79 CAMDEN ROAD
& 86-100 ST PANCRAS WAY

arboricultural report

November 2013

by B J UNWIN FORESTRY CONSULTANCY

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Site: **79 Camden Road & 86-100 St. Pancras Way,**
London, N1 9EU.

Subject: **BS5837**
Tree Survey
of site for proposed re-development including:-

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

Surveyor: Jim Unwin Date: Dec 2012. + Update: Nov 2013

Notes:

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

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Visual Tree Assessment

Camden Road - Contents

1. Instruction

1.1 Previously Adrian Power, and now Jamie Gillingham, Technical Coordinators for Barratt West London, is working on re-development of No.79 Camden Road & 96-100 St.Pancras Way. They have asked B J Unwin Forestry Consultancy to advise on tree issues on this site, subject to quote.

1.2 The local authority (Camden Council) will require a tree impact assessment and tree protection method statement as part of a planning application. They may require mitigation by new planting for any trees lost as part of re-development of the site.

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

2. Objectives of Tree Survey

2.1 Objectives of Tree Survey:-

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

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

Stage 2 has several sequential phases:-

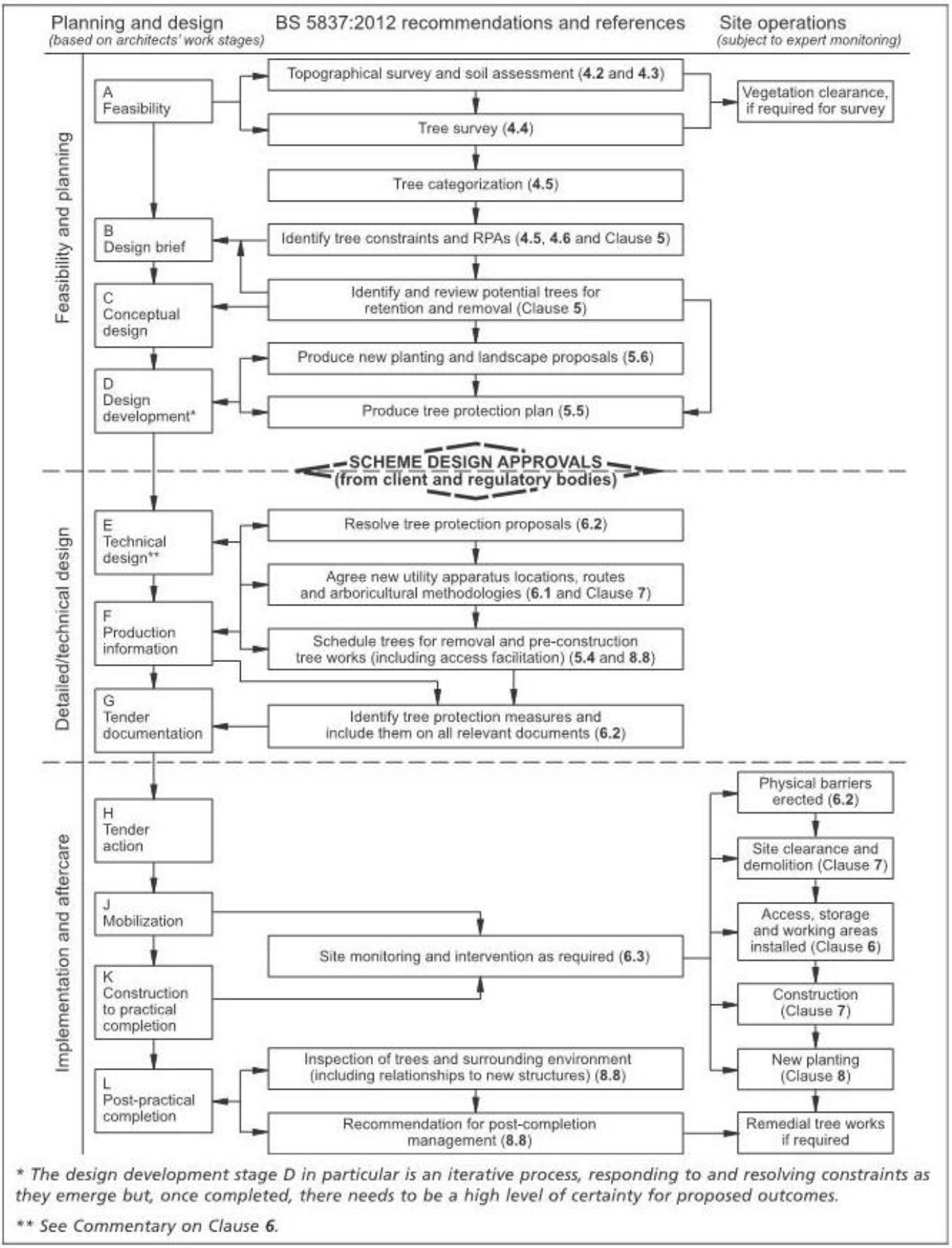
- **Design review to test proposed layout.**
- **Arboricultural Implications Assessment (AIS).**
- **Arboricultural Method Statement (AMS) & Tree Protection Plan (TPP).**
- **Discharging planning conditions.**
- **Implementation and supervision of tree work and protective measures.**

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

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

2.2 We have used a topographic survey by **C.D Surveys BAR/1211020/T dated Dec 2012** for constraints plans. Protection Plan is based on **Formation Architects' 4998-20-102 Rev B. Proposed Layout Ground-floor plan** (reproduced in the appendices).

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



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

*** See Commentary on Clause 6.*

3. Survey

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

3.2 This survey was carried out on 19th November by Jim Unwin (Professional CV in appendices) with an assistant.

4. Results of Survey

4.1 Physical

4.1.1 Survey Site details:

The survey site is a rectangular corner plot about 83m x 50m in size. It comprises a large building set back from St Pancras Way behind a roadside wall and service/parking area. Part of the wide footway to the south east may belong to the property.

The site has a very slight fall from north to south from about 31m aod to 30m aod, but a ramp down drops to a basement at 28m inside the southern corner.

Underlying Solid geology from Envirocheck (Desk study by Hydrock) is London Clay. There are sand & gravel deposits recoreded nearly a kilometre away.

Therefore, the site's subsoil texture is not confirmed.

4.1.2 Recent landscape maintenance:

The site and its surroundings is adequately maintained.

4.2 Landscape Setting of the Site

4.2.1 Photos:

Please refer to photos in Appendix III.

4.2.2 Land uses beyond the site:-

To the south west and south east are public footways then busy arterial roads (St.Pancras Way & Camden Road).

To north east is a narrow and quiet road (Rochester Place).

Close to the north west is No.102: offices of *Optomen* and *One potato, two potato*.

4.2.3 Prominence of the site in the local landscape:-

The site sits on a street corner within a very busy part of Central London, at a meeting point of major roads: it is locally very prominent.

However, there are no long views of the site.

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

4.3.1 Trees on site:-

- The largest tree is London plane T1 set towards the western corner. It has been crown reduced or high pollarded more than once. It is pushing out adjacent kerbing/low wall. It has been brought to our attention by Robert Butcher, LBC Arboricultural Officer that plane T1 exhibited fruit bodies of the white rot fungus *Meripilus giganteus*, which is known to embrittle the base of a tree and its main roots. See photo 3. This was the reason for the last crown reduction. However, the tree is still tall with a high centre of effort for wind to act upon. If retained, more-drastic pruning is required.
- Younger planes T9 & T10 mark the roadside corner of the property.
- Three half-grown limes T12-T14 stand in the wide Camden Road footway. There may not be space for all three to grow large.

4.3.2 Trees nearby:-

- The locality has a reasonable mixed tree population along roads and fronting properties.
- Bernard Shaw Court opposite has two huge planes T4 & T7 which really need some size-control pruning.
- Fronting the same property are five smaller trees.
- Limes T15 & T16 are the closest of several more running away from site in gardens of Camden Road.

4.3.3 Visual Amenity of Trees

- All local trees are set on, or close to, busy streets. All provide high amenity value.

4.4 Detailed Tree Descriptions

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

Age class is described as:-

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

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

Remaining Safe Useful Life Expectancy: SULE
Prediction of safe useful years of life **in its location**, estimated as:-
<5 years, <10 years, 10-20 years, 20-40 years, >40 years.

Retention *categories*, based on BS 5837 Section 4.3, are:-
Trees to Retain:
A = *High quality or value >40yrs safe life*: Light Green*
B = *Moderate quality or value >20yrs safe life*: Mid Blue*
C = *Low quality or value >10yrs safe life or young trees <150mm stem diameter*: Grey*
Trees to Remove:
U = *<10yrs safe life or should be removed for sound arboricultural reasons*: Dark Red*
(*Colour marking on relevant Tree plan)

Sub-category for retention (can be more than one category for a tree):-
1 = Arboricultural Value
2 = Landscape Value
3 = Cultural and/or Habitat Conservation Value

***BS 5837:2005 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 **Camden Road - BS5837 pre-development tree survey – December 2012**

No	Species	Dbh (stem diameter @ 1.5m ht) Rounded down to nearest 10mm.	Total height m. Ht to base of crown. m. Est Ht in 10 yrs.	Crown radii m. North east South east South west North west	Age class	Cond-ition	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. M	WORK excluding Development
T1	London plane	103	19 8 20	6 5.5 6 7	M	F	20-40	8.9m from building. High pollarded several times. Meripilus basal decay.	A1	12.3	Reduce crown by 3m off height and 1.5-2m off radii. Maintain as high pollard.
T2	Norway maple	30	10 3 11	4.5 3.5 5 5.5	Em	P/F	10-20	Off-site in Bernard Shaw Court in broken raised planter.	C1	3.6	
T3	Norway maple	35	11 3 13	5 4.5 5 6	Em	F	10-20	Off-site in Bernard Shaw Court in raised planter.	B2	4.2	
T4	London plane	104	23 5 23	13 11 6 10	M	F	20-40 **	Off-site in Bernard Shaw Court in raised planter. Too great spread over road. **with management	A1	12.4	Recommend crown reduce by 5m off height and 6m of north east side, 4m off north west and south east.

T5	Lime	42	11 2 12	3.5 4.5 3 2	M	F	20-40	Off-site in Bernard Shaw Court. Pollarded at 3m height, also high pollarded.	B2	5.1	
T6	Ornamental ash	22	9 2.5 11	4.5 2.5 3 4.5	Sm	F	20-40	Off-site in Bernard Shaw Court in raised planter.	C1	2.7	
T7	London plane	116	23 6 23	11 12 6.5 9.5	M	F	20-40	Off-site in Bernard Shaw Court in raised planter.	A1	13.9	
T8	Lime	37	11 5 12	3.5 4 4 4.5	Em	F	10-20	Street tree.	B1	4.5	
T9	London plane	44	13 5 15	3.5 9 8 7.5	Em	F	>40	Street tree on corner. Lop-sided canopy to south east and south west.	A1	5.3	
T10	London plane	40	13 6 15	6.5 6 4 4.5	Em	P	>40	5m from front of existing building.	B1	4.8	
T11	Lime	33	9 3 11	3 4.5 4.5 3	Sm	F	20-40	Has been pruned back from the building.	B1	4.0	
T12	Lime	23	10 2 12	4 4.5 3.5 3	Sm	F	>40	One of three limes planted in footway, 3-4m apart.	B2	2.8	
T13	Lime	17	10 2 12	4 4.5 3.5 3	Sm	F	20-40	One of three limes planted in footway, 3-4m apart. Central tree slender.	B2	2.1	
T14	Lime	26	10 2 12	4 4.5 3.5 3	Sm	F	20-40	One of three limes planted in footway, 3-4m apart. North east tree has poor form.	B2	3.2	

T15	**Lime**	**36**	**12 2.5 13**	**3 2 4 4**	**Em**	**F**	**10-20**	**In front garden of No. 81 Camden Road.**	**B2**	**4.4**	
T16	**Lime**	**35**	**12 2.5 13**	**2 4 4 2**	**Em**	**F**	**10-20**	**Ex-pollards now high pollarded.**	**B2**	**4.2**	
T17	**Goat willow**	**35**	**9 3 9.5**	**4 3 5.5 7**	**M**	**P/F**	**10-20**	**Off-site in garden of No. 15 Wilmot Place.**	**C1**	**4.2**	

End of table

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

5.1 Proposed Development

5.1.1 The proposal is to demolish the existing building, and erect a residential building ranging from five to seven storeys in height, with a lower-ground floor set at basement level.

5.1.2 The proposal pulls forward the building line to the site boundary along St. Pancras Way and Camden Road. Open space is provided in central courtyards.

5.2 Tree Constraints and Impacts.

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

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

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

5.3 Physical contact of above-ground parts of trees.

5.3.1 General:-

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

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

5.3.2 Specific above-ground impacts:-

- T1 is cut by a light well. It is anyway decayed, so remove and replant north west.
- T9-T14 are located 2.7m to 4.3m from the building. Severe pruning is needed on the northwest side of each crown. High-pollarding of all the trees is required to restore any balance to the crowns.

5.4 Below-ground root spread.

5.4.1 General:-

BS5837 defines a tree's Root Protection Area as a disc of soil 1m deep required to maintain long-term health a full-canopied tree of a given stem size, usually 12 x stem diameter. We show it as an idealised circle. Rooting areas are never symmetrical, but ideally there should be no ground disturbance within the RPA zone. At the discretion of an arboriculturalist, the RPA can be

offset if work is proposed on one side only and the tree can root in the opposite direction. It is not appropriate to rely on the reduced RPA where potential disturbance extends halfway or more around the tree.

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

5.4.2 Specific Rootzone Impacts:-

- Plane T1 has a high proportion of main roots removed. Remove and replant north west
- Planes T9 & T10 and limes T11-T14 are within 0.9m to 2m from the proposed light well. Careful root pruning is needed, plus high-pollarding to avoid de-stabilisation.

5.5 Shading.

5.5.1 General:-

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

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

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

5.5.2 Specific Shading Impacts:-

- When in leaf T9-T14, due to proximity, will intercept sunlight and daylight from reaching adjacent windows. However, Camden Road is a busy street, so some mutual screening provided between windows and road is a benefit. These trees will need regular pruning to control regrowth.

5.6 Over-bearing and Falling material.

5.6.1 General:-

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

5.6.2 Specific Impacts:-

- T9-T14 will shed leaves etc. But dominance will be minimal following high-pollarding.

5.7 Subsidence/heave & root growth.

5.7.1 The geology map suggests shrinkable clay, which may or may not be overlain by non-shrinkable sand & gravel. Engineer to design foundations near trees, as per NHBC Chapter 4.2 or other design guide relating to trees; following detailed site investigation.

However, foundation depth is likely to be well below rootzone influence (about 3m).

5.8 Amenity value.

5.8.1 General:-

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

5.8.2 Specific amenity Impacts:-

- Material loss of visual amenity when T1 goes, and T9-T14 are heavily pruned.

6. DRAFT Arboricultural Method Statement in sequential order for proposed development at St.Pancras Way / Camden Road site.

6.1 Supervision

6.1.1 Trees cannot be protected unless the developer is committed to their protection.
A site meeting **before work starts** between Council Tree Officer, site manager/architect, retained arboriculturalist / landscape architect may be required to agree locations, and feasibility, of tree protection fencing and tree retention. This can be conditioned as part of a planning permission.

6.1.2 The local authority will not require follow-up inspections on this limited site, because impacts on retained trees are not significant.

6.2 Tree Management

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

6.2.1 Tree Work prior to ground work:-

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

No	Species	RPA radius m.	Tree work: ignoring development.	Tree work: *for proposed development* & landscaping.
T1	**London plane**	**12.3**	**Reduce crown by 3m off height and 1.5-2m off radii. Maintain as high pollard.**	***Remove & replant different species about 4m north west.***
T2	**Norway maple**	**3.6**		
T3	**Norway maple**	**4.2**		

T4	**London plane**	**12.4**	**Recommend crown reduce by 5m off height and 6m of north east side, 4m off north west and south east.**	**SAME: Recommend crown reduce by 5m off height and 6m of north east side, 4m off north west and south east.**
T5	**Lime**	**5.1**		
T6	**Ornamental ash**	**2.7**		
T7	**London plane**	**13.9**		
T8	**Lime**	**4.5**		
T9	**London plane**	**5.3**		***Prune to provide at least 1.5m clearance from building and re-shape to balance.***
T10	**London plane**	**4.8**		***Prune to provide at least 1.5m clearance from building and re-shape to balance.***
T11	**Lime**	**4.0**		***Prune to provide at least 1.5m clearance from building and re-shape to balance.***
T12	**Lime**	**2.8**		***Prune to provide at least 1.5m clearance from building and re-shape to balance.***
T13	**Lime**	**2.1**		***Prune to provide at least 1.5m clearance from building and re-shape to balance.***
T14	**Lime**	**3.2**		***Prune to provide at least 1.5m clearance from building and re-shape to balance.***
T15	**Lime**	**4.4**		
T16	**Lime**	**4.2**		
T17	**Goat willow**	**4.2**		

End of table

6.2.2 Treework informatives:-

6.2.2.1 Disturbance to wildlife.

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

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

6.2.2.2 Permission

Trees may be protected by a TPO, and could lie within a Conservation Area.

Trees may be owned by third-parties.

Trees may be protected by planning conditions.

Therefore, a contractor must satisfy himself that all necessary permissions from the local planning authority or tree owners are in place before touching trees.

6.2.2.3 Quality of Tree Work

All off-ground tree work should be done by insured tree surgeon with certificates in

aerial chainsaw use (NPTC/Lantra CS38 and CS39, and if possible CS40), and working to BS3998:2010.
Stumps can be left to shoot again, ground out, or grubbed out, depending on location.

Treework following construction (see 6.10 below……)

6.3 Tree Protection

6.3.1 Requirement

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

6.3.2 Vertical Tree Protection

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

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

6.3.2.3 Within the fenced off Construction Exclusion Zone: **CEZ** 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 within RPAs:-

6.3.3.1 IF work is required to be closer than the all-round protection zone, **as required around T9-T14**, 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.

6.3.3.2 Four obvious options for ground protection would be:-

- Retain existing paved surfacing, protect this as required.
- Temporary ground protection plates such as aluminium “Eve Trakway” or plastic interlocking-plate ground protection, both on 150mm depth of woodchip or bark, shown in Appendix VII.
- A layer of woven geo-textile under minimum 250mm depth of graded aggregate which is lifted after work.
- Butted scaffold boards or 22mm plyboard laid on bearers on 100mm depth woodchip or bark mulch (pedestrian only).

6.4 Construction Access.

6.4.1 General points:-

- No plant or machinery to enter RPAs without ground protection.
- Any vehicle access within RPAs requires temporary ground protection as detailed in para 6.3.3 above.

6.4.2 The site is very constrained Therefore, consider moving back protection fences and installing some ground protection, to increase working area.

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

6.5 Demolition within RPAs:-

6.5.1 To excavate light wells north west of T9-T14.

- High pollard trees.
- Excavate along line of rear of retaining wall (piles see 6.6 below) by hand, working around roots to 1m depth.
- Sever all roots cleanly with sharp hand saw or chainsaw.
- Paint all cut ends immediately with bituminous paint to reduce desiccation.
- Install piled wall for light wells.
- Backfill around roots with structural soil to resist compaction: approx. 92% coarse sand, 3% clay, 5% organic matter. Consolidate soil with whacker plate.

6.6 Foundations within RPAs:-

6.6.1 To build light wells by T9-T14:-

- WE WOULD RECOMMEND DRIVEN SHEET PILING. If sheet piling is used, no prior root severance is required below 1m depth, because piles guillotine any roots.

6.7 Drainage.

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

6.7.2 Foul Drainage:
Keep away from trees.

6.7.3 Sustainable Urban Drainage System:
If a SUDS scheme is implemented to reduce the load on local main drainage, it must not add to the soil water in trees' root zones.

6.8 Service Trenches.

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

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

- Hand digging* or trench-less systems must be used.

*Use an air-spade to reveal roots (Appendix VIII).

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

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

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

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

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

See locations on Tree Protection plan.

6.9.2 No obvious area of special construction is required here, at outline stage. Appendix VIII shows examples of cellular ground reinforcement (Cellweb etc) to create porous pavements in case path or paving work is needed closer to trees.

6.10 Tree work following construction

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

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

6.11 New Landscaping

6.11.1 The site is compact and city centre, so contains few trees.

6.11.2 Landscape architect will incorporate some sort of green landscaping where it is possible.

6.11.3 A new London plane to replace T1 would be desirable, but this would have to grow west to avoid the new building. A slender tree such as a dawn redwood might be preferable. We would strongly recommend a bioretention system such as 'silvacell' to allow an adequate volume of

uncompacted soil to be made available to T1's replacement under the site and under the adjacent footway: ideally to produce 28m^3 no deeper than 1.2m, ie 4.5m x 5m in size by 1.2m deep.

7.0 Conclusions

7.1 Proposed re-development at St.Pancras Way / Camden Road junction requires one tree's removal, but heavy pruning of six other trees.

7.2 Retained trees can be protected by careful construction methods.

7.3 This city-centre site can be improved by some new tree, shrub and hedge planting, wherever there is space.

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

Yours sincerely,

B. J. Unwin Forestry Consultancy

References:

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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.
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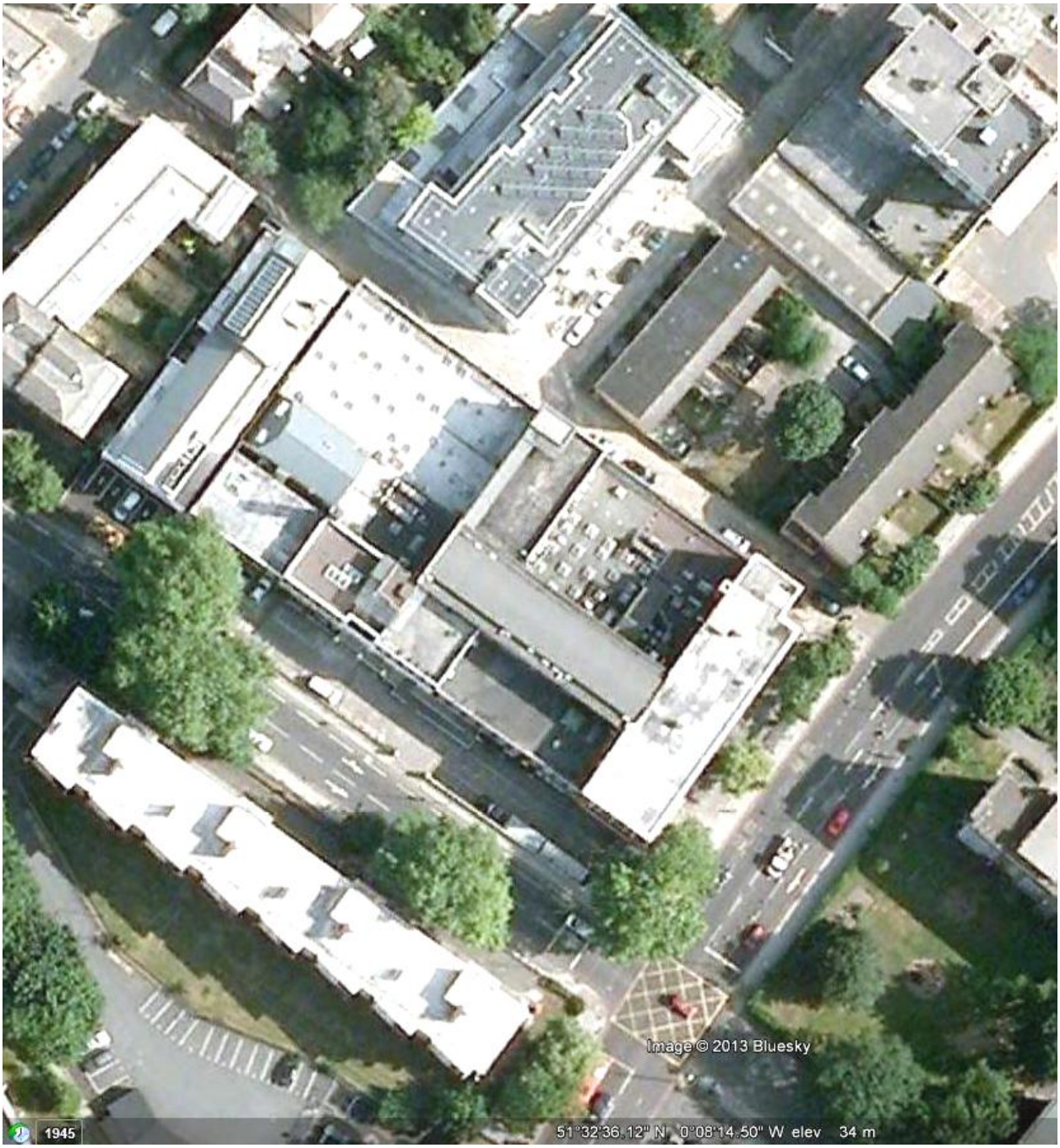
"*Up by Roots*". James Urban. ISA, 2008.

Appendix I

Site location

Aerial photo.
Taken mid-summer early morning.



Appendix II

Constraints plans :-

- **Tree Plan**

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

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

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

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

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

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

- **Root Protection Areas Plan**

RPA = circles.
See Tree Table for dimensions.

and

- **Theoretical Shading Plan**

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

Separate plans are not included in pdf format of report.

Insert plans here in paper copy of report:-

Appendix III

8 x Photos:-

P1: **View south east to plane T1. Note crown reduction.**
Planes etc in Bernard Shaw House on right. Note growth across width of road.

P2 (left): **View north east to base of T1 pushed out boundary wall.**
P3 (right): **Close up in Sept 2010 of *Meripilus* fruit body.**

P4: **View south east showing ramp down to basement 5m from plane T9.**

P5: View north to planes T9 & T10 on corner. Lime T8 on left. Limes T12 etc on right.

P6: View south west to planes T10 & T9.

P7: View north east to limes T12-T14.

P8: View south east along Rochester Place. Off-site willow T17 overhangs wall.

Appendix IV

Proposed development Formation Architects 4998-20-102 Rev B.
Tree retention and new planting is indicative here.

Appendix V

Tree retention and Tree Protection Plan

Separate plan not included in pdf format of report.

Insert plans here in paper copy of report:-

Appendix VI

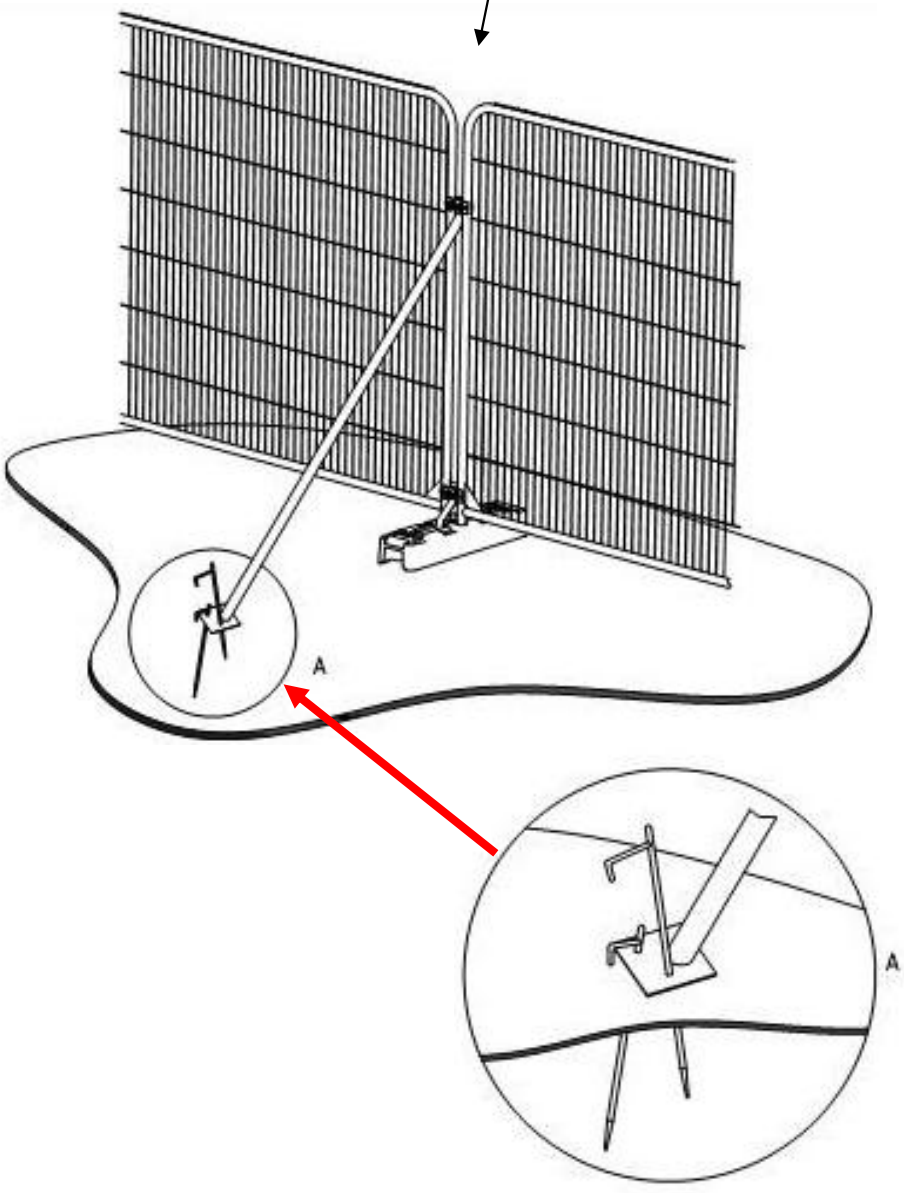
Vertical Tree Protection Fencing, from BS5837.

Heras panels on rubber feet, pinned braces.

Vertical protective fence: location on plan:

Apply signs at 20m spacing:

TREE PROTECTION - Construction Exclusion Zone. NO ACCESS



Appendix VII

Horizontal Ground Protection x 2 examples

Example of aluminium temporary ground protection.

EVE TRAKWAY

Roadways - Medium Duty Trakpanel

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

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

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

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

Other Roadways products
- Heavy Duty Trakpanel
- LD20

- Roadway Ramps
- Multi-Directional Trakpanel

Example of plastic temporary ground protection.

Appendix VIII

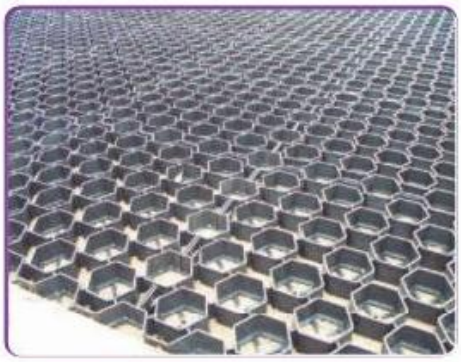
Shallow trays for strengthening gravelled or grassed areas.

GRB Plus

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

Introduction:

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



Specification:

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

Application:

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

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

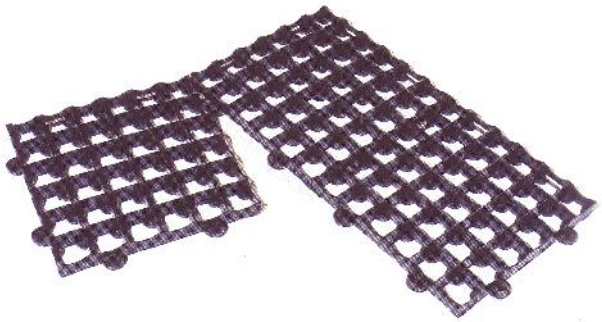
Slightly deeper (50mm or 80mm trays for strengthening gravelled or grassed areas.

DuoBlock

Grass Protection System



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



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

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

Applications:

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

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

Benefits:

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

NEXT DAY DELIVERY from stock

Deeper Cellweb 3-D grid for strengthening tracks.

Access road for the National Lake District Parks Authority.

Site before construction pictured above.

CellWeb during installation.

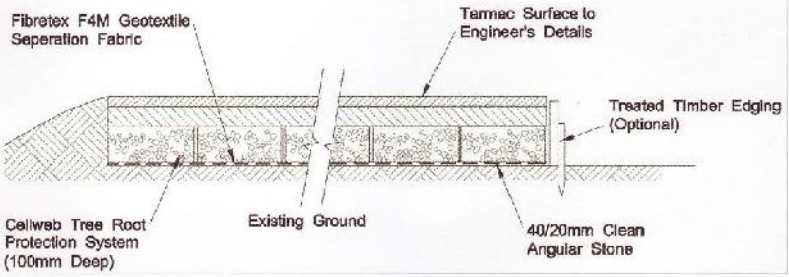
Final surfacing.

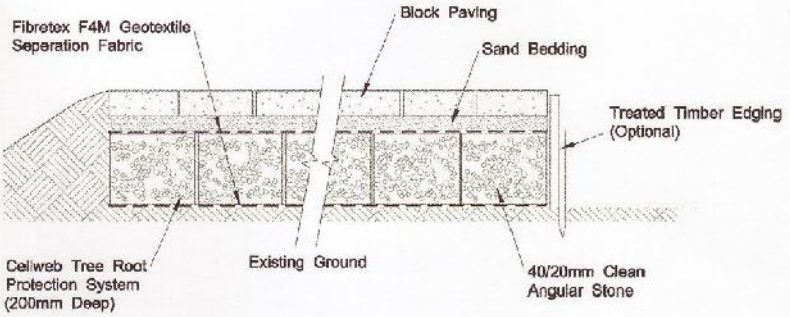
Final surfacing

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

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

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





butor of geosynthetic materials in the UK

Design service

Onsite support

See all products online at geosyn.co.uk

GEOSYNTHETICS

Appendix IX

Example of Air-spade.

HANDLE VIBRATION TEST

Product type – MBW Soil Pick SP125

Manufacturer of testing apparatus – Castle

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

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

Hand/arm vibration = 0.0M/S2

TREE CARE

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

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

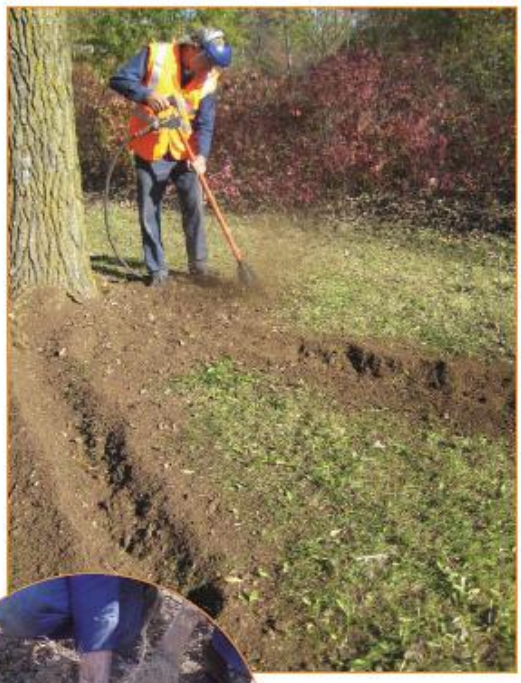
Aeration & Excavation

Root Locating for Utility Line Installation or Pruning

Investigating Root Structure and Damage

Transplanting or Bare Rooting

Reducing Soil Compaction



Appendix X

B J UNWIN FORESTRY CONSULTANCY,

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

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

From:	**Jim Unwin**	*To:*	**Prospective Client**
Date:	**September 2013**	*No. of pages:*	**2**
Subject:	**Professional CV**		

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

Insurance:-

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

Personnel:-

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

He works with one self-employed Level-3 arboriculturalist of 23 years' experience (**Jasper Fulford-Dobson** Professional Member of the Arboricultural Association - Associate Member of the Institute of Chartered Foresters - Professional member of the International Society of Arboriculture - Technicians Certificate (ArborA) 2005, now regarded as NQF "level 4" - I Tree Inspection Certificate (LANTRA) 2013, plus a secretary/technician; calling in extra help as required (eg ecologist or arboricultural assistant with TechCert standard + Professional Tree Inspection Certificate (LANTRA) 2013).

On bigger projects he regularly works as a part of a multi-disciplinary team.

Current BJUFC qualifications are:-

BSc Forestry Hons 1st Class, Aberdeen 1981.
Chartered Forester, 1986.
Fellow of the Arboricultural Association, 1995.
Licensed Subsidence Risk Assessor, 1997-2001 (scheme closed in 2001).
Completed Training in September 2002 to Prepare Native Woodland Plans for CCW and FC in Wales.
Arboricultural Association Registered Consultant, 2004.
LANTRA certificate for Arboriculture and Bats, BJU in 2005.
Examined and approved to submit Welsh WGS as Management Planner and PAWS Assessor, 2006.
Joined Utilities Vendor DataBase, Supplier No: 88101 in Feb 2006 (left 2010).
Training and Certification in basic CAD operation 2006.
Chartered Environmentalist April 2008.
Woodfuel Production and Supply : LANTRA Certificate of Training Dec 2008.
Training in CAVAT amenity tree asset valuation October 2010.
SPA Quarry Safety Passport, current: BJU & JF-D.

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

Current clients and typical work include:-

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

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