assessed below:

## **5.3 Physical contact with above-ground parts of trees.**

5.3.1 General:-

Buildings, roads, paths and associated structures can replace trees or intrude into canopy zones. Tree removal and pruning is listed in table 6.2.3 below.

5.3.2 Specific above-ground impacts:-

- None obvious.

## **5.4 Below-ground root spread.**

5.4.1 General:-

BS5837 defines a tree's Root Protection Area as a circular area of 12 x stem diameter: required to maintain long-term health of a full-canopied tree. We show it as an idealised circle. Rooting areas are never symmetrical. At the discretion of an arboriculturalist, where rooting is restricted on one side, the RPA can be offset to provide the same protection area. This would be shown on the RPA plan.

Ground disturbance within the RPA zone should be avoided. But, the structural rootplate of a tree to resist windthrow is usually smaller than the RPA. Therefore tree stability should not be affected by some planned disturbance within the RPA.

5.4.2 Specific Rootzone Impacts:-

- The receptor end for the sliding gate enters a quadrant of cherry T3's RPA. The tree can root in other directions so root loss is not significant. I require hand severing of any roots found. See 6.5 & 6.6 below.

## **5.5 Light Interception & Shading.**

5.5.1 General:-

The sun rises to about 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 light interception is much reduced.

Theoretical shadows of arcs equal to estimated tree height in ten-years' time are illustrated on our Shading Plan. This is the shadow pattern for the period from May to September inclusive, from 10.00hrs to 18.00hrs daily.

### 5.5.2 Specific Shading Impacts:-

- All trees are small or medium-sized: no issues.

## **5.6 Over-bearing and Falling material.**

### 5.6.1 General:-

Trees drop detritus in the form of flower parts, leaves, twigs, fruits or needles throughout the year. These can be an annoyance to persons living nearby. Bird droppings and honeydew from aphids can be difficult to clean off, or can spoil car paintwork. Big trees make adjacent dwellers nervous.

### 5.6.2 Specific Impacts:-

- Leaves etc can fall into runners and mechanism. So regular maintenance required to keep the mechanism running smoothly.

## **5.7 Subsidence/heave & root growth.**

5.7.1 Subsoil and geology are most-likely coarse-textured without volume-change potential, so future subsidence or heave risk should not be considerations.

5.7.2 But, these must be assessed by an engineer. Structures in the ground will need foundations designing according to NHBC Chapter 4.2, or equivalent guidance.

## **5.8 Amenity impact.**

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

- Overall amenity impact from the proposals is negligible.

## **6. DRAFT Arboricultural Method Statement in sequential order for proposed development at The Hollies carpark.**

### **6.1 Supervision**

6.1.1 We would recommend the following arboriculturist supervision on this site:-

- A **pre-start site meeting** between architect, landscape architect, groundwork / landscape contractor, Council Tree/Landscape Officer (if he/she chooses to attend), and retained arboriculturist to agree tree protection and working methods.
- **Check that site management has approved tree protection report and plans, and copies are available on site.**
- **Installation of protection fencing and temporary ground protection.**
- **Toolbox talk with groundworkers pruning roots.**

6.1.2 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. Although I am not aware of any.

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 "*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 development at UWE Hollies frontage site:-

No	Species	RPA radius m.	Work for landscape / tree health.	<b><u>ADDITIONAL WORK FOR DEVELOPMENT</u></b>	
				<b><u>Specification.</u></b>	<b><u>Reason for additional work for development.</u></b>
H1	Lawson cypress	3.0	Top and shape every three years.	<b><u>None required.</u></b>	
T2	Horse chestnut	11.6			
T3	Flowering cherry	4.3			
T4	Flowering cherry	3.8			
T5	Flowering cherry	4.0			
T6	Norway maple	5.0			
T7	Wild cherry	4.9			

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 Retention & Protection Plan (TRP) in Appendices.

FENCE LOCATIONS MAY BE AMENDED ON SITE ONCE EXACT CONSTRUCTION ACCESS ROUTES ARE AGREED.

6.3.2.2 Two **specifications** for suitable protective fencing are suggested in BS5837. **Lightweight fencing will suffice on this modest site. Specification is given in Appendix III.**

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 most hard landscaping work is completed, and lifted as required 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 UNLESS PLANT ACCESS IS REQUIRED CLOSER TO TREES THAN PROTECTION FENCING ALLOWS.**

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 50mm depth of woodchip or bark mulch, as shown in Appendix IV.

-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 50mm depth woodchip or bark mulch (pedestrian access only).

## **6.4 Construction Access.**

### 6.4.1 General points:-

- I assume access will be from the existing carpark.
- All retained 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.

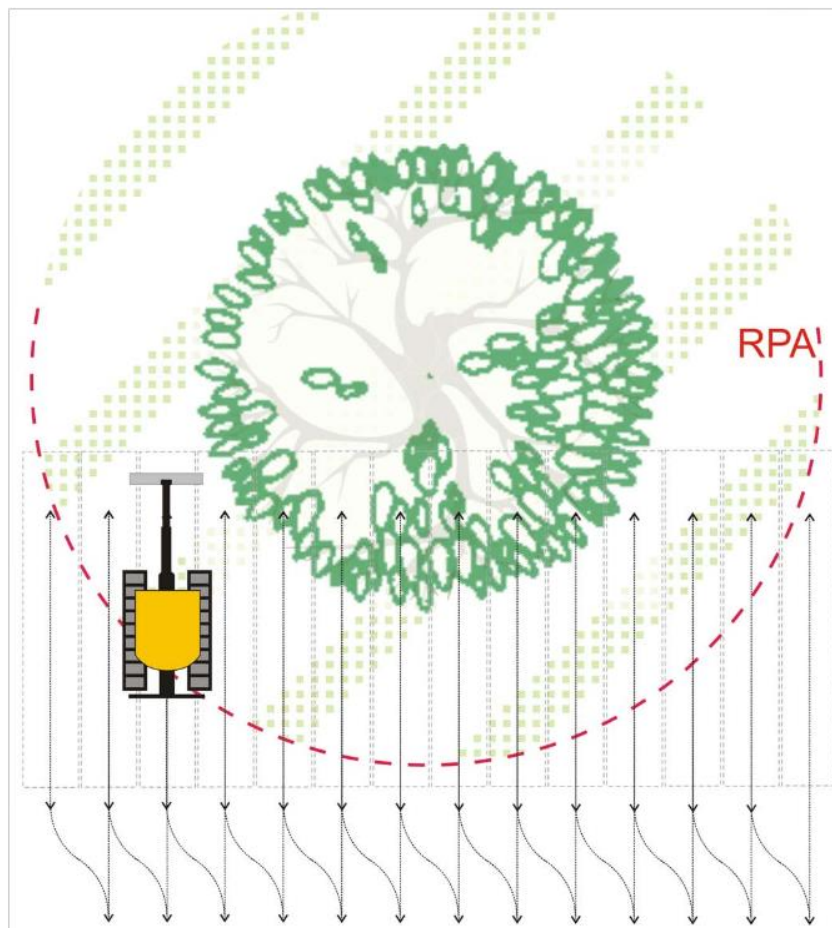
6.4.2 Site huts could be placed within RPA of trees and hedges; provided they stand elevated on stilt feet, no excavation is required for temporary services, and pedestrian and vehicle access is ground protected as detailed in 6.3.3 above.

## **6.5 Demolition / Excavation within RPAs:-**

6.5.1 Specification to excavate base stations at either end of gate by T3 & T4.

Method below....

- Parallel tracking with slewing outside the RPA:-
- Use maximum 1.5-tonne rubber-tracked mini-digger.
- **Scrape off only asphalt, turf or loose layer to 100mm max. depth.**
- **If deeper dig required, dig carefully, and banksman to use loppers to sever roots as soon as exposed.**
- Insert heavy-duty plastic on tree side of any excavation immediately after digging to reduce desiccation.
- Slew outside RPA.
- Heap spoil outside RPA, for dumper to collect and run outside RPA.



## **6.6 Foundations within RPAs:-**

### **6.6.1 Base station for sliding gate near T3:**

- Excavate as shown in 6.5 above.
- Before pouring concrete, ensure tree side of trench is lined with heavy-duty plastic, or line holes, to prevent concrete contamination of ground.

## **6.7 Drainage.**

We are unaware of a drainage design, and assume existing drainage will be retained, but general tree protection principles must be followed:

### **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. Divert into soakaways outside RPAs, or store for greywater recycling.

### **6.7.2 Foul Drainage:** Not relevant here.

### **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. Drain into ponds, store for greywater re-use, or allow percolation into gardens or parking areas.

## **6.8 Service Trenches within RPAs.**

### **6.8.1** We are unaware of proposed services, but service trenches (electric lights, utilities, telecoms, drains etc) must be **designed** to run as far from trees as possible. **USE EXISTING CABLE DUCTS AND RUNS WHEREVER POSSIBLE.**

### **6.8.2** Trenches **within RPAs should be avoided. But if there is no other option:-**

### **6.8.3** Any trenching within an RPA ideally uses a **trenchless boring** system.

### **6.8.4** Otherwise use onerous **hand digging** method:-

- If soil is coarse-textured and friable use an air-spade to reveal roots (Appendix VI).
- No roots >25mm diameter or bundles of smaller roots must be exposed or severed without express written permission of local authority tree officer or retained arboriculturalist.
- Retain roots >25mm diameter or bundles of smaller roots within service trenches. Thread service pipe underneath.
- Any root pruning must use a sharp saw or loppers, and not ripped by digger bucket.
- 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 or bundles of smaller roots 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 Appendix V gives examples of materials for minimal-dig, porous, build-up. But these are not needed unless significant hard surfacing is needed near trees.

**6.10 Tree work following construction.**

6.10.1 Trees should be re-inspected at completion of construction and hard landscaping. 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 planning conditions, TPO, or location within a Conservation Area.

**6.11 New Planting.**

6.11.1 The site contains trees. The cherries are healthy but have short lives <20 years.

**New planting is not needed as part of this application.**

6.11.2 A useful web-based guide: *Tree Species Selection for Green Infrastructure – A guide for specifiers by Dr Andrew Hiron & Dr Henrik Sjoman Issue 1.3 of 2019*, advises on tree selection and size.

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

6.11.3 Any planting must be provided with adequate long-term soil-moisture.

To remind architects and engineers, we reproduce below, Stockholm Tree Pits’ ([www.stockholmtreepits.co.uk](http://www.stockholmtreepits.co.uk)) table of root volumes for a given final size of tree:

*\*Fastigate trees will require less rooting space than trees with wide canopy shapes. As a rule of thumb, one should assume that a tree with a narrow and columnar crown form would require half as much soil volume as a tree of the same height that has a wide crown.*

*!Ideally the surface of the tree pit should be open, rough in texture, and protected from compaction. If there is hard surfacing above the tree pit designers must provide pathways for water ingress and gaseous exchange. This could be provided by a permeable surface over the whole of the tree pit or by using a non-permeable surface with specially designed inlets. Suitable inlets would be substantially larger than an irrigation tube and service the whole of the tree pit.*

Table 1: Minimum requirements for tree pit specifications.

	Mature Size of Tree**				
	Very Small (<5m)	Small (5-10m)	Medium (10-15m)	Large (15-25m)	Massive (>25m)
Recommended minimum volume of uncompacted loam soil	6m <sup>3</sup> (5m <sup>3</sup> if shared)	12m <sup>3</sup> (9.5m <sup>3</sup> if shared)	20m <sup>3</sup> (16m <sup>3</sup> if shared)	28m <sup>3</sup> (24m <sup>3</sup> if shared)	36m <sup>3</sup> (30m <sup>3</sup> if shared)
Recommended minimum volume of stone-based structural soil	8m <sup>3</sup> (6m <sup>3</sup> if shared)	15m <sup>3</sup> (12m <sup>3</sup> if shared)	26m <sup>3</sup> (20m <sup>3</sup> if shared)	36m <sup>3</sup> (28m <sup>3</sup> if shared)	45m <sup>3</sup> (35m <sup>3</sup> if shared)
Recommended number of air/water inlets†	1 (0.5 if shared)	1 (0.5 if shared)	1	2 (1.5 if shared)	2

Author:



**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.
- "Tree Species Selection for Green Infrastructure – A guide for specifiers"* Dr Andrew Hiron & Dr Henrik Sjomon Issue 1.3 2019.
- "Treework at Height"* Industry Code of Practice. Arboricultural Association. 2020.

**Appendix I**

**BS 5837 section 4.5 Tree Categorisation Method.**

**Table 1 overleaf:**

Table 1 Cascade chart for tree quality assessment

Category and definition	Criteria (including subcategories where appropriate)	Identification on plan			
<b>Trees unsuitable for retention</b> (see Note)					
<b>Category U</b>	<ul style="list-style-type: none"> <li>Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning)</li> <li>Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline</li> <li>Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality</li> </ul>	See Table 2			
<i>NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve; see 4.5.7.</i>					
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">1 Mainly arboricultural qualities</th> <th style="width: 33%;">2 Mainly landscape qualities</th> <th style="width: 33%;">3 Mainly cultural values, including conservation</th> </tr> </thead> </table>			1 Mainly arboricultural qualities	2 Mainly landscape qualities	3 Mainly cultural values, including conservation
1 Mainly arboricultural qualities	2 Mainly landscape qualities	3 Mainly cultural values, including conservation			
<b>Trees to be considered for retention</b>					
<b>Category A</b>	Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	See Table 2			
<b>Trees of high quality</b> with an estimated remaining life expectancy of at least 40 years	Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)			
<b>Category B</b>	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation	See Table 2			
<b>Trees of moderate quality</b> with an estimated remaining life expectancy of at least 20 years	Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality	Trees with material conservation or other cultural value			
<b>Category C</b>	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	See Table 2			
<b>Trees of low quality</b> with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm	Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits	Trees with no material conservation or other cultural value			



## Appendix II

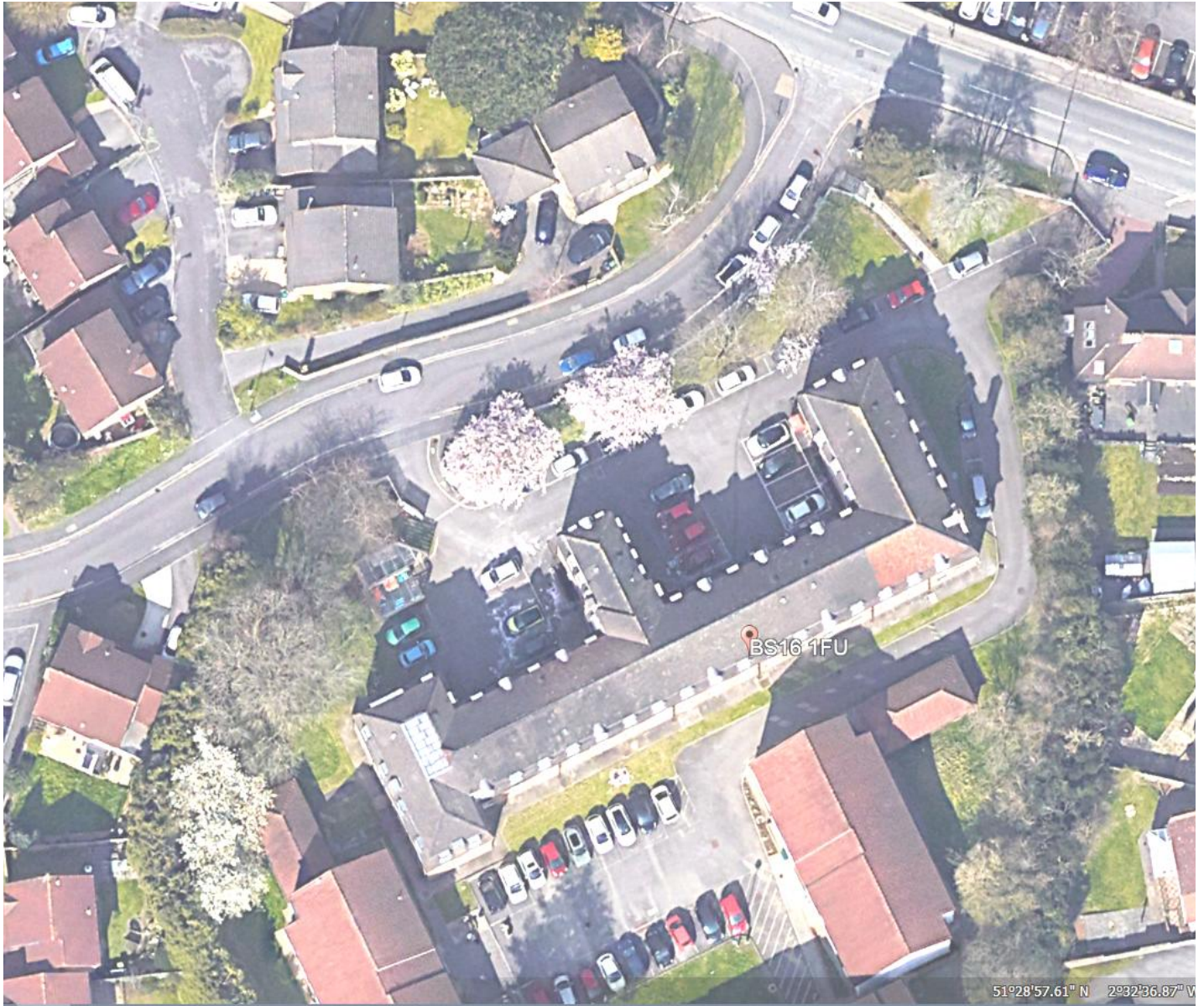
Site location, shows local roads and public rights of way.







Google Earth aerial.  
Taken 2022.



Appendix III

**Vertical Tree Protection Fencing, from BS5837.**

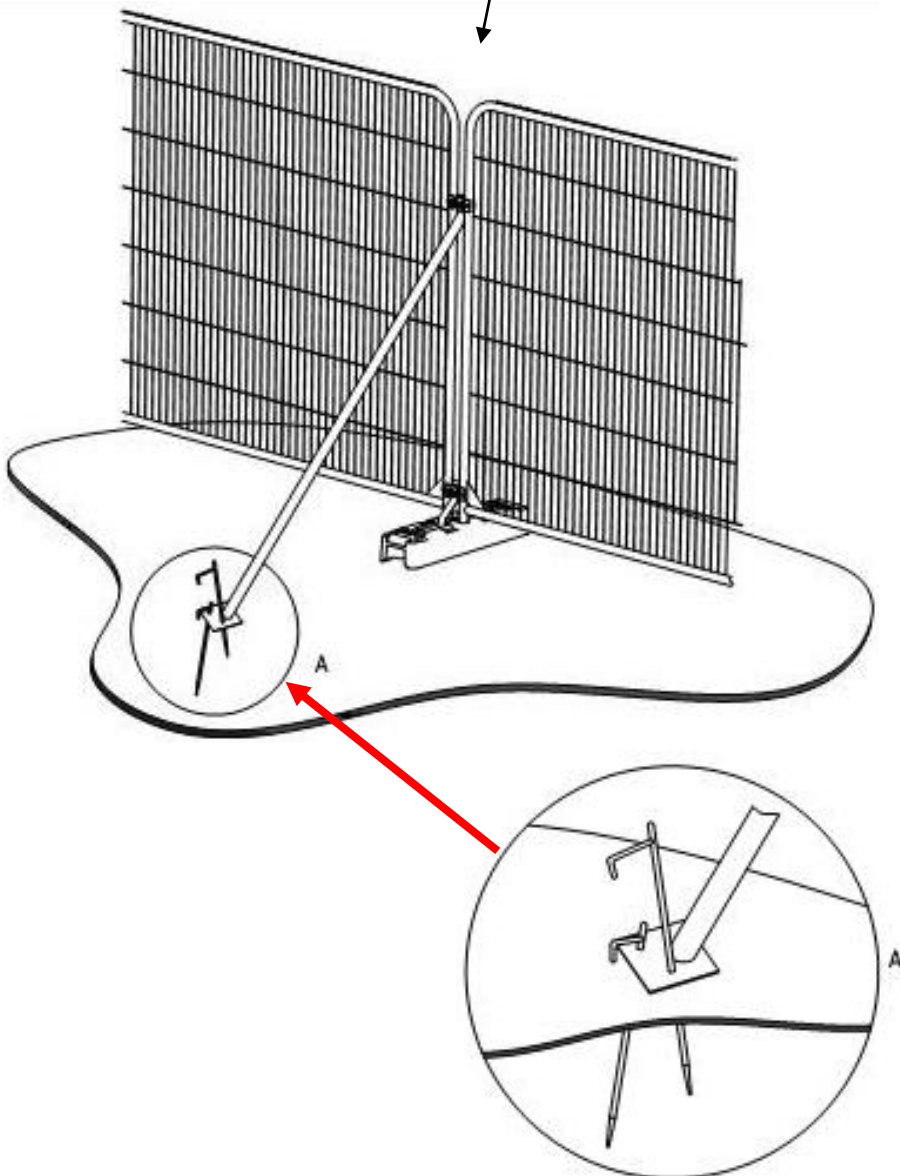
**Vertical protective fence: location on plan:**

Lightweight: in situ for < 3 months or constrained site-

**Heras panels joined by two clamps, on feet, with pegged strut on each panel.**

Apply signs at maxm 20m spacing:

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





Appendix IV

**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.

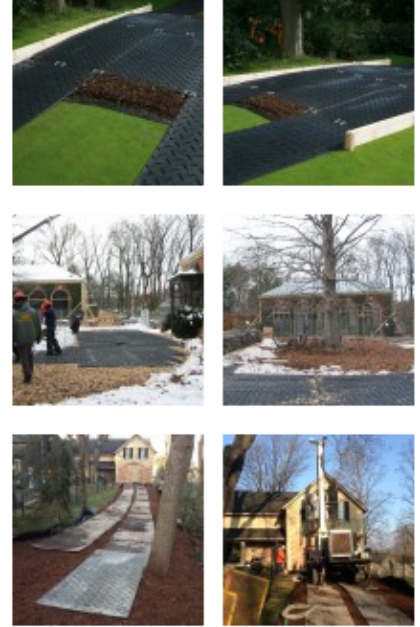
### Ground-Guards Tree Root Protection

#### 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 V

### Two Examples of 3-dimensional cellular confinement build up for minimal-dig roading or parking.

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.

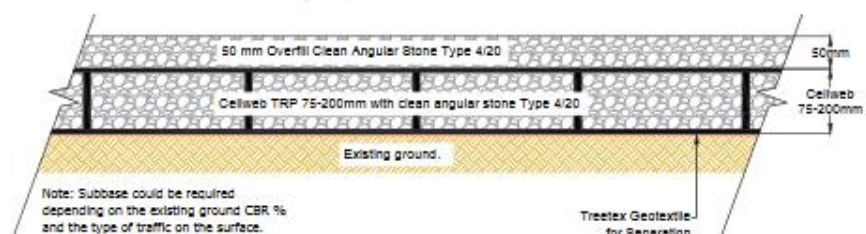
**Cellweb® 3D Cellular Confinement.** The Cellweb® is installed on top of the Treetex™ layer. This is fixed to the ground using ten steel J pins per panel. The panels can be cut to the required shape and adjoining panels can be connected using heavy duty staples or cell ties.

**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](http://www.geosyn.co.uk).

#### Indicative Cellweb with overfill



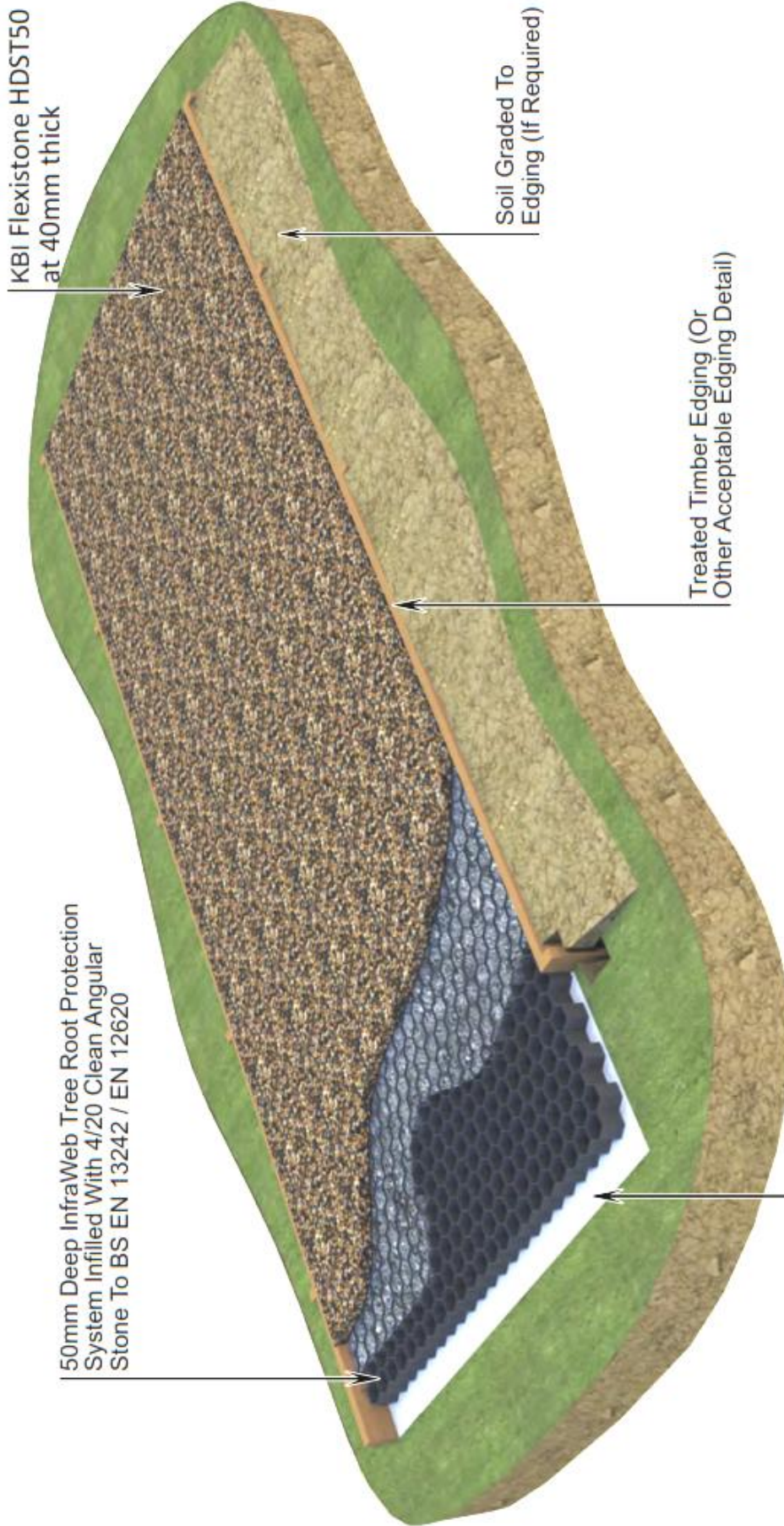
Web: [www.geosyn.co.uk](http://www.geosyn.co.uk) | Tel: 01455 617139  
 Fax: 01455 617140 | Email: [Sales@geosyn.co.uk](mailto:Sales@geosyn.co.uk)



**Geosynthetics**  
 Engineered Solutions



**InfraWeb TRP 50 Section - Tree Root Protection c/w Flexistone HDST50 at 40mm thick for pedestrian and cycleway use only**



 <p><b>KBI</b> Sustainable Porous Paving Solutions</p>	<p>KBI Longfields Court Middlewoods Way Wharmcliffe Business Park Barnsley South Yorkshire S71 3GN +44 (0) 1422 242880 <a href="http://www.kbiuk.co.uk">http://www.kbiuk.co.uk</a></p>	<p><b>InfraWeb TRP 50 Section - Tree Root Protection c/w Flexistone HDST50 at 40mm thick for pedestrian and cycleway use only</b></p>	<p>Date: 29/12/2016</p>
<p>Drawn By: NLG Design</p>		<p>Revision: A</p>	<p>Drawing Number: TRP50HDST50</p>

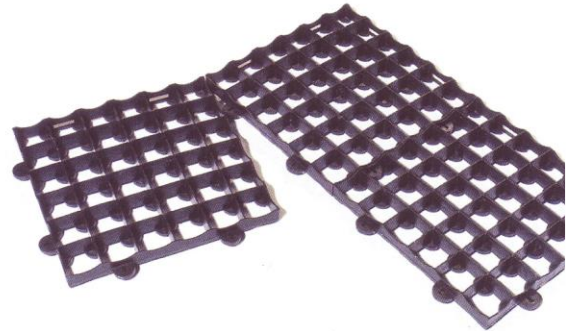
**Trays for strengthening gravelled or grassed areas.  
Or for surfacing porous, minimal-dig, build-up.**

# 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



## Appendix VI

# 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/S<sup>2</sup>

Y axis = 0.0M/S<sup>2</sup>

Z axis = 0.0M/S<sup>2</sup>

*Hand/arm vibration = 0.0M/S<sup>2</sup>*

### 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*



- Non-Conducting Barrel**  
Independently certified safe for 100,000 Volts/12" Barrel
- Large Deflector**  
protects operator from scatter of dirt and debris
- Non-Sparking Nozzle**  
allows safe use around leaking gas lines
- Polymer Trigger**  
reduces operator fatigue
- Unlike the Competition,**  
the Soil Pick maintains a cool temperature
- Pressure Gauges**  
ensure maximum performance

**MBW UK Ltd.**  
Units 2 & 3 Cochrane Street • Bolton BL3 6BN • England UK  
Ph: 44 (0) 1204 387784 • Fax: 44 (0) 1204 387797  
E-mail: mbwuk@btinternet.com • Website: www.mbw.com

 1-800-878-5287

## Appendix VII

### - B J UNWIN FORESTRY CONSULTANCY Ltd. -

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](mailto: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, CEnv.**

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

<b>From:</b>	<b>Jim Unwin</b>	<b>To:</b>	<b>Prospective Client</b>
<b>Date:</b>	<b>Aug 2023</b>	<b>No. of pages:</b>	<b>2</b>
<b>Subject:</b>	<b>Professional CV</b>		

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 / adviser to a range of clients listed below.

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

A secretary/ plan technician assists; plus 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 1<sup>st</sup> 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, from 2004 to May 2021.**

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 were successfully assessed by Safety Management Advisory Services (SMAS) for many years as meeting CDM Regs 2015 Core Criteria Stage 1, as a **Worksafe Consultant No. 75950**. expired 09/2020. Not renewed.

CITB *Health, Safety & Environment Test for Managers & Professionals* passed 22/01/2015.

First-aid at work June 2013.

DBS Basic Certificate P0003GX9B7C dated 28<sup>th</sup> Nov 2022 Certificate 001100238741.

ROSPA Routine Playground Inspection Certificate valid from 20/10/2022 to 20/10/2025.



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 2008 - 2021.
Planning Inspectorate (PINS) & Dept for Communities and Local Government. 2000-2017.	<b>Arboricultural Inspecting Officer</b> 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 <b>Arboricultural Inspector, determining TPO appeals and High Hedge appeals.</b> <b>All non-salaried inspectors released in 2017.</b>
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 Cornwall, 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.	1988-2018 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 VIII

Constraints plan :-

- **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**

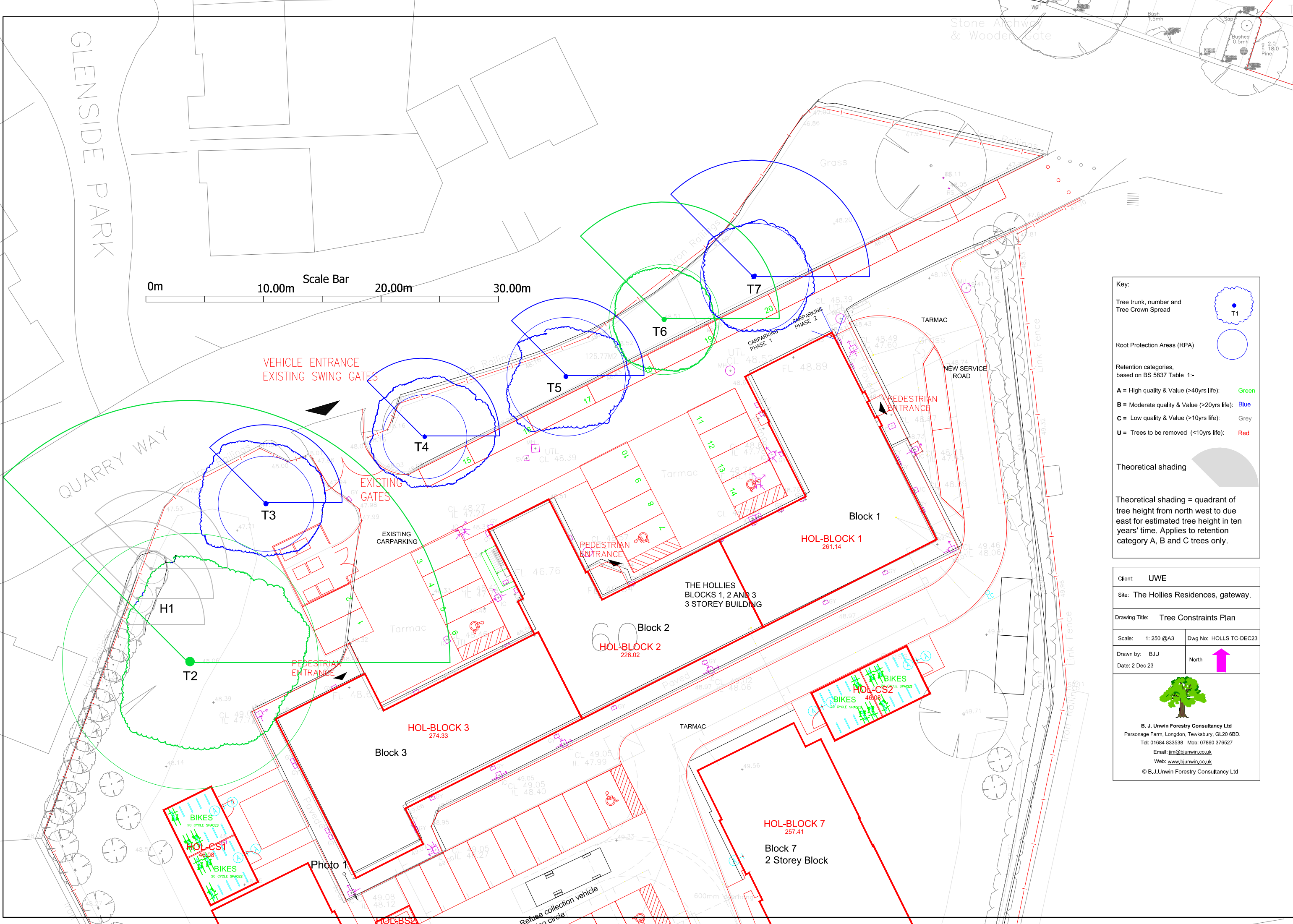
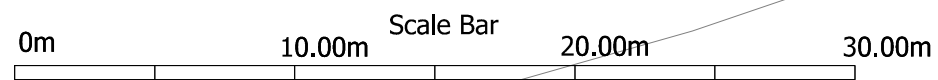
= quadrant of tree height in ten years' time from north west (mid-morning) to due east (evening).

This is a shadow pattern for 1 x tree height from 10.00-18.00hrs from May to September.

***Insert plans here in paper copy of report:-***

GLENSIDE PARK

Stone Archway & Wooden Gate



**Key:**

- Tree trunk, number and Tree Crown Spread
- Root Protection Areas (RPA)
- 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
- Theoretical shading

Theoretical shading = quadrant of tree height from north west to due east for estimated tree height in ten years' time. Applies to retention category A, B and C trees only.

Client: UWE  
 Site: The Hollies Residences, gateway.  
 Drawing Title: Tree Constraints Plan  
 Scale: 1: 250 @A3 Dwg No: HOLLIS TC-DEC23  
 Drawn by: BJU Date: 2 Dec 23 North

B. J. Unwin Forestry Consultancy Ltd  
 Parsonage Farm, London, Tewksbury, GL20 6BD.  
 Tel: 01684 833538 Mob: 07860 376527  
 Email: jim@bjunwin.co.uk  
 Web: www.bjunwin.co.uk  
 © B.J.Unwin Forestry Consultancy Ltd

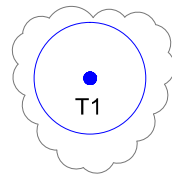
## **Appendix IX**

### **Tree retention and Tree Protection Plan.**

*Insert plans here in paper copy of report:-*

**Key:**

Tree trunk, number, crown & Root Protection Areas (RPA)



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**

Small trees:

Tree species, dbh = **Ash,400,**  
 comments, retention category = **Thin crown,C**

Tree Protection Fence



Construction exclusion zone

**CEZ**

Tree removed for development



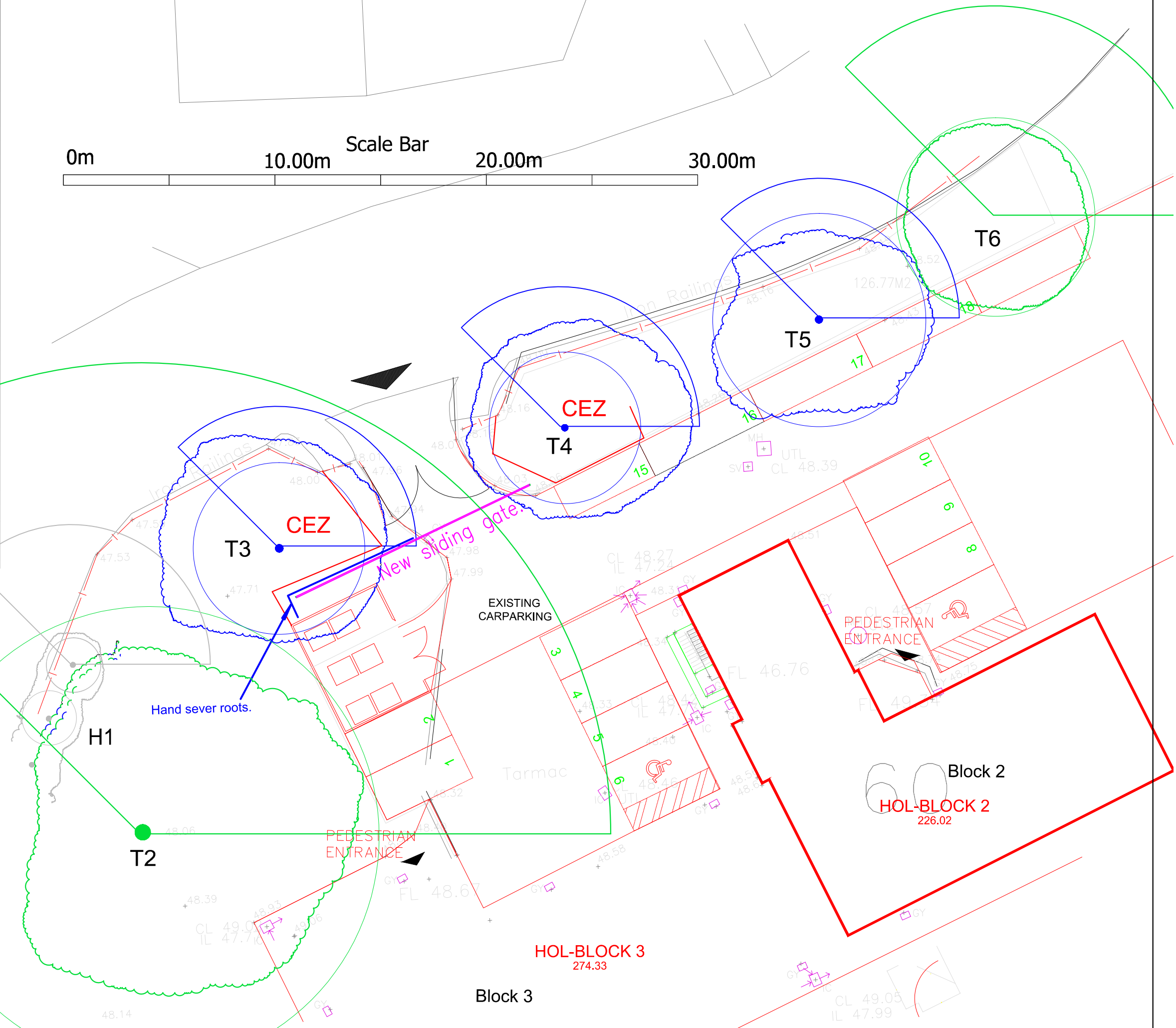
Hand sever roots.



**Note: New underground services may require changes to this tree retention & protection plan.**



<b>UWE</b>	
Site: <b>The Hollies Residences, gateway.</b>	
Drawing Title: <b>Tree PROTECTION Plan</b>	
Scale: 1: 200 @A3	Dwg No: <b>HOLLS TC-DEC23</b>
Drawn by: <b>BJU</b>	North
Date: 2 Dec 23	
<b>B. J. Unwin Forestry Consultancy Ltd</b> Parsonage Farm, Longdon, Tewksbury, GL20 6BD. Tel: 01684 833538 Mob: 07860 376527 Email: <a href="mailto:jim@bjunwin.co.uk">jim@bjunwin.co.uk</a> Web: <a href="http://www.bjunwin.co.uk">www.bjunwin.co.uk</a> © B.J.Unwin Forestry Consultancy Ltd	



END.